Canada Parliament
Sessional Papers

# SESSIONAL PAPERS

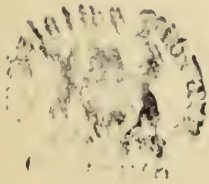
VOLUME 20

SIXTH SESSION OF THE TWELFTH PARLIAMENT

OF THE

DOMINION OF CANADA

SESSION 1916



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**65.** Detailed Statement of all remissions and refunds of the tolls or duties for the fiscal year ending 31st March, 1915. Presented by Hon. Mr. Blondin, February 2, 1916. *Not printed.*

**66.** Return to an Order of the House of the 8th March, 1915, for a return showing the quantity of Oliver equipments purchased since 1st August, 1914, the persons from whom they were purchased, the price paid to each contractor, and the dates of their delivery. Also a copy of all complaints received from any quarter in regard to the equipment, and of any action, departmental or otherwise, taken in regard to the same. Presented 3rd February, 1916.—*Mr. Macdonald*.. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..*Not printed.*

**67.** Return to an Order of the House of the 1st March, 1915, for a return showing the amount of dredging done in the county of Inverness since 1896, up to the present; where such dredging was done, the quantity of dredging done in each place, and dates on which such dredging was done, also the cost in each case of such dredging. Presented February 3, 1916.—*Mr. Chisholm (Inverness)*.. .. .. .. .. .. .. .. .. .. .. ..*Not printed.*

**68.** Return to an Order of the House of the 17th March, 1915, for a copy of all reports, correspondence and other communications between the Department of Customs and Auguste Desjardins, of St. Denis de Kamouraska, since his appointment as a preventive officer of that Department. Presented by Hon. Mr. Reid, February 3, 1916.—*Mr Lapointe (Kamouraska)*.. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..*Not printed.*

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**70.** Annual return respecting Trade Unions under Chapter 125, R.S.C., 1906. Presented by Hon. Mr. Blondin, February 3, 1916.. .. .. .. .. .. .. .. .. .. .. .. .. .. ..*Not printed.*

**71.** Return to an Order of the House of the 22nd March, 1915, for a copy of all letters, despatches, correspondence, petitions, recommendations, tenders, etc., relating to the purchase of the land for the Quarantine de Lévis. Presented February 3, 1916.—*Mr. Bourassa*.. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..*Not printed.*

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**72a.** Report of the Royal Commission appointed to inquire into the origin of the fire which destroyed the Central Parliament Building at Ottawa, on Thursday, 3rd February, 1916. Also copy of evidence taken before the Royal Commission appointed to inquire into the origin of the fire which destroyed the Central Parliament Building at Ottawa, on Thursday, 3rd February, 1916. Presented by Hon. Mr. Rogers, May 16, 1915.
*Printed for sessional papers only.*

**73.** Copy of Order in Council, No. P.C. 162, dated 29th January, 1916,—Establishment of the rank of wireless operator in the Royal Naval Canadian Volunteer Reserve and regulations for the proper government thereof. Presented by Hon. Mr. Hazen, February 7, 1916.. . . . . ..*Not printed.*

**74.** Copy of Orders in Council, No. P.C. 183, dated 31st January, 1916,—Regulations governing the payment of allowance to officers of the Royal Canadian Naval Service acting as interpreters. Presented by Hon. Mr. Hazen, February 7, 1916.. . . . . ..*Not printed.*

**74a.** Copy of Order in Council No. P.C. 54/601, dated 16th March, 1916, authorizing payment of messing allowance to Royal Naval Reserve Officers. Presented by Hon. Mr. Hazen, March 29, 1916.. . . . . ..*Not printed.*

**75.** Communication from the Acting High Commissioner for Canada in London, Sir George Perley, enclosing a report on the Canadian Hospital at Dinard by Dr. Rallier du Baty, Chief Surgeon at the said hospital. Presented by Sir Robert Borden, February 7, 1916.
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**76.** A communication from the Right Honourable A. Bonar Law, Colonial Secretary, to His Royal Highness the Governor General, enclosing a copy of the Imperial Parliamentary Debates (House of Commons, 10th January) on a resolution which was adopted by that House, as follows:—"That with a view to increasing the power of the Allies in the prosecution of the war, His Majesty's Government should enter into immediate consultation with the Governments of the Dominions in order with their aid to bring the whole economic strength of the Empire into co-operation with our Allies in a policy directed against the enemy." Presented by Sir Robert Borden, February 7, 1916.
*Printed for distribution and sessional papers.*

**77.** Correspondence between the Canadian Manufacturers' Association and the Prime Minister, 1914-1915. Presented by Sir Robert Borden, February 7, 1916.. . . . . ..*Not printed.*

**78.** Correspondence between the International Nickel Company and the Prime Minister. Presented by Sir Robert Borden, February 7, 1916.. . . . . ..*Not printed.*

**79.** Return to an Order of the House of the 7th February, 1916, for a copy of all correspondence and reports on the claims of Sealers of British Columbia under the last treaty with the American Republic. Presented February 9, 1916.
*Printed for sessional papers only.*

**80.** Certified copy of a report of the Committee of the Privy Council, approved by His Royal Highness the Governor General on the 15th April, 1915, giving authority for the renewal, from the 31st March, 1916, of the agreement between the Dominion Government and the Province of Alberta for the service of the Royal Northwest Mounted Police in that province. Presented by Sir Robert Borden, February 10, 1916.
*Printed for sessional papers only.*

**81.** Certified copy of a report of the Committee of the Privy Council, approved by His Royal Highness the Governor General on the 21st May, 1915, giving authority for the renewal, from the 31st March, 1916, of the agreement between the Dominion Government and the province of Saskatchewan, for the services of the Royal Northwest Mounted Police in that province. Presented by Sir Robert Borden, February 10, 1916.
*Printed for sessional papers only.*

**82.** Return to an Order of the House of the 8th February, 1916, for a copy of all letters, papers, and other documents relating to the application of Wasyl Pinianski for the patent of the southwest quarter section 5, township 25, range 4, west second principal meridian, Office File No. 1752484. Presented February 16, 1916.—*Mr. MacNutt*... ..*Not printed.*

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## CONTENTS OF VOLUME 28—*Continued.*

## CONTENTS OF VOLUME 28—*Continued.*

## CONTENTS OF VOLUME 28—*Continued.*

**117.** Return to an address to His Royal Highness the Governor General of the 7th February, 1916, for a copy of all evidence, reports, memoranda or Orders in Council, relative to the retirement or dismissal from the customs service at the Port of Halifax, of A. J. Crosby, Thomas Lynch and J. B. Naylor. Presented February 25, 1916.—*Mr. Maclean (Halifax)* . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . *Not printed.*

**118.** Return to an Order of the House of the 9th February, 1916, for a copy of all correspondence and reports relating to the closing of the Customs Preventive Station at Vicars, Quebec; the opening of Customs House Office or Preventive Station at Frontier, Quebec, county of Huntingdon, and subsequent protest against the closing of the office at Vicars. Also for a return showing reports since 1912 of inspectors and collector as to the administration and ability of Preventive Officer of Customs John W. Curran, recently dismissed, at Vicars, Quebec. Presented February 25, 1916.—*Mr. Maclean (Halifax).* *Not printed.*

**119.** Return to an Order of the House of the 3rd February, 1916, for a copy of all letters, telegrams and other documents, including tenders, relating to the establishment of a rural mail route between Pictou and West River, in the county of Pictou. Presented February 25, 1916.—*Mr. Macdonald*. . . . . . . . . . . . . . . . . . . . . . . . . *Not printed.*

**120.** Return to an Order of the House of the 14th Ferbuary, 1916, for a return showing the different rural mail routes in the constituency of Qu'Appelle, their location and date of establishment, and all rural mail routes now being established or under consideration at the present time in the same constituency. Presented February 25, 1916.—*Mr. Thomson (Qu'Appelle)* . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . *Not printed.*

**121.** Return to an Order of the House of the 3rd February, 1916, for a copy of all documents, letters, messages, correspondence and reports concerning the contract for carrying the mails between the post office at Saint Jean, P.Q., and the railway stations of the Canadian Pacific Railway Company, the Grand Trunk Railway Company and the Vermont Central Railroad Company since and during the year 1911. Presented February 25, 1916.—*Mr. Demers*. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . *Not printed.*

**122.** Return to an Order of the House of the 3rd February, 1916, for a copy of all letters, telegrams and other documents, including tenders, relating to the establishment of the rural mail route from Eureka to Sunnybrae and return, in the county of Pictou. Presented February 25, 1916.—*Mr. Macdonell*. . . . . . . . . . . . . . . . . . . . . *Not printed.*

**123.** Return to an Order of the House of the 16th February, 1916, for a copy of all telegrams, letters, petitions, and of all documents of all kinds, in any way referring to the awarding of the contract for carrying the mail to Upper Margaree Post Office and Gillies Post Office. Presented February 25, 1916.—*Mr. Chisholm (Inverness)*. . . . . *Not printed.*

**124.** Return to an Order of the House of the 16th February, 1916, for a copy of all telegrams, letters, petitions, and of all documents of all kinds in any way referring to the awarding of the contract for carrying the mail to Margaree Harbour and Cheticamp. Presented February 25, 1916.—*Mr. Chisholm (Inverness)*. . . . . . . . . . . *Not printed.*

**125.** Return to an Order of the House of the 8th March, 1915, for a return showing the amounts of money expended, in construction work or repairs, apart from salaries paid to permanent or yearly officials or employees in the Departments of Public Works, Railways and Canals, Militia and Defence, Marine and Fisheries, and Agriculture, within the county of Cumberland, during the fiscal years 1896 to 1911, both inclusive, together with the particular purpose of each expenditure, and where expended. Presented February 28, 1916.—*Mr. Rhodes*. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . *Not printed.*

**126.** Revenues of Canada for years 1909-10-11, also amounts voted for agriculture in years 1909-10-11.—*(Senate)*. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . *Not printed.*

**127.** Return to an Order of the House of the 3rd February, 1916, for a copy of the investigation held on the loss of a horse belonging to Louis de Gonzague Belzile, of Amqui, county of Matane, during the year 1915. Presented March 1, 1916.—*Mr. Boulay.* *Not printed.*

**128.** Return to an Order of the House of the 3rd February, 1916, for a copy of the report of the investigation held in the case of Messrs. Nazaire Morin and Napoléon Hébert, of Ste. Florence, county of Matane, bearing the number 10083 of the records of Mr. Alward, of Moncton. Presented March 1, 1916.—*Mr. Boulay*. . . . . . . . . . . . . *Not printed.*

**129.** Return to an Order of the House of the 3rd February, 1916, for a copy of the report of the investigation held in connection with the burning of the barn of George Lavoie, a farmer at Bic, on the 23rd May, 1914. Presented March 1, 1916.—*Mr. Boulay.* *Not printed.*

**130.** Return to an Order of the House of the 3rd February, 1916, for a copy of the investigation held from 1911 to 1913 concerning the loss of a horse, at Lac au Saumon on the Intercolonial Railway by J. S. Théberge. Presented March 1, 1916.—*Mr. Boulay.* *Not printed.*

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**131.** Return to an Order of the House of the 7th February, 1916, for a copy of all letters, telegrams, evidence of witnesses at the investigation, and reports thereon, in relation to the claim of Alexandre D. Doucet, of Beresford, N.B., for cattle killed on the Intercolonial Railroad on May 25, 1915. Presented March 1, 1916.—*Mr. Turgeon.* *Not printed.*

**132.** Return to an Order of the House of the 3rd February, 1916, for a copy of all letters, telegrams, correspondence and agreements between the Department of Railways and Canals, and any official thereof, including the officials of the Intercolonial Railway, regarding the installation of the McQueen Siding, so-called, at Shediac, in the province of New Brunswick, and the subsequent removal thereof. Presented March 1, 1916.—*Mr. Carvell*.. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..*Not printed.*

**132*a*.** Supplementary Return to an Order of the House of the 3rd February, 1916, for a copy of all letters, telegrams, correspondence and agreements between the Department of Railways and Canals, and any official thereof, including the officials of the Intercolonial Railway, regarding the installation of the McQueen Siding, so-called, at Shediac, in the province of New Brunswick, and the subsequent removal thereof. Presented March 23, 1916.—*Mr. Carvell*.. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..*Not printed.*

**133.** Return to an Order of the House of the 7th February, 1916, for a return showing:—1. The names, post office addresses, rate of wages and gross amount paid during the year 1915, to all engineers and employees of every description, engaged in connection with the survey of a branch line of the Intercolonial Railway in Guysborough County. 2. The gross expenditure in any way connected with the survey referred to in paragraph one since October, 1911. Presented March 1, 1916.—*Mr. Sinclair*.. .. .. ..*Not printed.*

**134.** Return to an Order of the House of the 3rd February, 1916, for a copy of all documents, letters and petitions in the possession of the Railway Department relating to the dismissal of Wm. P. Mills, Bridge and Building Master of District Number 4, Intercolonial Railway; and also a copy of all letters, telegrams, petitions and documents of all kinds in the possession of the Government either in Ottawa or at Moncton, relating in any way to the application of said Wm. P. Mills for an investigation into the causes which led to his dismissal. Presented March 1, 1916.—*Mr. Chisholm (Inverness).* *Not printed.*

**135.** Return to an Order of the House of the 7th February, 1916, for a return showing the names and salaries of all the officials, assistants and clerks employed in the Intercolonial Railway offices in Moncton, including the assistant superintendent's office, dispatcher's office, station and freight house, the names and salaries of the foremen employed in each of the shops, and also the names of all officials, clerks, engine drivers and conductors who have been retired and placed on the pension list since the first of January, 1915, with the amount of the annual retiring allowance to each. Presented March 1, 1916.—*Mr. Copp*.. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..*Not printed.*

**136.** Return to an Order of the House of the 3rd February, 1916, for a copy of all letters, papers, evidence, reports and all other documents relating to the investigation into certain alleged irregularities in the weighing of freight on the Intercolonial Railway at Stellarton and New Glasgow in 1914 and 1915, and the dismissal of Arthur McLean in connection therewith. Presented March 1, 1916.—*Mr. Macdonald*.. .. .. ..*Not printed.*

**137.** Return to an Order of the House of 3rd February, 1916, for a copy of all telegrams, letters and other documents in connection with repairs to wharf at Shag Harbour, Shelburne County, N.S., during the years 1915 and 1916. Presented March 1, 1916.—*Mr. Law*.. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..*Not printed.*

**138.** Return to an Order of the House of the 7th February, 1916, for a copy of all letters, telegrams and other papers or documents in the possession of the Department of Public Works relating to a request made by the Nova Scotia Historical Society for permission to place a memorial tablet commemorating the late Reverend Dr. James MacGregor, on the post office building, New Glasgow, N.S. Presented March 1, 1916.—*Mr. Sinclair.*

**139.** Return to an Order of the House of the 8th February, 1916, for a return showing:—1. Who had the contract or contracts for supplies, meats and other provisions required for the dredges of the Department of Public Works, working in the East River of Pictou or elsewhere in Pictou County, during the years 1914 and 1915, respectively. 2. Amounts paid respectively to each of said tenderers. Presented March 1, 1916.—*Mr. Macdonald*.. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..*Not printed.*

**140.** Return to an Order of the House of the 7th February, 1916, for a return showing all sums of money expended during the present fiscal year to December 31, 1915, by the Department of Public Works, respectively, for public buildings, harbours and rivers, roads and bridges, telegraph and telephone lines, dredging, and for miscellaneous purposes, chargeable to income, showing said expenditure under the above headings and by provinces. Presented March 1, 1916.—*Mr. Maclean (Halifax)*.. .. ..*Not printed.*

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**154.** Return to an Order of the House of the 1st March, 1915, for a return showing the names and addresses of all persons who received bounty. Raid Bounty was paid in the county of Halifax, N.S., to date. Presented March 3, 1916.—*Mr. Maclean (Halifax).* *Not printed.*

**155.** Return to an Order of the House of the 31st March, 1915, for a copy of all applications received for Fenian Raid Bounty from residents of the county of Hants, N.S.; also the names of persons who have been paid the bounty and those who have been refused it in said county; with the reasons for refusal, and showing the number of applications that have not yet been dealt with. Presented March 3, 1916.—*Mr. Chisholm (Inverness)*. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .*Not printed.*

**156.** Return to an Order of the House of the 22nd March, 1915, for a return showing the names and addresses of all persons who received bounty under the provisions of the Fenian Raid Volunteer Bounty Act, in respect of services rendered in the county of Richmond, Nova Scotia; and the names and addresses of all whose claims for bounty have been rejected, and the reasons for rejecting the same. Presented March 3, 1916.—*Mr. Kyte*. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .*Not printed.*

**157.** Return to an Order of the House of the 23rd February, 1916, for a return showing the names of all shell inspectors employed in and about the Nova Scotia Steel Company, and the other factories producing shells at New Glasgow, in the county of Pictou. Presented March 3, 1916.—*Mr. Macdonald*. . . . . . . . . . . . . . . . . . . . .*Not printed.*

**158.** Return to an Order of the House of the 16th February, 1916, for a list of the permanent and other employees on the Soulanges Canal in 1910, with the salary of each of them; also a list of the employees, permanent or otherwise, in 1915, and the salary of each of them. Presented March 3, 1916.—*Mr. Boyer*. . . . . . . . . . . . . . *Not printed.*

**159.** Unclaimed balances in the banks for patriotic purposes. Correspondence relating to.—*(Senate)*. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .*Not printed.*

**160.** Return to an Order of the House of the 3rd February, 1916, for a copy of all letters, telegrams and other documents in connection with repairs, upkeep and watchman's services on patrol boat A, *Captain Blackford*, while laid up at Shelburne, N.S., during the month of December, 1914, and subsequent months until ready for sea in 1915. Presented March 6, 1916.—*Mr. Law*. . . . . . . . . . . . . . . . . . . . . . . . . .*Not printed.*

**161.** Return to an Order of the House of the 3rd February, 1916, for a copy of all letters, telegrams and other documents in detail, showing expenses, mileage and disbursements of Joseph W. V. Wilson, of Barrington, N.S., as fishery guardian in Shelburne, N.S., during year 1915. Presented March 6, 1916.—*Mr. Law*. . . . . . . . . . . . .*Not printed.*

**162.** Return to an Address to His Royal Highness the Governor General, of the 3rd February, 1916, for a copy of all Orders in Council, letters, telegrams, reports and other documents in connection with the commandeering of wheat about the 27th November, 1915, and in connection with the disposal of such wheat. Presented March 6, 1916.—*Mr. Knowles.* *Not printed.*

**162*a*.** Supplementary Return to an Address to His Royal Higness the Governor General of the 3rd February, 1916, for a copy of all Orders in Council, letters, telegrams, reports and other documents in connection with the commandeering of wheat about the 27th November, 1915, and in connection with the disposal of such wheat. Presented March 10, 1916.—*Mr. Knowles*. . . . . . . . . . . . . . . . . . . . . . . . . . . . . .*Not printed.*

**163.** Return to an Order of the House of the 21st February, 1916, for a return showing the different rural mail routes in the constituency of Regina, their location and date of establishment, and all rural routes under consideration at the present time in said constituency. Presented March 7, 1916.—*Mr. Martin (Regina)*. . . . . . . .*Not printed.*

**164.** Return to an Order of the House of the 7th February, 1916, for a copy of all tenders, offers, letters, telegrams, engineer's reports and other documents relating to the construction of a breakwater or boat harbour at North Lake, Prince Edward Island. Presented March 7, 1916.—*Mr. Hughes, (Kings, P.E.I.)*. . . . . . . . . . . .*Not printed.*

**165.** Return to an Order of the House of the 23rd February, 1916, for a return showing the names of all persons who worked at the repairing of the wharf at Rivière Ouelle during the summer of 1915 with a statement of their occupations and the amounts paid to them, respectively. Presented March 7, 1916.—*Mr. Lapointe (Kamouraska)*. . . .*Not printed*

**166.** Return to an Order of the House of the 3rd February, 1916, for a copy of all letters, telegrams and other documents relative to repairs on the *Hanover* at Cape Negro, Shelburne County, N.S., in 1915. Presented March 7, 1916.—*Mr. Law*. . . . .*Not printed*

**167.** Return to an Order of the House of the 3rd February, 1916, for a copy of all letters, papers, pay-rolls, telegrams and correspondence in connection with the expenditure of, and receipts and vouchers for moneys paid for, the building of a wharf or blocking at the head of Belleville, Yarmouth County, N.S. Presented March 7, 1916.—*Mr. Law.* *Not printed.*

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## CONTENTS OF VOLUME 28—*Continued.*

## CONTENTS OF VOLUME 28—*Continued.*

## CONTENTS OF VOLUME 28—*Continued.*

**222.** Return to an Order of the House of the 3rd February, 1916, for a copy of all petitions, letters, papers, telegrams, tenders and other documents relating to the establishment of rural mail route from Scotsburn to North Scotsburn, Rogers Hill and Hardwood Hill, and as to the closing of any post offices on said route. Presented March 31, 1916.—*Mr. Macdonald*.. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..*Not printed.*

**223.** Return to an Order of the House of the 9th February, 1916, for a copy of all documents, letters, messages, correspondence, reports, etc., regarding the cancellation of the subsidy contract to the Compagnie de Navigation Trans-St. Laurent, and the granting of a like contract to another company, for service between Rivière du Loup, Tadoussac and other ports on the north shore, including all correspondence exchanged between the Department of Trade and Commerce, the Post Office Department, or the ministers of such departments and the two above-named companies. Presented April 3, 1916.—*Mr. Gauvreau*.. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..*Not printed.*

**224.** Return to an Order of the House of the 7th February, 1916, for a return showing the amounts expended by the Post Office Department for that part of the present fiscal year ending 31st December, 1915, under the following subheads: Conveyance of mails by land; conveyance of mails by railways; conveyance of mails by steamboats; making and repairing mail bags, locks, etc.; rural mail boxes, salaries, travelling expenses, manufacturing postage stamps and postage notes, tradesmen's bills, stationery, printing and advertising, miscellaneous disbursements, and maintenance of the service in the Yukon. Also showing the revenue for the same period under the various sub-heads of revenue mentioned in Appendix "A" of the report of the Postmaster General for the year ending March 31, 1915. Presented April 3, 1916.—*Mr. Maclean (Halifax). Not printed.*

**225.** Return to an Order of the House of the 21st February, 1916, for a copy of a petition from the citizens of Louisville, requesting that L. F. Sanfaçon be not dismissed from his position of postmaster of that town; also of all letters sent by A. Bellemare, M.P., in connection with the dismissal of said L. F. Sanfaçon and asking for such dismissal; and of all letters from the same A. Bellemare, M.P., recommending Chas Ed. Lasage as postmaster in the place of the said L. F. Sanfaçon. Presented April 3, 1916.—*Mr. Gauvreau*.. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..*Not printed.*

**226.** Return to an Order of the House of the 23rd February, 1916, for a copy of all documents, reports, correspondence, etc., relating to the changing of St. Eleuthère Station on the National Transcontinental Railway. Presented April 3, 1916.—*Mr. Lapointe (Kamouraska)*.. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..*Not printed.*

**227.** Return to an Order of the House of the 13th March, 1916, for a copy of all instructions, letters, telegrams, and of other documents relating to any action taken, or to be taken, against the firm of Jas. W. Cumming, by the Department of Railways on account of the disclosures made in regard to irregularities in the weighing of freight, as appears in Return No. 25, dated February 29, 1916. Presented April 3, 1916.—*Mr. Macdonald. Not printed.*

**228.** Certified copy of a Report of the Committee of the Privy Council, approved by His Royal Highness the Governor General on the 3rd April, 1916, respecting the appointment of a Royal Commission to inquire into certain contracts made by a committee (known as the Shell Committee) of which General Sir Alexander Bertram was chairman. Presented by Sir Robert Borden, April 3, 1916.. .. .. .. .. .. .. .. .. .. .. ..*Not printed.*

**228*a*.** Certified copy of a Report of the Committee of the Privy Council, approved by His Royal Highness the Governor General on the 15th April, 1916, concerning the transmission of the Hansard report containing the debate on the motion of Sir Wilfrid Laurier re expenditure made by the Shell Committee (so-called), to the Right Honourable the Secretary of State for the Colonies, together with a copy of the Order in Council approved on the 3rd instant authorizing the issue of a Royal Commission to inquire into certain contracts made by the said Shell Committee (so-called). Presented by Sir Robert Borden, April 17, 1916... .. .. .. .. .. .. .. .. .. .. .. ..*Not printed.*

**229.** Return to an Order of the House of the 20th March, 1916, for a copy of all letters, recommendations, telegrams, reports of officials and other documents relating to the appointment of A. Kastella as Mechanical Superintendent of Dredges, and as to his resignation from said office, and also as to causes and reasons of his resignation or removal. Presented April 4, 1916.—*Mr. Macdonald*.. .. .. .. .. .. .. ..*Not printed.*

**230.** Return to an Address to His Royal Highness the Governor General, of the 21st February, 1916, for a copy of all letters, telegrams, memos, Orders in Council, reports, and of all and every document concerning the construction of the dam at Grand Mère, county of Champlain, province of Quebec, by the Laurentide Co., Limited. Presented April 4, 1916—*Mr. Lemieux*.. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. *Not printed.*

**231.** Memorandum No. 2, respecting work of the Department of Militia and Defence—European War 1914-15, from 1st February, 1915 to 31st January, 1916. Presented by Hon. Mr. Kemp, April 5, 1916... .. .. .. .. .. .. .. .. .. .. ..*Printed for sessional papers only.*

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**243.** Return to an Order of the House of the 3rd February, 1916, for a copy of all letters, telegrams, or other communications sent to the Government or any member or department thereof before 15th August, 1914, pointing out the necessity of granting relief to the settlers in the drouth-stricken area of Alberta. Presented April 10, 1916.—*Mr. Buchanan*.......... *Not printed.*

**244.** Return to an Address to His Royal Highness the Governor General, for a copy of all correspondence with the Imperial authorities respecting legislation by the Parliament of the United Kingdom, in answer to the petition of the Canadian Parliament asking for amendment of the *British North America Act* with reference to the Senate. Presented April 10, 1916.—*Sir Wilfrid Laurier*.......... *Printed for sessional papers only.*

**245.** Return to an Address to His Royal Highness the Governor General of the 7th February, 1916, for a copy of all letters, correspondence, memoranda, Orders in Council, etc., relative to the Transatlantic Mail Service for the winter season 1915-16, and passing between the contractor company and any Department of Government or Minister of the Crown. Presented April 10, 1916.—*Mr. Maclean (Halifax)*.......... *Not printed.*

**246.** Return to an Order of the House of the 21st February, 1916, for a return showing the amounts of money paid by all Departments of the Government to the Regina "Province" and "Standard," the Moosejaw "News," and the 'Saskatchewan Star," respectively, in each of the years 1914 and 1915. Presented April 10, 1916.—*Mr. Martin (Regina)*.......... *Not printed.*

**247.** Return to an Order of the House of the 5th April, 1916, for a copy of all questions asked of candidates for examination in the Inside Civil Service since the 1st May, 1912. Presented April 10, 1916.—*Mr. Boulay*.......... *Not printed.*

**248.** Return to an Order of the House of the 3rd February, 1916, for a return showing:—1. Who recruiting officers were for the counties of Lunenburg, Queens, Shelburne and Yarmouth, Nova Scotia, during the months of July, August, September, October, November and December, 1915. 2. What remuneration each received during each month, for salary, disbursements and expenses. 3. If they are still employed as recruiting officers. 4. If so, what salary is being paid each recruiting officer per day or per month. Presented March 10, 1916.—*Mr. Kyte*.......... *Not printed.*

**249.** Return to an Order of the House of the 16th February, 1916, for a return showing:—1. Whether the Government, or the Department of Militia and Defence has employed any parties other than the officers of the permanent force to obtain recruits for the overseas forces. 2. If so, the number of persons so employed in each province. Presented April 11, 1916.—*Mr. Hughes (P.E.I.)*.......... *Not printed.*

**250.** Return to an Order of the House of the 3rd February, 1916, for a return showing the names and addresses of members of the House of Commons and of the various Provincial Legislatures in Canada who are in the service of the Department of Militia and Defence, either in Canada or overseas; the official rank and rate of pay of each; the names of those who are now in Canada; the names of those who are in England; and the names of those who are or have been in active service at any of the battle fronts. Presented April 11, 1916.—*Mr. Kyte*.......... *Not printed.*

**251.** Return to an Order of the House of the 16th February, 1916, for a return showing:—1. The amounts expended in railway subsidies in Canada during the years 1912, 1913, 1914 and 1915. 2. The amounts by provinces, and the names of the lines to which granted. 3. Amounts expended on the construction of Government-owned railways in Canada during the above years. 4. The amount expended in each province, and the name of the line of railway on which such expenditure was made. 5. Amounts expended on harbour and river improvements in Canada during the above years. 6. The amounts by provinces and the particular places where expended. 7. Amounts expended on the building of public wharves, public breakwaters, and public dredging in North Cape Breton and Victoria during the years 1905 to 1911, inclusive, including the expenditure on Government railways. 8. Amounts expended for like purposes in the said county, during the years 1912, 1913, 1914 and 1915. Presented April 11, 1916.—*Mr. McKenzie.*
*Not printed.*

**252.** Return to an Order of the House of the 29th March, 1916, for a copy of all letters, telegrams, etc., exchanged between the Department of Public Works and the Department of Justice and the Council of the Town of Rigaud, Archibald Macdonald, Elzear Montpetit, and the Rigaud Granite Company, Limited, in connection with the military building. Presented April 11, 1916.—*Mr. Boyer*.......... *Not printed*

**253.** Return to an Order of the House of the 3rd April, 1916, for a copy of all letters, telegrams and correspondence of all kinds in any way referring to a subsidy granted to the ss. *Amethist*, plying between Montreal and Newfoundland ports during the years 1910-11 and 1911-12. Presented April 11, 1916.—*Mr. Maclean (Halifax)*.. *Not printed.*

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**265.** Return to an Order of the House of the 12th April, 1916, for a return showing:—1. How many clerks there are in the Finance Department who belong to and are paid from the outside service vote and who work in the inside service. 2. The names of said clerks. 3. Salary paid to each. 4. How long each has been in the service of the Department. 5. If all or any of these clerks have passed any examination. If so, what examination and on what date or dates. Presented April 26, 1916.—*Mr. Turriff*.. .. ..*Not printed*

**266.** Return to an Order of the House of the 23rd February, 1916, for a return showing:—1. The number of permanent employees in the Department of Inland Revenue in 1915-16 2. How many there will be in 1916-17. 3. How much money was paid in salaries for temporary employees in each of the following years: 1912-13, 1913-14, 1914-15 and 1915-16. 4. The names of the temporary employees and the dates of their appointment, respectively. Presented April 26, 1916.—*Mr. Lanctot*.. .. .. .. .. .. .. ..*Not printed.*

**267.** Return to an Order of the Senate dated the 14th instant, showing the number of men recruited up to the first day of April, 1916.—(*Senate*).. .. .. .. .. .. ..*Not printed*

**268.** Return to an Order of the Senate, dated the 23rd day of March, 1916, of all papers and documents dealing with the escapes and the liberation of alien enemy prisoners from the detention camp situated at Banff, in the province of Alberta. Ordered, That the same do lie on the table.—(*Senate*).. .. .. .. .. .. .. .. .. .. .. .. ..*Not printed.*

**269.** Return to an Order of the House of the 19th April, 1916, for a return showing:—1 Whether there is a Director of Recruiting and Organizations in England for the Canadian Service. 2. If so, his name and duties. 3. The number employed upon his staff. 4. The total expenses of his staff. Presented April 28, 1916... .. .. .. ..*Not printed.*

**270.** Return to an Order of the Senate, dated 11th instant:—For a copy of an application made by Rev. Isaac Hunter Macdonald, of Kintore, Ontario, to the Militia Department for a position of chaplain or major; also, of all copies of letters, papers or telegrams either recommending or opposing said application.—(*Senate*).. .. .. .. ..*Not printed.*

**271.** Return to an Address to His Royal Highness the Governor General of the 29th March, 1916, for a copy of all petitions received by the Governor General in Council requesting the disavowal of the Act of the Legislature of the Province of Ontario, Chapter 45, 5 George V, 1915, concerning the School Commission of the Roman Catholic Schools of the City of Ottawa, and of all documents, memoranda, reports, letters and correspondence concerning the said petitions for disavowal, or concerning the said Act of the Legislature of the Province of Ontario, 5 George V, Chapter 45. Presented May 1, 1916.—*Mr. Lapointe (Kamouraska)*.. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..*Not printed.*

**271*a*.** Order in Council and Report of Minister of Justice transmitting to Lieutenant Governor of Ontario copy of petition from Samuel Genest and others, praying for the disallowance of an Act of the Legislature of Ontario, Chapter 45 of 5 George V (1915). Order in Council and Report of Minister of Justice on the Statutes of the Legislature of Ontario, passed in the 5th year of His Majesty's reign (1915). Report of Prime Minister of Ontario on petition relating to the disallowance of an Act of the Legislature of Ontario, Chapter 45 of 5 George V (1915). Presented May 3, 1916.—*Mr. Lapointe (Kamouraska)*.. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..*Printed for sessional papers only.*

**272.** Return to an Order of the House of the 20th March, 1916, for a copy of all telegrams, letters, correspondence and contracts between the Quebec Harbour Commission and Benjamin Demers, of the parish of St. Nicolas, county of Lévis, concerning the purchase of the St. Nicolas quarry. Presented May 1, 1916.—*Mr. Bourassa*.. .. .. .. ..*Not printed*

**273.** Return to an Order of the House of the 13th March, 1916, for a return showing a list of vessels belonging to the Canadian Government which are on service under the provision of the Canadian Naval Act, and of all vessels not now in service and their present condition and suitability for service, and also for a copy of all letters, petitions or communications had by or with the Government in regard to the establishment of a Canadian Naval Brigade. Presented May 1, 1916.—*Mr. Macdonald*.. .. ..*Not printed.*

**274.** Return to an Order of the House of the 29th March, 1916, for a copy of all correspondence, petitions and papers, including the report of Charles Bruce, engineer, in the possession of the Department of Marine and Fisheries relating to the construction of a bait freezer at White Head, Nova Scotia. Presented May 1, 1916.—*Mr. Sinclair*
*Not printed*

**275.** Duplicate Return to an Order of the House of the 17th March, 1915, for a copy of all correspondence and reports relating to the purchase of 25,000 shovels of special pattern, mentioned in Order in Council P.C. 2302, dated 4th September, 1914, on page 38 of memoranda respecting work of the Department of Militia and Defence, and also relating to any further purchases of such shovels. Presented May 1, 1916.—*Mr. Hughes (P.E.I.)*.. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..*Not printed*

## CONTENTS OF VOLUME 28—*Continued.*

**276.** Return to an Order of the House of the 5th April, 1916, for a copy of all letters, telegrams, offers, tenders, reports, contracts and documents relating to the sale or other disposal of small arms ammunition since 4th August, 1914. Presented May 1, 1916.—*Mr. Macdonald*.......... *Not printed.*

**276a.** Supplementary Return to an Order of the House of the 5th April, 1916, for a copy of all letters, telegrams, offers, tenders, reports, contracts and documents relating to the sale or other disposal of small arms ammunition since 4th August, 1914. Presented May 2, 1916.—*Mr. Macdonald*.......... *Not printed.*

**277.** Return to an Order of the House of the 23rd February, 1916, for a copy of all documents, correspondence, reports, etc., concerning the dismissal of J. B. Levesque, of Rivière Ouelle, as steward on the steamer *Champlain*. Presented May 2, 1916.—*Mr. Lapointe (Kamouraska)*.......... *Not printed.*

**278.** Return to an Order of the House of the 13th March, 1916, for a copy of all correspondence, memoranda, reports, telegrams, recommendations, orders, etc., between the Department of Railways and Canals and the officers of the St. Maurice Fire Protective Association with reference to fire protection on the Transcontinental Railway line between Hervey Junction and the western boundary of the Province of Quebec. Presented May 2, 1916.—*Mr. Bureau*.......... *Not printed.*

**279.** Return to an Order of the House of the 20th March, 1916, for a copy of all letters, telegrams, correspondence and contracts between the Department of Railways and Canals or any official thereof, including the officials of the Intercolonial Railway, and any member of the Government of New Brunswick, the St. John and Quebec Railway Company or any official thereof, regarding the operation of the Valley Railway, so-called, in the Province of New Brunswick, from the first day of October, 1914, down to the present date. Presented May 2, 1916.—*Mr. Carvell*.......... *Not printed.*

**280.** Return to an Order of the House of the 10th April, 1916, for a copy of a certain lease made by the Government of Canada to one J. A. Culverwell, of a certain water-power on the Trent waterway, known as the Burleigh Falls power; and of all assignments of said lease and of the consents of the Government of Canada thereto; and also a copy of all correspondence, telegrams, tenders, reports, contracts and other papers, relating to the said original lease. Presented May 2, 1916.—*Mr. Burnham*.......... *Not printed.*

**281.** Return to an Order of the Senate, dated the 12th April, 1916, showing copies of all petitions, correspondence, etc., relating to the purchase, by the Government, of the Quebec and Saguenay Railway.—*(Senate)*.......... *Not printed.*

**282.** 1. Copy of letter from the Chairman of the Grand Trunk Railway Company of Canada to the Prime Minister *re* proposals made in respect to the Grand Trunk Pacific Railway Company.

2. Schedule of outstanding bonds, debentures, loans and notes, 1st January, 1916, and interest payments of the Grand Trunk Pacific Railway Company and Grand Trunk Pacific Branch Lines Company.

3. Memorandum *re* Grand Trunk Pacific Act, 1914, and proceeds of securities issued thereunder.

4. Statement showing bonds, etc., authorized, issued and outstanding and net proceeds therefrom, also interest payable for the years 1916 and 1917 (as from 29th February, 1916), Grand Trunk Pacific Railway and Grand Trunk Pacific Branch Lines.

5. Advances by Grand Trunk Railway Company at 29th February, 1916.

6. Financial statements of the Canadian Northern Railway System, 15th April, 1916.

7. Memorandum *re* Canadian Northern Railway Company Guarantee Act, 1914, and proceeds of securities issued thereunder.

8. Letter from G. A. Bell, financial comptroller of the Department of Railways and Canals to the Prime Minister, in respect to issue of his certificate for the purpose of releasing the proceeds of the forty-five million dollar, 4 per cent debenture stock, guaranteed by the Dominion Government. Presented by Sir Robert Borden, May 3, 1916. *Printed for distribution and sessional papers.*

**282a.** Copies of mortgage deed of trust securing an issue of $16,000,000 of Grand Trunk Pacific Railway bonds, guaranteed by the Dominion Government. Presented by Sir T. White, May 5, 1916.......... *Printed for distribution and sessional papers.*

**282b.** Copies of mortgage deed of trust securing an issue of $45,000,000 of Canadian Northern Railway securities, guaranteed by the Dominion Government, issued under the legislation of 1914. Presented by Sir Thos. White, May 5, 1916.

**283.** Return to an Order of the House of the 23rd February, 1916, for a return showing:—1. The amount which has been paid out for new buildings and repairs at the Royal Military College and at Fort Henry, in each of the years 1912, 1913, 1914 and 1915. 2. To whom the money was paid, and the amount in each case. 3. What portion of the work was tendered for, and the amount of each tender submitted. Presented May 3, 1916.—*Mr. Edwards*.......... *Not printed.*

## CONTENTS OF VOLUME 28—*Continued.*

## CONTENTS OF VOLUME 28—*Concluded.*

DEPARTMENT OF THE INTERIOR, CANADA
IRRIGATION BRANCH

# ROLL OF HONOUR

Employees Enlisted for Active Service

| | | | |
|---|---|---|---|
| J. W. H. Wilkes | Leveller | Aug. 16, 1914 | Pte. Royal Dragoons |
| E. S. McMillan | Draughtsman | Aug. 21, 1914 | Spr. Div'l Engineers |
| W. E. Dow | Draughtsman | Aug. 22, 1914 | Q.M.S. Div'l Cyclists |
| C. V. Craik | Asst. Engineer | Aug. 22, 1914 | Corp. Div'l Engineers |
| E. S. Clifford | Hydro. Asst. | Aug. 24, 1914 | Maj., Asst. Provost Marshal |
| R. V. Muller | Leveller | Aug. 26, 1914 | Pte. Royal Dragoons |
| C. E. Vrooman | Leveller | Sept. 26, 1914 | Spr. Div'l Engineers |
| C. P. Maxted | Rodman | Sept. 26, 1914 | Spr. Div'l Engineers |
| H. E. Bowden | Teamster | Sept. 26, 1914 | Spr. Div'l Engineers |
| J. S. Ferrier | Draughtsman | Nov. 6, 1914 | Lieut. Northumberland Fus. |
| H. D. St. A. Smith | Asst. Engineer | Nov. 9, 1914 | Lieut. Div'l Engineers |
| C. B. Hornby | Accountant | Nov. 16, 1914 | Lieut. 31st Battalion |
| G. N. Page | Leveller | Nov. 16, 1914 | Pte. Army Service Corps |
| D. C. McDougall | Accountant | Nov. 19, 1914 | Q.M.S. Div'l Engineers |
| G. H. Nettleton | Hydro. Asst. | Jan. 4, 1915 | Sergt. 12th Mounted Rifles |
| H. S. Kerby | Engineer | Feb. 11, 1915 | Lieut. Royal Aviation Corps |
| J. H. Jones | Asst. Engineer | April 26, 1915 | Capt. 56th Battalion |
| E. W. W. Hughes | Engineer | May 8, 1915 | Pte. 53rd Battalion |
| G. R. Elliott | Engineer | Aug. 16, 1915 | Lieut. Div'l Cyclists |
| W. T. White | Asst. Engineer | Aug. 16, 1915 | Lieut. 1st Pioneer Battalion |
| H. W. Cheney | Asst. Engineer | Sept. 29, 1915 | Lieut. 4th University Co. |
| W. E. Hunter | Accountant | Oct. 2, 1915 | Sergt.-Maj. 77th Battalion |
| E. L. Hornby | Draughtsman | Oct. 12, 1915 | Pte. 1st Pioneer Battalion |
| J. Cawthorn | Clerk | Oct. 14, 1915 | Pte. 1st Pioneer Battalion |
| H. B. R. Thompson | Engineer | Nov. 8, 1915 | Pte. 1st Pioneer Battalion |
| F. R. Burfield | Engineer | Dec. 31, 1915 | Corp. 2nd Tunnelling Co. |
| W. G. Guthrie | Draughtsman | Feb. 20, 1916 | Pte. Army Medical Corps |
| L. E. M. Shenton | Draughtsman | Feb. 24, 1916 | Spr. Australian Imp. Forces |
| W. B. Hutcheson | Asst. Engineer | Mar. 13, 1916 | Lieut. Div'l Engineers |
| H. R. Carscallen | Engineer | Mar. 31, 1916 | Lieut. Div'l Engineers |
| W. R. McCaffrey | Engineer | Mar. 31, 1916 | Sergt. 4th Div'l Cyclists |
| R. E. Matheson | Hydro. Asst. | Mar. 31, 1916 | Spr. Div'l Engineers |
| P. J. Jennings | Engineer | April 1, 1916 | Capt. & Adj. 4th Pioneer Batt. |
| G. H. Whyte | Engineer | April 4, 1916 | Lieut. Div'l Engineers |
| T. H. Burt | Hydro. Asst. | April 4, 1916 | Pte. Army Medical Corps |
| R. H. Goodchild | Engineer | April 22, 1916 | Lieut. 4th Pioneer Battalion |
| L. J. Gleeson | Asst. Engineer | May 9, 1916 | Gunr. 50th Queen's Battery |
| F. K. Beach | Engineer | May 21, 1916 | Lieut. 211th Battalion |
| J. M. Paul | Engineer | May 22, 1916 | Gunr. 50th Queen's Battery |
| O. H. Hoover | Engineer | June 15, 1916 | Pte. Tor. Univ. Battalion |
| I. R. Strome | Engineer | June 20, 1916 | Lieut. 192nd Battalion |
| J. A. Currie | Draughtsman | Aug. 1, 1916 | Gunr. 73rd Field Battery |

# REPORT

OF

# HYDROMETRIC SURVEYS

(STREAM MEASUREMENTS)

FOR

## THE CALENDAR YEAR 1915

PREPARED UNDER THE DIRECTION OF

F. H. PETERS, C.E., COMMISSIONER OF IRRIGATION

BY

P. M. SAUDER, C.E., CHIEF HYDROMETRIC ENGINEER

ASSISTED BY

G. H. WHYTE AND N. M. SUTHERLAND

DIVISIONAL HYDROMETRIC ENGINEERS

*PRINTED BY ORDER OF PARLIAMENT*

OTTAWA

PRINTED BY J. de L. TACHÉ,

PRINTER TO THE KING'S MOST EXCELLENT MAJESTY.

1917.

[No. 25c—1916—1½]

# CONTENTS

# ILLUSTRATIONS



# APPENDIX ILLUSTRATIONS

*To Field Marshal, His Royal Highness Prince Arthur William Patrick Albert, Duke of Connaught and of Strathearn, K.G., K.T., K.P., etc., etc., etc., Governor-General and Commander-in-Chief of the Dominion of Canada.*

MAY IT PLEASE YOUR ROYAL HIGHNESS:

The undersigned has the honour to lay before Your Royal Highness the report of the Progress of Stream Measurements for the year 1915.

Respectfully submitted,

W. J. ROCHE,
*Minister of the Interior.*

OTTAWA, June 12, 1916.

DEPARTMENT OF THE INTERIOR,

OTTAWA, June 12, 1916.

THE HONOURABLE W. J. ROCHE, M.D.,
*Minister of the Interior.*

SIR:—

I have the honour to submit the report of Stream Measurements for the year 1915, and to recommend that it be published as the seventh of a series of progress reports.

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

W. W. CORY,
*Deputy Minister of the Interior.*

DEPARTMENT OF THE INTERIOR,
IRRIGATION BRANCH,
OTTAWA, June 7, 1916.

W. W. CORY, Esq., C.M.G.,
*Deputy Minister of the Interior.*

SIR:—

I submit herewith the report of Stream Measurements for the year 1915, submitted by F. H. Peters, C.E., Commissioner of Irrigation, and would recommend that it be published.

Respectfully submitted,
E. F. DRAKE,
*Superintendent of Irrigation.*

DEPARTMENT OF THE INTERIOR,
IRRIGATION OFFICE,
CALGARY, ALBERTA, May 15, 1916.

E. F. DRAKE, Esq.,
*Superintendent of Irrigation,*
Department of the Interior,
Ottawa, Canada.

SIR:—

I have the honour to transmit herewith the manuscript of the Report of the Progress of Stream Measurements for the calendar year 1915. This report has been prepared, under my direction, by P. M. Sauder, M. Can. Soc. C.E., Chief Hydrometric Engineer, G. H. Whyte, and N. M. Sutherland.

I beg to recommend that it be published as the seventh of the series of Reports of Progress of Stream Measurements.

I have the honour to be, Sir,
Your obedient servant,
F. H. PETERS,
*Commissioner of Irrigation.*

DEPARTMENT OF THE INTERIOR,
IRRIGATION OFFICE,
CALGARY, ALBERTA, May 13th, 1916.

F. H. PETERS, Esq., D.L.S., M. Can. Soc. C.E.,
*Commissioner of Irrigation,*
Department of the Interior,
Calgary, Alta.

SIR:—

I beg to submit herewith the manuscript of the Report of Progress of Stream Measurements for the calendar year 1915.

The introduction gives a brief outline of the methods of obtaining and compiling the data, but owing to the want of space and time, many of the details had to be omitted.

I beg to recommend that this report be published as the seventh of the series of Reports of Progress of Stream Measurements.

As Mr. Elliott went on Active Service in August last, and Mr. Sutherland only remained with us for a short period, most of the records were compiled under the supervision of Mr. G. H. Whyte. I beg therefore to bring to your attention the amount of work that devolved upon Mr. Whyte during the past year.

While our work has been kept going in spite of the war, there has been a very hearty response from the members of the staff to the call to arms, and over fifty per cent. of the original staff employed on the hydrometric survey has already gone on Active Service. I have no doubt that every one of them will be a credit to himself and country, and beg therefore to recommend that the "Honour Roll" of the Irrigation Branch be published as a frontispiece in this report instead of the usual photograph.

I have the honour to be, Sir,
Your obedient servant,
P. M. SAUDER,
*Chief Hydrometric Engineer.*

# REPORT

OF

# PROGRESS OF STREAM MEASUREMENTS FOR THE CALENDAR YEAR 1915.

By P. M. SAUDER, G. H. WHYTE and N. M. SUTHERLAND.

## INTRODUCTION.

### SCOPE OF WORK.

The chief features of the stream measurement work are the collection of data relating to the flow of surface waters and a study of the conditions affecting this flow. Information is also collected concerning river profiles, the duration and magnitude of floods, irrigation and water-power development, storage, seepage, etc., which may be of use in hydrometric studies.

This information is obtained by a series of observations at regular gauging stations which are established at suitable points. The selection of sites for these gauging stations and their maintenance depend largely upon the physical features and needs of the locality. If water is to be used for irrigation purposes the summer flow receives special attention; where it is required for power purposes, it becomes necessary to determine the minimum flow; if water is to be stored, information is obtained regarding the maximum flow. In all cases the duration of the different stages of the streams is recorded. Throughout the country gauging stations are maintained for general statistical purposes, to show the conditions existing through long periods. They are also used as primary stations, and their records in connection with short series of measurements will serve as bases for estimating the flow at other points in the drainage basin.

During the open water season of 1915, records were taken at one hundred and eighty-four (184) regular gauging stations on various streams in Alberta and Saskatchewan and at one hundred and fifteen (115) regular gauging stations on irrigation ditches and canals. Winter records, which are so valuable for power investigations and municipal water supplies, received special attention, and records were secured on almost all the important streams in the two provinces throughout the year.

### ORGANIZATION.

The methods of carrying on the investigations were similar to those of previous years. Local residents were engaged to observe the gauge heights at regular stations. These observations were recorded in a book supplied by the department, and at the end of each week the observer copied the week's records on a postal card which he forwarded to the Calgary office by the first convenient mail.

District hydrometric engineers made regular visits to the gauging stations, usually once in every three weeks. On these visits they examined the observer's records, made discharge measurements and collected such information and data as would be of use in making estimates of the daily flow at the station. The results of the discharge measurements and all data collected were forwarded as soon as possible after being completed to the Calgary office, where all reports are copied on regular forms and filed.

During the winter no records were taken at a number of the gauging stations, which made it possible to reduce the field staff and have each engineer spend some time in the office and assist in the final computations and estimates of run-off. As far as possible the same engineer who did the field work made or checked the office computations, so as to eliminate any chance of error through lack of knowledge of the conditions at the gauging station.

Gauge height-area, gauge height-mean velocity, and gauge height-discharge curves were plotted and rating tables constructed. Tables of discharge measurements, daily gauge

height and discharge, and monthly discharge were also compiled. These records have been collected and are embodied in this, the Seventh Annual Report of Progress of Stream Measurements.

The organization during 1915 was also similar to the previous year, and the staff consisted of the chief hydrometric engineer, two assistant engineers, one recorder, one computer, and one clerk in the office, and fifteen assistant engineers in the field.

During 1915, the territory was divided for administrative purposes into thirteen districts, viz., Banff, Calgary, Macleod, Cardston, Milk River, Western Cypress Hills, Eastern Cypress Hills, Wood Mountain, Saskatoon, Edmonton, Nordegg, Jasper and Peace River. In each district there was one engineer, who while in the field employed temporary assistance and was equipped with the necessary gauging and surveying instruments. In Banff, Calgary, Macleod, Saskatoon, Edmonton and Jasper districts, the engineers travelled by train and hired livery, and stopped at hotels and stopping houses; while in the Cardston, Milk River, Western Cypress Hills, Eastern Cypress Hills and Wood Mountain districts they were supplied with a team, democrat and camping outfit. The engineer in the Nordegg district was supplied with a pack train, while the engineer in the Peace River district travelled largely by boat. One engineer was employed in an investigation of absorption losses in irrigation canals, and other experimental work. The thirteenth engineer was employed at rating current-meters, gauging the streams at Calgary and other local work. During the early spring, three of the irrigation inspecting engineers assisted in collecting records of the early spring run-off in the Cypress hills.

At the beginning of 1916, the organization of the staff under the Chief Hydrometric Engineer was changed, and the whole territory and work was divided into two divisions, namely, Northern and Southern. An engineer, designated the Divisional Hydrometric Engineer, was placed in charge of each division, and was given a staff consisting of one field engineer for each district in his division, an office engineer, and a recorder. This increases the office staff, and it is planned that the divisional engineers shall spend considerable time in field supervision.

## BANFF DISTRICT.

This district included the following regular gauging stations.

| Stream | Location | Date Established |
|---|---|---|
| Bath Creek | NE. 32-28-16-5 | April 9, 1913 |
| Bow River | SE. 28-28-16-5*a* | July 18, 1910 |
| Bow River | SE. 35-25-12-5 | May 25, 1909 |
| Bow River | NW. 32-24-8-5 | March 10, 1912 |
| Cascade River | SE. 19-26-11-5 | August 16, 1911 |
| Fortymile Creek | SW. 2-26-12-5 | July 31, 1912 |
| Ghost River | NE. 23-26-6-5 | August 17, 1911 |
| Jumpingpound Creek | SE. 30-24-4-5 | May 7, 1908 |
| Kananaskis River | SW. 34-24-8-5*b* | August 31, 1911 |
| Louise Creek | NE. 20-28-16-5 | July 5, 1913 |
| Pipestone River | SW. 27-28-16-5 | August 31, 1911 |
| Spray River | SE. 31-22-10-5 | July 23, 1914 |
| Spray Creek | SW. 32-22-10-5 | July 24, 1914 |
| Spray River | SW. 25-25-12-5 | July 15, 1910 |

Records have been obtained throughout the year on all the above stations excepting those on Bath Creek, Spray River (SE. 32-22-10-5), and Spray Creek, where observers were not available during the winter months, and on Jumpingpound Creek, where only open water records were desired.

Miscellaneous gaugings were made of Beaupré Creek (NE. 15-26-5-5), Big Hill Creek (SW. 10-26-4-5), Chiniki Creek (near Morley), Grand Valley Creek (SW. 24-26-5-5), Horse Creek (NE. 8-26-4-5), Spencer Creek (SE. 18-26-5-5), Whiteman Creek, (NW. 24-24-11-5), and the tailrace of Lake Louise power house.

Floods of unusual size occurred on all streams in this district during June, causing considerable damage to property along their banks and adding much to the field and office work.

An automatic gauge was installed on Ghost River during the fall, but was not operated. It is expected that this gauge will give more accurate and continuous records on this important stream.

During the summer a cable station was erected on Spray River (SE. 31-22-10-5), which will enable us to obtain records during high water at this point.

The field work in this district was under the charge of H. C. Ritchie, A.M. Can. Soc. C.E., O. H. Hoover, B.A.Sc., and J. E. Caughey, B.Sc. The final computations for this report were made by H. C. Ritchie and A. B. Cook.

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*a* This station was originally located on NE. 28-28-16-5, but was moved to its present position on August 31, 1911.
*b* This station was originally located on NW. 32-24-8-5, but was moved to its present position on May 13, 1913.

CALGARY DISTRICT.

This district included the following regular gauging stations:

| Stream | Location | Date Established |
|---|---|---|
| Bow River | NE. 32-21-25-4*a* | Sept. 1909 |
| Bow River | SE. 2-21-19-4*b* | August 20, 1909 |
| Bullshead Creek | SE. 16-12-5-4 | July 26, 1909 |
| E. B. Canadian Pacific Railway Company Canal | SE. 3-21-18-4 | June 6, 1914 |
| N. B. Canadian Pacific Railway Company Canal | NW. 3-21-18-4 | June 6, 1914 |
| Elbow River | NW. 12-23-5-5 | Sept. 29, 1914 |
| Fish Creek | SW. 26-22-3-5 | May 13, 1907 |
| Findlay and McDougal Ditch | SW. 31-18-29-4 | June 17, 1911 |
| Highwood River | SE. 20-18-2-5 | July 27, 1912 |
| Highwood River | NW. 6-19-28-4 | May 28, 1908 |
| Highwood River | NW. 17-20-28-4 | October 3, 1911 |
| Little Bow Ditch | SW. 6-19-28-4 | August 1, 1910 |
| Pekisko Creek | NW. 8-17-2-5 | October 6, 1911 |
| Red Deer River | NW. 11-29-20-4 | Oct. 25, 1915 |
| Ross Creek | NW. 31-11-2-4 | July 28, 1909 |
| South Saskatchewan River | NW. 31-12-5-4 | May 31, 1911 |
| Sevenpersons River | NE. 30-12-5-4 | April 27, 1910 |
| Sheep River | NW. 22-20-29-4 | May 25, 1908 |
| N. Br. Sheep River | SW. 12-21-3-5 | May 22, 1908 |
| S. Br. Sheep River | SW. 17-20-2-5 | May 23, 1908 |
| Stimson Creek | NW. 2-17-2-5*c* | Oct. 6, 1911 |

Miscellaneous gaugings were made of a number of branch canals of the Canadian Pacific Railway Company's Irrigation systems, South Branch of Fish Creek (SE. 22-22-3-5), Lineham Spillway at High River, and several springs.

The stations in the immediate vicinity of Calgary were in charge of the rating station engineer.

Most of the streams in this district were subject to floods during the year. These floods changed the discharge curves and also caused some damage to station equipments and considerable damage to property along their banks.

The first suspension bridge erected by this survey was constructed on Fish Creek during November, to enable satisfactory measurements being made during high stages.

The Calgary winter district included only Bow River (SE. 2-21-19-4), E. B. Canadian Pacific Railway Company Canal, Elbow River, Highwood River (NW. 6-19-28-4), Little Bow Ditch and Red Deer River on the above list. The South Saskatchewan River was included in the Macleod district during the winter months.

H. S. Kerby, B.A.Sc., H. W. Rowley, B.Sc., R. J. McGuinness, H. B. R. Thompson and F. K. Beach, A. M. Can. Soc. C.E., had charge of this district for various periods, and R. J. McGuinness, W. H. Storey and G. H. Whyte made the final computations for this report.

MACLEOD DISTRICT.

This district included the following regular gauging stations:

| Stream | Location | Date Established |
|---|---|---|
| Canyon Creek | NE. 14-6-2-5 | July 6, 1910 |
| Carmichael Ditch | SE. 34-13-29-4 | July 22, 1912 |
| Castle River | SW. 2-7-1-5 | August 5, 1909 |
| Cow Creek | NE. 14-8-2-5 | May 26, 1910 |
| Crowsnest River | SW. 12-8-5-5 | July 28, 1910 |
| Crowsnest River | NE. 36-7-4-5 | July 28, 1910 |
| Crowsnest River | NE. 26-7-2-5 | Sept. 7, 1907 |
| Elton Ditch | NE. 19-8-1-5 | July 10, 1912 |
| Etzikom Coulee | SW. 3-7-19-4 | April 16, 1914 |
| Ford East Ditch | NE. 25-13-1-5 | June 28, 1912 |
| Ford West Ditch | NE. 26-13-1-5 | June 28, 1912 |
| Huff Ditch | NW. 30-8-1-5 | July 11, 1912 |
| McGillivray Creek | SE. 7-8-4-5 | July 23, 1913 |
| Mill Creek | SW. 18-6-1-5 | July 7, 1910 |
| Mosquito Creek | NE. 30-16-28-4 | August 1, 1908 |
| Muddypound Creek | SW. 27-11-28-4 | July 27, 1908 |
| Nanton Creek | SE. 19-16-28-4*d* | August 3, 1908 |

*a* This station was originally located on Sec. 31-21-25-4, but was moved to its present position in May, 1913.
*b* This station was originally located on Sec. 13-21-19-4, but was moved to its present position in May, 1913.
*c* This station was originally located on the SE. 14-17-2-5, but was moved to its present position on July 4, 1912.
*d* This station was originally located on the NE. 13-4-24-4, but was moved to its present position on May 1, 1913.

| Stream | Location | Date Established |
|---|---|---|
| Oldman River | NE. 34-7-1-5 | Sept. 15, 1908 |
| Oldman River | NW. 10-9-26-4 | July 12, 1910 |
| Oldman (Belly ) River | NW. 1-9-22-4 | August 31, 1911 |
| Pincher Creek | SW. 23-6-30-4 | August 13, 1906 |
| Riley Ditch | SW. 17-13-2-5 | |
| St. Mary River | NE. 26-7-22-4 | October 13, 1911 |
| Todd Creek | SW. 19-8-1-5 | August 3, 1909 |
| Trout Creek | SE. 32-11-28-4 | July 7, 1911 |
| Willow Creek | SE. 26-9-26-4 | July 1, 1909 |
| Willow Creek | NE. 20-9-26-4 | August 23, 1915 |

Miscellaneous gaugings were made of Allison Creek (SW. 11-8-5-5), Bellevue Creek (NE. 29-7-3-5), Blairmore Creek (SE. 3-8-4-5), Buchanan Spring (SE. 2-7-1-5), Connelly Creek (SE. 36-7-2-5), Canyon Creek (NW. 5-12-28-4), Castle River (NW. 16-5-3-5), Carbondale River SW. 14-6-3-5), Drumm Creek (NW. 18-7-3-5), Fortier Springs (SE. 17-7-1-5), Gold Creek (SE. 30-7-3-5), Lyon Creek (SE. 35-7-4-5), Nez Percé Creek (SE. 17-8-4-5), Starr Creek (SW. 7-8-4-5), Summit Creek (SW. 12-8-6-5), York Creek (NW. 34-7-4-5), and several other springs and creeks.

The streams in this district rising north of the Crowsnest pass were subject to floods during June, but did little damage.

The installation of an automatic gauge on the Oldman River (NW. 10-9-26-4) was commenced during the fall, and it is proposed to place a Stevens Continuous Water Stage Recorder at this station early in 1916.

Winter records were obtained on Castle River, Crowsnest River (three stations), Oldman River (three stations), St. Mary River and also of most of the creeks shown in the miscellaneous list. The Oldman River (NW. 1-9-22-4) and St. Mary River were added to the Cardston district while the South Saskatchewan River (NW. 31-12-5-4), Swiftcurrent Creek (SW. 12-15-14-3 and NW. 18-15-13-3) and Notukeu Creek were added to the Macleod district.

The field work in this district was in charge of J. E. Caughey, B.Sc., F. R. Steinberger, B.E., P. H. Daniells, B.Sc., and W. R. McCaffrey, B.A.Sc., for various periods and W. R. McCaffrey and W. H. Storey made the final computations for this report.

## CARDSTON DISTRICT.

This district included the following regular gauging stations:

| Stream | Location | Date Established |
|---|---|---|
| Alberta Railway and Irrigation Company Canal | SE. 36-1-25-4 | April 27, 1915 |
| Alberta Railway and Irrigation Company Canal | SE. 21-2-24-4 | July 26, 1910 |
| Alberta Railway and Irrigation Company Canal | NW. 28-4-23-4 | May 1, 1914 |
| Belly River | NE. 5-2-28-4 | Nov. 1, 1911 |
| Belly River | SE. 21-6-25-4 | May 27, 1909 |
| Boundary Creek | NW. 20-1-26-4 | June 18, 1913 |
| Christianson Ditch | SE. 12-3-28-4 | Sept. 14, 1911 |
| Crooked Creek | SW. 22-2-29-4*a* | Sept. 15, 1909 |
| Fidler Brothers' Ditch | SE. 19-1-26-4 | Sept. 13, 1911 |
| Lee Creek | SE. 27-2-26-4*b* | May 5, 1913 |
| Mami Creek | SE. 19-2-27-4 | August 13, 1909 |
| N. B. Milk River | NE. 11-1-23-4*c* | July 21, 1909 |
| S. B. Milk River | SW. 29-37 N. 9 W. P. M. By U.S. G. S. in Montana, U.S.A. | 1905 |
| Pinepound Creek | NE. 29-4-23-4 | April 30, 1914 |
| Pothole Creek | NE. 1-6-22-4 | April 28, 1914 |
| Pothole Creek | NW. 10-5-22-4 | April 27, 1914 |
| Rolph Creek near Kimball | SE. 21-2-24-4 | May 17, 1911 |
| St. Mary River | NW. 25-1-25-4 By A. R. I. Co., | in 1905 |
| Waterton River | NE. 8-2-29-4 | August 26, 1908 |
| Waterton River | NW. 28-6-25-4 | Nov. 5, 1915 |

Miscellaneous gaugings were made on North, South and Middle Branches of Belly River (Montana), Bertha Creek (Waterton Lakes), Blackiston Brook (NE. 30-1-29-4), West Boundary Creek (Waterton Lakes), Boundary Creek (Waterton Lakes), Cameron (Oil) Creek (SW. 23-1-30-4), Cottonwood Creek (20-2-29-4), Drywood River (NW. 18-4-29-4), Hellroaring Creek (Waterton Lakes), Kootenai River (Waterton Lakes), Pine Creek (NW. 21-3-29-4) and Yarrow Creek (14-4-29-4).

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*a* This station was originally located on the SE. 22-2-29-4, but was moved to the SW. 23-2-29-4 on June 15, 1911, and to its present position on October 15, 1912.

*b* A station was maintained on the NW. 10-3-25-4 from June 28, 1909, to July 13, 1914.

*c* This station was originally located on the NE. 13-1-23-4, but was moved to its present position on May 1, 1913.

Winter observations were made on Belly River (two stations), Blackiston Brook, Cameron Creek, Lee Creek, North and South Branches of Milk River, St. Mary River and Waterton River (two stations). In addition, the winter district included Milk River (NE. 21-2-16-4), Oldman River (NW. 1-9-22-4), and St. Mary River (NE. 26-7-22-4).

The stations on St. Mary (NW. 25-1-25-4) and North and South Branches of Milk River are equipped with automatic gauges and are maintained jointly by this branch, with Water Resources Branch of the United States Geological Survey.

A new station was established on Waterton River near its mouth, and a cable installed in November. This will enable us to obtain more complete records of the flow of this stream.

O. H. Hoover, B.A.Sc., J. E. Degnan, V. A. Newhall, B.A.Sc., and W. H. Storey were in charge of this district for various periods. The final computations for the report were made by V. A. Newhall, W. H. Storey and G. H. Whyte.

MILK RIVER DISTRICT.

| Stream | Location | Date Established |
|---|---|---|
| Deer Creek | SW. 15-1-12-4 | May 26, 1911 |
| Deer Creek Cattle Company East Ditch | SW. 36-1-12-4 | April 27, 1912 |
| Deer Creek Cattle Company West Ditch | SW. 36-1-12-4 | April 30, 1914 |
| Etzikom Coulee | SW. 2-5-13-4 | May 28, 1915 |
| Fornfeist Ditch | SW. 31-1-11-4 | Sept. 16, 1915 |
| Hooper and Huckvale North Ditch | SW. 27-4-6-4 | March 7, 1914 |
| Hooper and Huckvale South Ditch | NE. 22-4-6-4 | May 2, 1912 |
| Ketchum Creek | NE. 25-4-7-4 | May 17, 1915 |
| Manyberries Creek | SW. 27-4-6-4*a* | June 17, 1910 |
| Milk River | NE. 21-2-16-4 | May 18, 1909 |
| Milk River | SW. 35-1-13-4 | August 2, 1909 |
| Milk River | SW. 21-2-8-4 | August 5, 1909 |
| Milk River | NE. 6-37 N. 9 E. P. M. Montana, U.S.A.*b* | August 7, 1909 |
| N. Br. Milk River | SW. 19-2-18-4 | July 15, 1909 |
| S. Br. Milk River | NW. 31-1-18-4 | July 14, 1909 |

Miscellaneous gaugings were made of Beargulch (30-2-9-4), Canal Creek (6-4-6-4 and 27-3-6-4), Dead Creek (SW. 22-4-6-4), Deadhorse Creek (4-2-11-4), Deer Creek (NE. 26-1-12-4), Davis Coulee (SE. 35-1-13-4), Irrigation Creek (7-6-5-4), Halfbreed Creek (28-2-10-4), Ketchum Creek (16-4-6-4, 10-4-6-4 and 35-4-7-4), Kennedy Creek (SE. 3-1-5-4), Lost River (11-2-5-4), Manyberries Creek (3-5-7-4 and 31-4-6-4), Macdonald Creek (32-1-11-4), Mackie Creek (19-2-18-4), Miners Creek (11-2-11-4), Police Creek (SW. 35-1-13-4), Red Creek (18-1-15-4), Rocky Coulee (SW. 35-1-13-4), Verdigris Coulee (SE. 29-2-14-4), and several other creeks, springs and coulees.

Winter records were obtained at only one station, Milk River (NE. 21-2-16-4), which was included in Cardston district during the winter period.

The lowest station on Milk River is equipped with an automatic gauge and is maintained in co-operation with the United States Geological Survey.

W. H. Storey was in charge of the field work in this district and made the final computations for this report.

WESTERN CYPRESS HILLS DISTRICT.

This district included the following regular gauging stations:

| Stream | Location | Date Established |
|---|---|---|
| Adams North Ditch | NE. 10-9-27-3 | May 22, 1914 |
| Adams South Ditch | NE. 10-9-27-3 | May 22, 1914 |
| Anderson Ditch | SW. 23-6-3-4 | Sept. 23, 1911 |
| Battle Creek | NE. 33-5-29-3 | June 3, 1909 |
| Battle Creek | NW. 33-5-27-3*c* | July 5, 1910 |
| Battle Creek | NE. 3-3-27-3 | May 11, 1910 |
| Boxelder Creek | NE. 2-12-30-3 | May 24, 1909 |
| Brown Ditch | NW. 31-8-3-4 | October 14, 1915 |
| Bullshead Creek | SW. 4-11-5-4*d* | October 9, 1911 |
| Cheeseman West Ditch | SW. 12-8-29-3 | June 24, 1911 |
| Cheeseman East Ditch | SW. 12-8-29-3 | June 24, 1911 |
| Clark Ditch | SE. 15-9-5-4 | October 15, 1915 |
| M. T. Clark North Ditch | SW. 21-7-3-4 | Sept. 28, 1915 |

*a* This station was originally located on SE. 3-5-6-4, but was moved to its present position on May 2, 1912.
*b* This station was originally located on SE. 3-1-5-4, but was moved to its present position in spring of 1913.
*c* This station was originally located on SW. 2-6-28-3, but was moved to its present position on May 29, 1912.
*d* This station was originally located on NW. 15-9-5-4, but was moved to its present position on May 15, 1915.

| Stream | Location | Date Established |
|---|---|---|
| M. T. Clark South Ditch | SW. 21-7-3-4 | Sept. 28, 1915 |
| Dixon Ditch | SE. 17-12-26-3 | June 4, 1911 |
| English Ditch | SW. 12-7-3-4 | Sept. 29, 1915 |
| Gaff Ditch | SW. 25-5-29-3 | July 11, 1911 |
| Gap Creek | SE. 4-10-27-3 | April 25, 1909 |
| Gilchrist Bros. Ditch | SW. 11-5-27-3 | October 16, 1911 |
| Gordon, Ironsides and Fares Ditch | NW. 7-12-22-3 | June 14, 1915 |
| Gregg Ditch | NE. 34-3-29-3 | July 30, 1915 |
| D. A. Hammond Ditch | NE. 5-2-29-3 | August 2, 1915 |
| Hanckel Ditch | NE. 30-7-3-4 | October 4, 1915 |
| Hartt Ditch | NE. 15-6-3-4 | Sept. 27, 1915 |
| Henry Ditch | NW. 28-5-28-3 | July 7, 1914 |
| Henry Ditch | NW. 34-5-28-3 | July 7, 1914 |
| Lindner Ditch | NW. 10-6-29-3 | July 26, 1910 |
| N. B. Link East Ditch | SW. 32-5-1-4 | July 25, 1914 |
| S. B. Link East Ditch | SW. 32-5-1-4 | July 25, 1914 |
| Link West Ditch | SW. 32-5-1-4 | July 25, 1914 |
| Lodge Creek | SE. 12-1-29-3 | August 13, 1909 |
| E. Br. Lodge Creek | SE. 1-7-3-4 | October 17, 1911 |
| Lynch Ditch | NE. 19-2-29-3 | August 2, 1915 |
| Mackay Creek | NW. 26-11-1-4 | July 29, 1909 |
| Maple Creek | SE. 28-11-26-3 | May 4, 1910 |
| Maple Creek | NE. 5-12-26-3 | April 28, 1915 |
| Marshall and Gaff Ditch | NE. 33-5-29-3 | July 11, 1911 |
| McCann Ditch | NE. 29-5-1-4 | July 13, 1915 |
| McKinnon Ditch | NW. 20-4-26-3 | October 20, 1911 |
| Middle Creek | SW. 30-5-29-3 | July 20, 1909 |
| Middle Creek | NE. 4-2-29-3 | June 13, 1910 |
| Mitchell Upper Ditch | NE. 29-5-2-4 | July 6, 1915 |
| Mitchell Lower Ditch | SE. 15-5-2-4 | July 7, 1915 |
| Mock Ditch | NW. 21-7-2-4 | Sept. 29, 1915 |
| Muir and Frantzen Ditch | SW. 36-5-2-4 | July 6, 1915 |
| Mudie Ditch | NW. 21-7-3-4 | Sept. 28, 1915 |
| Mull East Ditch | NW. 24-7-29-3 | June 9, 1915 |
| Mull West Ditch | NW. 24-7-29-3 | June 9, 1915 |
| Oxarart Creek | NE. 20-6-27-3 | June 15, 1909 |
| Parsonage Ditch | SW. 3-7-29-3 | June 9, 1915 |
| Peachey Ditch | SE. 4-3-29-3 | July 29, 1915 |
| G. Pollock East Ditch | SW. 17-9-27-3 | May 19, 1914 |
| G. Pollock West Ditch | SW. 17-9-27-3 | May 19, 1914 |
| Read Ditch from Michel Coulee | NE. 33-6-3-4 | Sept. 28, 1915 |
| Read Ditch from Read Creek | NE. 34-6-3-4 | Sept. 27, 1915 |
| Richardson Ditch | SE. 2-5-27-3 | October 14, 1911 |
| Sage Creek | NE. 9-1-2-4 | August 10, 1909 |
| Sixmile Coulee | SW. 6-7-28-3*a* | July 22, 1909 |
| Small Ditch | SE. 22-9-27-3 | Nov. 22, 1915 |
| Spangler Ditch near Govenlock | NW. 24-2-30-3 | August 2, 1915 |
| Spangler Ditch from Sixmile Coulee | SW. 6-7-28-3 | July 10, 1911 |
| Starks and Burton Ditch | SE. 17-11-5-4 | October 9, 1911 |
| Stirling and Nash Ditch | SE. 22-3-27-3 | July 11, 1911 |
| Suiste North Ditch | NE. 9-6-3-4 | Sept. 27, 1915 |
| Suiste South Ditch | NE. 4-6-3-4 | Sept. 27, 1915 |
| White Ditch | SW. 1-9-27-3 | June 15, 1911 |
| Wilson Ditch | NE. 34-5-28-3 | June 21, 1911 |
| Wood and Anderson Ditch | NE. 21-7-29-3 | June 20, 1914 |
| Wood and Anderson East Ditch | SE. 22-7-29-3 | June 20, 1914 |
| Wood and Anderson West Ditch | NE. 22-7-29-3 | June 20, 1914 |

It will be noted that a new station was established on Maple Creek below the mouth of Gap Creek and that the station on Maple Creek on the Northeast quarter of Sec. 16, Tp. 11, Rge. 26, W. 3rd Mer., and the station on Gap Creek on the Northeast quarter of Sec. 31, Tp. 11, Rge. 26, W. 3rd Mer., have been abandoned.

At all these stations, with the exception of Sage Creek, some records were obtained. At a number of the ditch stations little or no water was used owing to the very wet season.

No winter records were obtained on any of the streams in this district during 1915.

Miscellaneous gaugings were made of Adams Springs (NW. 32-5-1-4), Link Spring (NW. 32-5-1-4), and a few other coulees and small creeks.

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*a* This station was originally located on NW. 29-7-28-3, but was moved to its present position on July 4, 1911.

Most of the flow of the streams in this district takes place in the early spring during the break up, and the district was covered during this period by three engineers. W. H. Rowley, B.Sc., was in charge of the work on the lower stations on Battle and Willow Creeks; H. R. Carscallen, B.A.Sc., those on the upper waters of Battle and Lodge Creeks; R. J. Srigley and H. B. R. Thompson, for various periods, those north of the Cypress Hills, west of Maple Creek. After the end of the freshet period, Mr. Rowley was in charge of the whole district, and, also made the final computations for this report. Mr Rowley also acted as water-master in this district, but owing to the abundance of rainfall his duties as water-master were very light.

EASTERN CYPRESS HILLS DISTRICT.

This district included the following regular gauging stations:

| Stream | Location | Date Established |
|---|---|---|
| Axton Ditch from Spring Coulee | NE. 26-7-21-3 | July 26, 1913 |
| Barnett Ditch | SE. 17-7-22-3 | July 26, 1915 |
| Barroby Ditch | NE. 33-6-23-3 | August 12, 1913 |
| Bear Creek | SE. 18-11-23-3 | June 22, 1908 |
| Beveridge West Ditch | NW. 18-10-24-3 | June 27, 1914 |
| Belanger Creek | SW. 30-6-25-3*a* | March 31, 1912 |
| Bolingbroke Ditch | NE. 7-7-22-3 | August 11, 1913 |
| Bone Creek | NW. 34-8-22-3 | July 2, 1908 |
| Braniff Ditch | SE. 30-11-23-3 | June 22, 1911 |
| Bridge Creek | SE. 33-10-22-3 | April 8, 1911 |
| Clark and Thompson Ditch | NE. 5-7-21-3 | July 19, 1913 |
| A. M. Cross Ditch | SE. 5-8-22-3 | August 14, 1913 |
| F. Cross Ditch | NW. 15-7-22-3 | Sept. 9, 1911 |
| Cumberland Ditch | SW. 17-11-24-3 | June 27, 1914 |
| Davis Creek | NE. 29-6-25-3 | May 24, 1909 |
| Dimmock Bros. Ditch | SE. 16-11-21-3 | Sept. 2, 1914 |
| Drury Ditch | NW. 19-6-25-3 | Sept. 2, 1914 |
| Fairwell Creek | NW. 30-6-24-3 | June 10, 1909 |
| Fauquier Ditch from Hay Creek | NE. 30-10-25-3 | June 8, 1914 |
| Fearon Ditch | SW. 6-11-24-3 | June 25, 1912 |
| Frenchman River | NE. 23-6-23-3 | October 1911 |
| Frenchman River | SE. 31-6-21-3*b* | July 31, 1908 |
| N. B. Frenchman River | NE. 16-7-22-3 | July 25, 1908 |
| G. R. Hammond East Ditch | SW. 16-10-25-3 | May 26, 1915 |
| G. R. Hammond West Ditch | SW. 16-10-25-3 | May 26, 1915 |
| Hawkin Ditch | SE. 26-9-20-3 | July 9, 1913 |
| Hay Creek | SW. 29-16-25-3 | July 4, 1910 |
| Jones Creek | SE. 20-8-20-3*c* | May 15, 1912 |
| Kearney Bros. Ditch | SE. 19-8-23-3 | Sept. 6, 1913 |
| Lewis Ditch | NW. 34-8-22-3 | July 29, 1915 |
| Mann Ditch | NW. 32-10-22-3 | July 1, 1913 |
| McCarthy, Bertram and Salt, East Ditch | NW. 29-11-23-3 | June 15, 1914 |
| McCarthy, Bertram and Salt, West Ditch | NW. 29-11-23-3 | June 15, 1914 |
| Moorhead Ditch | SE. 25-10-25-3 | June 10, 1911 |
| Morrison Bros. Ditch | SW. 26-6-21-3 | August 22, 1911 |
| Needham Bros. Ditch | SW. 30-11-23-3 | June 22, 1911 |
| Parker North Ditch | SW. 4-9-20-3 | July 15, 1913 |
| Parker South Ditch | SW. 4-9-20-3 | July 15, 1913 |
| Peacock East Ditch | SW. 36-10-26-3 | May 19, 1915 |
| Peacock West Ditch | SW. 36-10-26-3 | May 19, 1915 |
| Piapot Creek | NE. 18-11-24-3*d* | June 17, 1908 |
| D. H. Pollock East Ditch | NW. 22-7-21-3 | August 10, 1911 |
| D. H. Pollock West Ditch | NW. 22-7-21-3 | August 10, 1911 |
| Sinclair Ditch | SE. 18-10-19-3 | |
| Skull Creek | SE. 32-10-22-3*e* | April 8, 1911 |
| C. E. Stearns Ditch | NW. 20-8-20-3 | July 16, 1913 |
| C. E. Stearns Ditch | SW. 20-8-20-3 | July 16, 1913 |
| C. E. Stearns Ditch | SW. 17-8-20-3 | July 16, 1913 |
| Stearns Bros. South Ditch | SW. 9-9-20-3 | July 21, 1915 |
| Stearn Bros. North Ditch | SW. 9-9-20-3 | July 21, 1915 |
| Strong Ditch | NE. 25-6-22-3*f* | July 31, 1908 |

*a* This station was originally located on the SW. 30-6-25-3, but was moved to its present location on August 1, 1915.
*b* This station was originally located on the NE. 31-6-21-3, but was moved to its present position on August 21, 1914.
*c* A station on this stream was previous to 1912 maintained on Sec. 5-8-20-3.
*d* This station was originally located on the SW. 17-11-24-3, but was moved to its present position on May 13, 1909.
*e* This station was originally located on the NE. 29-10-22-3, but was moved to its present location on September 1, 1915.
*f* This station was originally located on Sec. 36-6-22-3, but was moved to its present location on April 17, 1911.

| Stream | Location | Date Established |
|---|---|---|
| Sucker Creek | NW. 24-6-26-3 | May 26, 1909 |
| Swiftcurrent Creek | SW. 22-7-21-3 | May 18, 1909 |
| Swiftcurrent Creek | NE. 18-10-19-3 | June 15, 1910 |
| Swiftcurrent Creek | NW. 17-10-19-3 | May 27, 1910 |
| F. T. White Ditch | SW. 12-9-22-3 | July 25, 1913 |

Miscellaneous gaugings were made of Blacktail Creek (30-6-23-3), Calf Creek (SE. 5-8-22-3), Concrete Coulee (11-7-23-3), Doyle Coulee (17-7-23-3), Frenchman River (several points), Petrified Coulee (30-6-23-3), Saunders Springs near Maple Creek and several other small springs and streams.

The only winter records obtained in this district were on Saunders Springs.

During 1915 the streams in this district maintained flows which were well above the average.

The early spring flow of streams in this district was obtained by two engineers, M. H. French having charge of the work south, and J. E. Caughey, B.Sc., that north of the Cypress Hills. J. E. Caughey had charge of the field work during the balance of the year. J. E. Caughey, I. R. Strome and G. H. Whyte made the final computations for the annual report.

### WOOD MOUNTAIN DISTRICT.

This district included the following regular gauging stations:

| Stream | Location | Date Established |
|---|---|---|
| Bate Creek | NW. 6-6-16-3 | April 16, 1914 |
| Bigbreed Creek | NW. 3-2-11-3*a* | March 30, 1914 |
| Bowery Ditch from Rocky Creek | Near Barnard, Montana, U.S.A. | April 30, 1914 |
| Frenchman River | SE. 27-5-16-3 | April 10, 1914 |
| Frenchman River | NW. 24-1-11-3*b* | March 29, 1914 |
| Horse Creek | Near Barnard, Montana, U.S.A. | May 1, 1914 |
| Littlebreed Creek | NW. 11-2-11-3 | March 31, 1914 |
| McEachran Creek | SW. 6-1-7-3 | May 1, 1914 |
| Mule Creek | SW. 33-5-17-3 | April 15, 1914 |
| Rock Creek | Near Barnard, Montana, U.S.A. | April 30, 1914 |
| Snake Creek | SW. 16-4-13-3 | April 17, 1914 |

Winter records were not obtained on any of these streams.

Miscellaneous gaugings were made of several small streams and springs.

Owing to the fact that this district is not very well settled, it is not possible to obtain satisfactory and continuous observations of gauge heights at some of the stations.

F. R. Steinberger, B. E., was in charge of the field work in this district and W. H. Storey, C. H. Giffen and G. H. Whyte made the computations for the annual report.

### SASKATOON DISTRICT.

This district included the following regular gauging stations:

| Stream | Location | Date Established |
|---|---|---|
| Battle River | NW. 25-43-17-3*c* | May 23, 1914 |
| Bridge Creek | SE. 23-13-19-3 | Mar. 29, 1911 |
| Little Red River | SW. 26-49-26-2 | July 14, 1915 |
| Long Creek | SE. 10-2-8-2 | June 22, 1911 |
| Moosejaw Creek | NE. 24-11-19-2 | June 21, 1911 |
| Moosejaw Creek | NW. 16-16-26-2 | April 7, 1910 |
| Moose Mountain Creek | NE. 15-3-2-2 | Sept. 4, 1913 |
| North Saskatchewan River | SW. 33 and NE. 29-43-16-3 | May 16, 1911 |
| North Saskatchewan River | River Lot No. 76, Prince Albert Settlement | October 2, 1911 |
| Notukeu Creek | NW. 10-11-10-3 | August 7, 1914 |
| Qu'Appelle River | NW. 33-19-21-2 | May 12, 1911 |
| Sandy Creek | SE. 29-17-29-2 | August 1, 1915 |
| South Saskatchewan River | SW. 28-36-5-3 | May 27, 1911 |
| Souris River | NE. 11-2-8-2 | June 23, 1911 |

*a* This station was originally located on SE. 15-2-11-3, but was moved to its present location on April 20, 1915.

*b* This station was originally located on the NW. 3-2-11-3 but was moved to its present location on September 22, 1915, as no observer was available at the upper location.

*c* A station was previously maintained on this stream on the SE. 19-43-17-3.

| Stream | Location | Date Established |
|---|---|---|
| Souris River | NE. 36-2-1-2 | June 26, 1911 |
| Souris River | SW. 6-4-26-1*a* | July 20, 1911 |
| Spring No. 1 | NW. 32-12-18-3 | April 9, 1915 |
| Spring No. 2 | NE. 27-12-19-3*b* | March 13, 1915 |
| Swiftcurrent Creek | SW. 12-15-14-3 | Jan. 16, 1914 |
| Swiftcurrent Creek | NW. 18-15-13-3*c* | April 30, 1910 |

Miscellaneous gaugings were made of springs in the vicinity of Gull Lake, Souris River at Weyburn and North Saskatchewan River at LaColle Falls, and of several other streams and springs.

Winter records were obtained on all the regular stations in this district, except Bridge Creek, Moosejaw Creek (NE. 24-11-19-2), Moose Mountain Creek and Souris River (NE. 36-2-1-2). The stations west of Moosejaw were included in Macleod district during the winter period.

The floods on the larger streams in this district during July added much to the office and field work.

F. R. Steinberger, B.E., E. W. W. Hughes and F. K. Beach, A.M. Can. Soc. C.E., were in charge of the field work in this district. The final computations for the report were made by F. K. Beach and I. R. Strome.

### EDMONTON DISTRICT.

This district included the following regular gauging stations:

| Stream | Location | Date Established |
|---|---|---|
| Athabaska River | SE. 20-66-22-4 | Feb. 23, 1913 |
| Battle River | SW. 4-43-25-4 | May 7, 1913 |
| Clearwater River | SE. 16-39-7-5 | June 3, 1913 |
| Pigeon Creek | SE. 15-46-28-4 | August 7, 1914 |
| Red Deer River | SE. 20-38-27-4 | Dec. 2, 1911 |
| North Saskatchewan River | NE. 21-39-7-5 | June 2, 1913 |
| North Saskatchewan River | River Lot No. 17, Edmonton Settlement, NW. 33-52-24-4 | May 14, 1911 |
| Sturgeon River | Bet. River Lots 27 and 52, St. Albert Settlement | April 23, 1913 |
| Sturgeon River | NW. 28-55-22-4 | Dec. 30, 1913 |

Miscellaneous gaugings were made of Blindman River (NW. 15-39-27-4), Brazeau River (19-45-10-5), Buck Creek (SE. 23-47-6-5), Nordegg River (SE. 24-45-10-5), and North Saskatchewan River (26-45-9-5).

All stations in this district were maintained throughout the winter 1914-15, and all but Pigeon Creek and Sturgeon River at St. Albert during the Winter of 1915-16. During the Winter of 1914-15, the stations in this district in the vicinity of Edmonton were included in the Jasper district and those in the south in Calgary winter district. In the winter of 1915-16 the southern streams were again included in the Calgary district, and the northern with the Peace River district.

Floods on these streams in June and July did much damage to private property and also destroyed the cable stations on the North Saskatchewan River, and Clearwater River near Rocky Mountain House. These were re-established in September.

Miscellaneous gaugings in the vicinity of the mouth of Brazeau River were made by H. B. R. Thompson during January and March.

I. R. Strome, B.A.Sc., R. J. McGuinness, P. H. Daniells, B.A.Sc., J. M. Paul, B.A., B.E., and C. M. O'Neil, B.A.Sc., were in charge of the field work in this district for various periods, and I. R. Strome made the final computations for the annual report.

### NORDEGG DISTRICT.

This district included the following regular gauging stations:—

| Stream | Location | Date Established |
|---|---|---|
| Bighorn River | Sec. 18-39-16-5 | June 15, 1915 |
| South Branch of Brazeau River | Sec. 18-43-16-5 | August 27, 1915 |
| Brown Creek | Sec. 2-44-17-5 | August 28, 1915 |
| Chungo Creek | Sec. 13-43-17-5 | August 26, 1915 |

*a* This station was discontinued on July 31, 1915, as the Manitoba Hydrographic Survey established a station at this point.

*b* This station was discontinued on June 29, 1915.

*c* This station was originally located on the SW. 10-15-14-3, but was moved to its present position on May 5, 1913.

| Stream | Location | Date Established |
|---|---|---|
| Cline River | Sec. 7-37-18-5 | June 18, 1915 |
| Martin Creek | Sec. 27-40-15-5 | June 12, 1915 |
| Mistaya River | Sec. 33-34-20-5 | June 27, 1915 |
| North Saskatchewan River | Sec. 23-36-18-5 | May 15, 1915 |
| North Saskatchewan River | Sec. 14-40-13-5 | August 4, 1915 |
| Ram River | Sec. 13-39-11-5 | August 10, 1915 |
| Shunda Creek | Sec. 21-40-13-5 | June 1, 1915 |
| Siffleur River | Sec. 31-35-17-5 | May 17, 1915 |
| Southesk River | SW. 6-43-20-5 | Sept. 2, 1915 |
| Whiterabbit Creek | Sec. 23-36-18-5 | May 16, 1915 |

Miscellaneous measurements were made of Blackstone Creek (SW. 12-42-19-5), South Brazeau River (44-15-5), Brazeau River (39-22-5), Careless Creek (35-18-5), Coral Creek (37-19-5), Corral Creek (37-25-5), George River (NW. 1-42-19-5), Glacier River (34-11-5), Goat Creek (35-18-5), Haven Creek (39-14-5), Mistaya River (32-18-5), Mud Creek (42-16-5), North Saskatchewan River (Brazeau Gap, 33-21-5 and 34-20-5), and a number of other small springs and streams.

Observations of gauge height were made at the regular stations for various periods and throughout the winter on Martin Creek, Shunda Creek and North Saskatchewan River (Sec. 14-40-13-5).

Cables were erected on the North Saskatchewan (two stations), and a temporary cable was used to make measurements on many other streams.

This district was established in 1915 under the charge of O. H. Hoover, B.A.Sc., who installed and maintained the stations as well as carrying out a reconnaissance of the head waters of the North Saskatchewan River. Mr Hoover also made the final computation for the annual report, and a description of the field work and district is given in a report by Mr. Hoover, which will be included in the Appendix to this report.

### JASPER (ATHABASKA) DISTRICT.

This district included the following regular gauging stations:

| Stream | Location | Date Established |
|---|---|---|
| Athabaska River | NW. 15-45-1-6 | Mar. 4, 1913 |
| Athabaska River | SE. 8-51-25-5 | May 4, 1915 |
| Lobstick River | NE. 30-53-7-5 | July 11, 1913 |
| Maligne River | SW. 1-46-1-6 | June 17, 1914 |
| McLeod River | NW. 3-54-16-5 | May 18, 1914 |
| Miette River | SW. 9-45-1-6 | August 23, 1913 |
| Pembina River | SW. 20-53-7-5 | Dec. 19, 1913 |
| Rocky River | NW. 13-48-28-5 | July 3, 1913 |
| North Saskatchewan River | NE. 10-49-7-5 | June 20, 1915 |
| Sturgeon River | SW. 14-54-5-5 | April 21, 1914 |
| Sturgeon River | SE. 7-55-2-5 | April 23, 1914 |
| Sturgeon River | NW. 32-54-26-4 | April 22, 1914 |

Miscellaneous gaugings were made of Embarras River (SW. 5-52-18-5), Fiddle Creek (SE. 15-49-27-5), Happy Creek (SE. 14-51-25-5), Hardisty Creek (SE. 24-51-25-5), Maligne River (SW. 33-45-28-5), Prairie Creek (SE. 8-51-25-5), Snaring River (NW. 33-46-1-6), Stony River (NW. 26-48-28-5), Sundance Creek (NW. 3-53-18-5), Wolf Creek (SW. 3-54-16-5), and on several other small streams and springs.

Winter records were obtained on all streams in this district except Sturgeon River (three stations).

Floods prevailed on most of the streams in this district during June, but did not do any great amount of damage.

Continuous gauge height observations cannot be obtained at many of the stations owing to the country being very sparsely settled.

P. H. Daniells, B.Sc., R. J. McGuinness and J. M. Paul, B.A., B.E., were in charge of the field work for various periods and J. M. Paul, A. B. Cook and F. S. Dyke made the final computations for the annual report.

### PEACE RIVER DISTRICT.

This district included the following regular gauging stations:

| Stream | Location | Date Established |
|---|---|---|
| North Heart River | NW. 27-83-21-5 | May 31, 1915 |
| Lesser Slave River | SW. 7-73-5-5 | May 20, 1915 |
| Peace River | NW. 27-83-21-5 | May 26, 1915 |
| Peace River | SE. 23-108-13-5 | August 8, 1915 |
| Smoky River | SW. 10-78-24-5 | June 4, 1915 |
| Swan River | NE. 23-73-10-5 | May 19, 1915 |

Gauges are also maintained on Lesser Slave Lake, on Sec. 19-75-14-5 and SW. 15-73-6-5.

Miscellaneous gaugings were made of Battle River (96-20-5), Buffalo River (102-20-5), Cadotte River (19-89-21-5), South Heart River (SW. 31-75-16-5), East Prairie River (SW. 11-74-16-5), West Prairie River (SW. 14-74-17-5), Little Smoky River (15-77-14-5), and Whitemud River (25-88-21-5).

This district was started in 1915 and P. H. Daniells, B.Sc., was in charge of the field work, establishing and maintaining stations as well as conducting a reconnaissance of the whole district. Most of the discharge measurements were made from a boat or ferry. A full description of this work and district is given in Mr. Daniells' report for 1915, which will be found in the appendix to this report.

Winter work has been carried out in this district under I. R. Strome and C. M. O'Neil on all streams in this district, except Swan River and Peace River (NW. 18-108-11-5), the latter station being in charge of P. H. Daniells, who is making a special study of the winter flow at that point.

The final computations for the annual report were made by P. H. Daniells, I. R. Strome and O. H. Hoover.

### SPECIAL INVESTIGATIONS.

During 1915, special investigations were made by a party of engineers consisting of R. J. McGuinness, representing the Calgary Office, C. L. Dodge, B.Sc., representing the Department of Natural Resources, Canadian Pacific Railway Company, and L. E. Kendall, B.Sc., representing the Ottawa Office, for the purpose of determining the value of the co-efficient "n" in Kutter's formula for Secondary Canal "A," in the Western Section of the Canadian Pacific Railway Company's Irrigation Block.

Three typical sections of the canal, where no water was diverted, were chosen for these investigations. Each was studied separately, and every care was taken to secure accurate records. The velocities and discharges at each end of each section were determined by frequent current-meter observations and the use of automatic water stage registers. The cross-sections, wetted perimeters, and slopes of the canal were carefully measured with suitable instruments, for several stages of the canal. Descriptions of the canal were also carefully recorded.

These investigations were carried out for several stages of the canal at each section, but owing to the impossibility of filling the canal to its capacity at that time, the results are inconclusive and only a progress report was submitted. Further investigations will therefore have to be made at a later date to complete the work. No report of the results of the investigations was therefore prepared for publication with this report.

After the above work, R. J. McGuinness and L. E. Kendall, with the co-operation of the Department of Natural Resources of the Canadian Pacific Railway Company, continued the study of the absorption losses in the Alberta Railway and Irrigation Company's canals near Lethbridge. By the use of current-meters and automatic water stage registers, continuous records of the flow at each end of the experimental sections were obtained, and the absorption losses in cubic feet for a certain period were determined.

A progress report upon this work was also submitted, but further investigations will be made before a final report is submitted for publication.

### CURRENT-METER RATING STATION.

The engineer in charge of the rating station also had charge of the following regular gauging stations:

| Stream | Location | Date Established |
|---|---|---|
| Bow River | NE. 15-24-1-5 | Nov. 25, 1910 |
| Canadian Pacific Railway Company Canal | NE. 21-23-29-4 | May 18, 1911 |
| Elbow River | SW. 14-24-1-5 | May 8, 1908 |
| Nose Creek | NW. 13-24-1-5 | April 24, 1911 |

In addition to these stations, gauges were maintained on the Bow River during the open water season, on the SW. 14-24-1-5, NE. 1-24-1-5, SW. 26-23-1-5, and SW. 13-23-1-5, for the Water Power Branch.

Winter records were obtained on the Bow and Elbow Rivers, they being included in the Calgary winter district.

The rating station was operated from April 8 to November 15. During this time seventy-five meters were rated, fifty-six for this branch, nine for the British Columbia Hydrographic Survey, three for the Water Rights branch of British Columbia, four for the Manitoba Hydrographic Survey, one for the Water Power Branch, one for the Canadian Pacific Railway Company and one for the Department of Public Works of Canada.

The field and office work was under the charge of H. M. Nelson.

DEPARTMENT OF THE INTERIOR

HYDROMETRIC SURVEYS - 1915 - PLATE NO 2.

GAUGE HEIGHT-DISCHARGE, GAUGE HEIGHT-MEAN VELOCITY AND GAUGE HEIGHT-AREA CURVES

FOR

BOW RIVER

NEAR

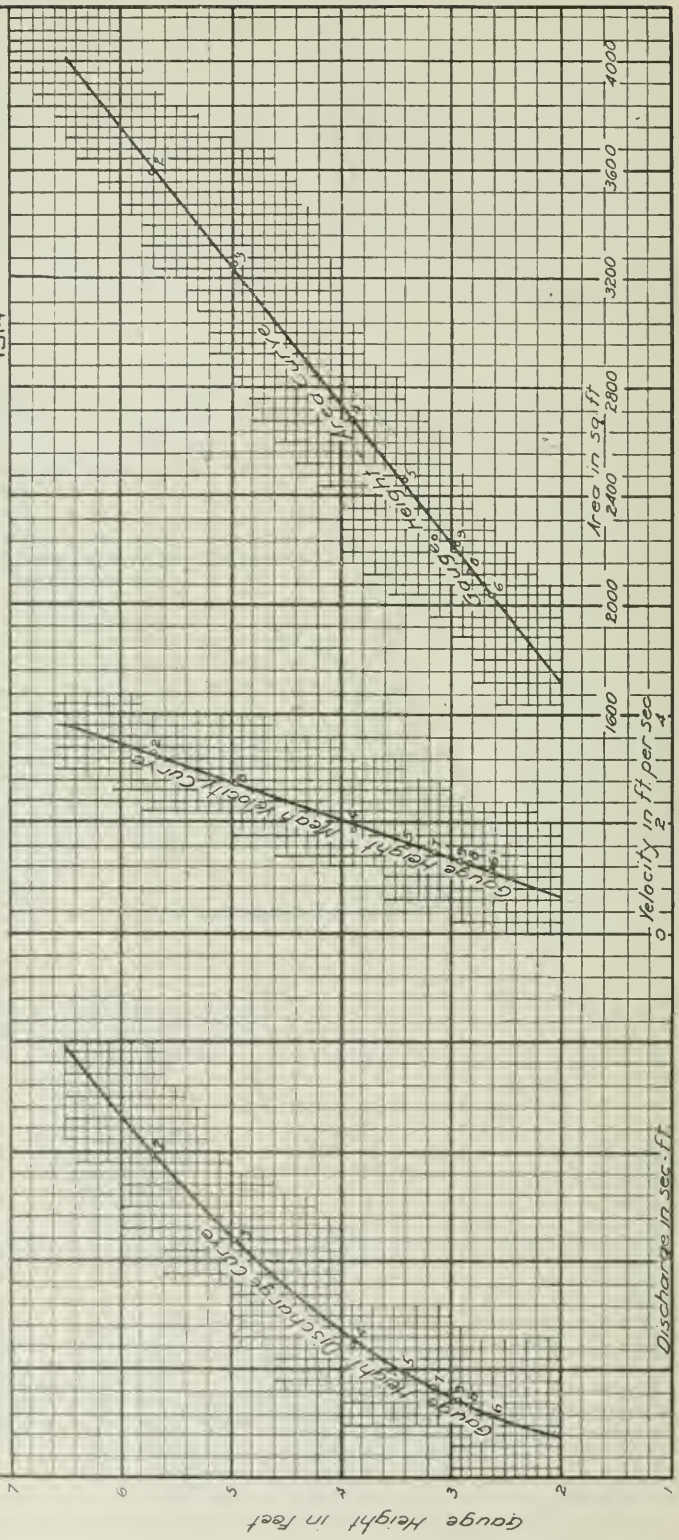
BASSANO ALBERTA

SE ¼ SEC 2, TP. 21 RGE 19 W. OF 4TH. MER.

FOR

1914

| No | Date | Area | M.V. | G.H. | Dis |
|---|---|---|---|---|---|
| 2 | June 7 | 3597 | 3.29 | 5.71 | 11830 |
| 3 | " 23 | 3249 | 2.69 | 4.96 | 8750 |
| 4 | July 27 | 2676 | 1.84 | 3.90 | 4902 |
| 5 | Aug 25 | 2458 | 1.57 | 3.41 | 3851 |
| 6 | Sept 15 | 2035 | 1.10 | 2.64 | 2244 |
| 7 | Oct. 10 | 2252 | 1.45 | 3.16 | 3278 |
| 8 | " 28 | 2119 | 1.23 | 2.84 | 2601 |
| 9 | Nov 27 | 2220 | 1.26 | 2.94 | 2802 |



BENCH-MARKS.

When the stream measurement work was first started, the gauges were usually referred to bench-marks on wooden stakes or stumps of trees. These were easily shifted or destroyed and were not satisfactory. In 1911, an iron bench-mark was adopted by this branch, and now almost all the gauges are either referred to bench-marks on concrete piers or other permanent structures, or to one of these iron bench-marks. Whenever an opportunity is afforded these are tied to the Canadian Pacific Railway or Dominion Government levels, to determine their elevation above sea level, and they are therefore also a convenient reference for local levelling operations.

Description of the iron bench-marks are given in the Report of the Progress of Stream Measurements for 1911 and 1912.

OFFICE WORK.

As above intimated, the reports of the gauge height observers and the engineers are transmitted to the office by mail. These are copied to office forms and filed in a cabinet, which is carefully indexed and where they can be referred to at any time without trouble. As the engineers complete their computations, the results are entered on convenient forms and filed in the same cabinet.

A cabinet made up of four styles of drawers is used for filing the records. The top section is used for filing the gauge height books of the observers and the current-meter notes of the engineers. The gauge height books and current-meter notes are filed alphabetically, according to the names of the streams. The next section contains the postal cards sent in by the observers and these are also filed alphabetically according to the names of the streams. The third section is made up of map drawers and contains the gauge height-area, gauge height-mean velocity and gauge height-discharge curves, and plotted cross-sections, which are filed alphabetically, according to the names of the streams. The same section contains the maps showing the outlines of the drainage basins, filed numerically according to the number of the sectional sheet. The rating curves for the current-meters are also filed in this section numerically, according to the office numbers of the current-meters. The bottom section of the cabinet consists of letter size pockets, alphabetically arranged for each gauging station. The tables of gauge heights, discharge measurements, daily gauge height and discharge, monthly discharge, a description of the station and memoranda of any changes are filed in these pockets. The different rating tables for each meter are also filed numerically in this section and another drawer contains the daily and monthly reports of the meteorological service.

The copying and filing of the reports of the gauge height observers and the engineers is entrusted to the office recorder. While doing this he carefully examines all records to see that there are no errors, and where there are doubtful or impossible records, it is his duty to have the data corrected or ascertain the cause of the unusual condition. He also makes out the pay list for the observers and conducts the correspondence relating to the records.

All computations are checked before being used or published. For this reason, as far as possible, men with some technical education, or students in science, are engaged as helpers. The discharge measurements are computed by the helper and his work is checked by the engineer. In some instances, where there is a great deal of driving and camping out, the engineer cannot secure a helper who can compute discharges, and in that case he computes the discharges himself and his computations are checked in the office.

Gaugings of the flow under ice are usually made by using the multiple point method, and vertical velocity curves have to be plotted to determine the mean velocity in the vertical.

The computation by this method is long and tedious and cannot be done by the engineer in the field. There are, therefore, a great many computations to be made in the office and the services of a computer are required.

G. H. Nettleton, the regular recorder, went on Active Service early in 1915, and W. K. Broughton therefore filled the position of office recorder and J. B. Gray that of office computer, during 1915.

The results of the discharge measurements are plotted on cross-section paper by one of the assistant engineers as soon as they are received in the office, and thus a very close check is kept on the records, and errors can be detected at once and in most cases can be rectified. At the same time the records are kept up to date and demands for provisional estimates can be met at an early date. Important changes in the flow are also detected at once and instructions are issued without delay to the field engineers to obtain further gaugings. The first and second assistants to the Chief Hydrometric Engineer supervise the office and field work by constantly checking and inspecting it and also do considerable work in the preparation of the annual and special reports.

P. M. Sauder, D.L.S., M. Can. Soc. C.E., occupies the position of Chief Hydrometric Engineer, and during 1915, G. H. Whyte and G. R. Elliott, D.L.S., B.A.Sc., A.M. Can. Soc. C.E., were respectively the first and second assistants to the Chief Hydrometric Engineer. In August Mr. Elliott went on Active Service, as a Lieutenant in the Divisional Cyclists. He was not replaced, but on January 1, 1916, G. H. Whyte and N. M. Sutherland were appointed Divisional Hydrometric Engineers, and had charge of the preparation of most of the records for this report.

FUTURE WORK.

During 1916, a special effort is being made to again obtain the total spring run-off of the main streams in the Cypress Hills and of Pakowki Lake drainage basin. The records obtained in former years on these streams are of especial value and no doubt those of 1916 will be just as valuable.

While the districts will be re-arranged and a few unimportant stations discontinued, practically all the regular work will be continued during 1916.

The investigations of absorption losses in irrigation canals will also be continued.

Parties will again be placed on the headwaters of the North Saskatchewan River and in the Peace River district. In both these districts there are water power sites, and records of the flow are required to determine the possibilities. Ordinary transportation facilities are not available in either district. The engineer on the headwaters of the North Saskatchewan River will therefore have to use pack ponies and the one in Peace River district will probably use boats or canoes.

DEFINITIONS.

The volume of water flowing in a stream is known as run-off or discharge. In expressing it various units are used, depending upon the kind of work for which the data is needed. Those used in this report are " second-foot," " acre-foot," " run-off per square mile " and " run-off in depth in inches " and may be defined as follows:

" Second-foot " is an abbreviation for cubic foot per second, and is the body of water flowing in a stream one foot wide and one foot deep at the rate of one foot per second.

The " acre-foot " is the unit capacity used in connection with storage for irrigation work and is equivalent to 43,560 cubic feet. It is the quantity required to cover an acre to a depth of one foot.

The expression " second-feet per square mile " means the average number of cubic feet of water flowing each second from every square mile of drainage area on the assumption that the run-off is uniformly distributed.

" Depth in inches " means the depth of water in inches that would have covered the drainage area, uniformly distributed, if all the water could have accumulated on the surface. This quantity is used for comparing run-off with rainfall, which quantity is usually given in depth in inches.

It should be noticed that " acre-feet " and " depth in inches " represent the actual quantities of water which are produced during the periods in question, while " second-feet," on the contrary, is merely a rate of flow per second.

EXPLANATION AND USE OF TABLES.

The data obtained and the estimates made therefrom have been compiled in tabulated form and for each regular gauging station are given, as far as available, the following data:

1. Description of station.
2. List of discharge measurements.
3. Table of daily gauge heights and discharges.
4. Table of monthly discharges and run-off.

The description of stations gives such general information about the locality and equipment as would enable the reader to find and use the station. It also gives, as far as possible, complete history of all the changes that have occurred since the station was established and that might affect the records in any way.

The list of discharge measurements gives the results of all the discharge measurements that have been made at or in the vicinity of the gauging station, or have been used in completing the records for the gauging station. It gives the date on which the measurement was made, the name of the engineer, the width and area of cross-section, the mean velocity of the current, the gauge height and the discharge in second-feet.

The table of daily gauge heights and discharges given in this report is a combination of two tables kept in the office of the survey, namely the table of daily gauge heights and the station rating table. The table of daily gauge heights gives the daily fluctuations of the surface of the water above the zero of the gauge, as reported by the observer. During high water, two observations of the gauge were made at some stations and the gauge height given in the table is the mean of the observations for the day. Where automatic gauges are maintained the records given are the mean stage for the day. The discharge measurements and gauge heights are the base data from which the other tables are computed. The table of daily discharges is the discharge in second-feet, corresponding to the stage of the stream, as given by the station rating table.

In the table of monthly discharge the column headed " maximum " gives the mean flow for the day when the mean gauge height was highest. As the gauge height is the mean for the day, there might have been short periods when the water level and the corresponding discharge were higher than given in this column. Likewise, in the column " minimum " the quantity given is the mean flow for the day when the mean gauge height was lowest. The column headed " mean "

is the average flow for each second during the month. The computations for the quantities in the remaining columns have been based upon this mean. The drainage area for each gauging station was marked off on the sectional maps of the department and the area taken off with a planimeter. In many districts, information regarding topographical features is very incomplete and the computed areas are only approximate. As the surveys of the department are extended and completed, these computations will be checked and, if necessary, corrected.

### CONVENIENT EQUIVALENTS.

The following is a list of convenient equivalents for use in hydraulic computations:—

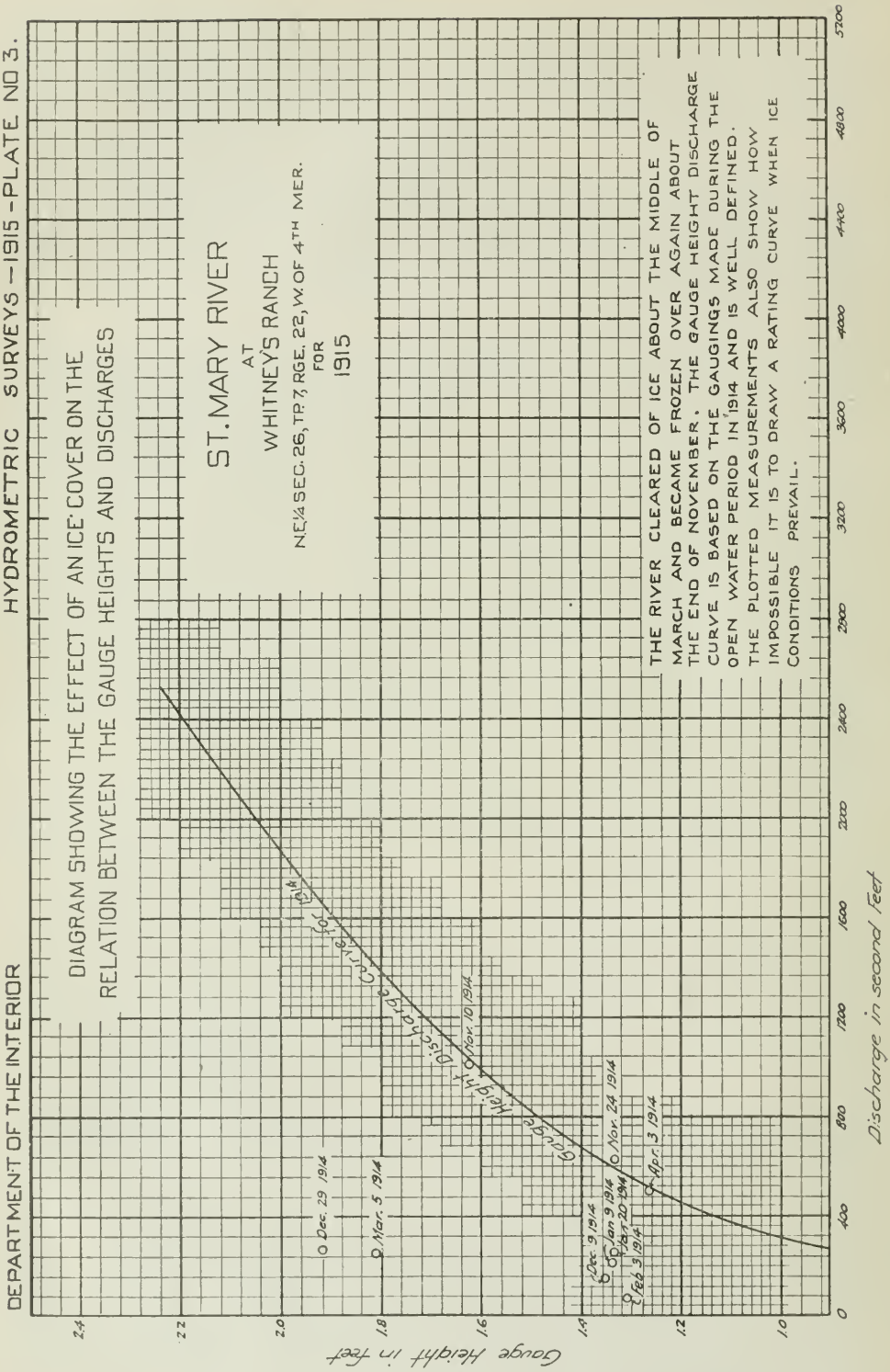
1 cubic foot equals 6.23 British Imperial gallons.
1 cubic foot equals 7.48 United States gallons.
1 acre equals 43,560 square feet; equals 4,840 square yards.
1 acre-foot equals 43,560 cubic feet.
1 acre-foot equals 271,472 British Imperial gallons.
1 acre-foot equals 325,850 United States gallons.
1 inch deep on 1 square mile equals 2,323,200 cubic feet.
1 inch deep on 1 square mile equals 0.0737 second-feet per year.
1 second-foot equals 6.23 British Imperial gallons per second; equals 373.8 gallons per minute: equals 538,272 gallons for one day.
1 second-foot equals 7.48 United States gallons per second; equals 448.8 gallons per minute: equals 646,272 gallons for one day.
1 second-foot equals about 1 acre-inch per hour.
1 second-foot for one day equals 1.983 acre-feet.
1 second-foot for one 28-day month equals 55.54 acre-feet.
1 second-foot for one 29-day month equals 57.52 acre-feet.
1 second-foot for one 30-day month equals 59.50 acre-feet.
1 second-foot for one 31-day month equals 61.49 acre-feet.
1 second-foot for 153 days equals 303.47 acre-feet.
1 second-foot for one year equals 724 acre-feet.
1 second-foot for one 28-day month covers 1 square mile 1.041 inches deep.
1 second-foot for one 29-day month covers 1 square mile 1.079 inches deep.
1 second-foot for one 30-day month covers 1 square mile 1.116 inches deep.
1 second-foot for one 31-day month covers 1 square mile 1.153 inches deep.
1 second-foot for 153 days covers 150 acres 24,278 inches or 2.023 feet deep.
1 second-foot for one year covers 1 square mile 13,572 inches or 1.131 feet deep.
100 British Imperial gallons per minute equals 0.268 second-feet.
100 United States gallons per minute equals 0.223 second-feet.
1,000,000 British Imperial gallons per day equals 1.86 second-feet.
1,000,000 United States gallons per day equals 1.55 second-feet.
1,000,000 British Imperial gallons equals 3.68 acre-feet.
1,000,000 United States gallons equals 3.07 acre-feet.
1,000,000 cubic feet equals 22.95 acre-feet.
1 foot per second equals 0.682 miles per hour.
1 cubic foot of water weighs 62.5 pounds.
1 horse-power equals 550 foot-pounds per second.
1 horse-power equals 746 watts.
1 horse-power equals 1 second-foot falling 8.80 feet.
1⅓ horse power equals 1 kilowatt.
1 British Columbia miner's inch equals 1.68 cubic feet per minute, or 1 second-foot approximately equals 35.7 British Columbia miner's inches.

To calculate water power quickly: $\frac{\text{sec. ft. x fall in feet}}{11}$ = net horsepower on water wheel, realizing 80 per cent of the theoretical power.

To find the number of acre-feet required for a certain acreage under the prescribed duty of water of one hundred and fifty acres for each cubic foot of water per second flowing continuously during the irrigation season (153 days), multiply the acreage by 2.02314.

### METHODS OF MEASURING STREAM FLOW.

There are three distinct methods of determining the surface flow of streams: (1) by measurements of slope and cross-section and the use of Chezy's and Kutter's formulae; (2) by means of weirs, which include any device or structure that by measuring the depth on a crest or sill of known length and form, the flow of water may be determined; (3) by measuring the velocity of the current and the cross-section. The third method is the one most commonly used by this survey. The second is used when the flow is too small to be accurately determined by the third, while the first is only used in making estimates of the discharge of a stream when the only data available are the cross-section and slope.


DEPARTMENT OF THE INTERIOR
HYDROMETRIC SURVEYS—1915—PLATE NO 3.
DIAGRAM SHOWING THE EFFECT OF AN ICE COVER ON THE RELATION BETWEEN THE GAUGE HEIGHTS AND DISCHARGES
ST. MARY RIVER
AT
WHITNEY'S RANCH
NE¼ SEC. 26, TP. 7, RGE. 22, W. OF 4TH MER.
FOR
1915
THE RIVER CLEARED OF ICE ABOUT THE MIDDLE OF MARCH AND BECAME FROZEN OVER AGAIN ABOUT THE END OF NOVEMBER. THE GAUGE HEIGHT DISCHARGE CURVE IS BASED ON THE GAUGINGS MADE DURING THE OPEN WATER PERIOD IN 1914 AND IS WELL DEFINED. THE PLOTTED MEASUREMENTS ALSO SHOW HOW IMPOSSIBLE IT IS TO DRAW A RATING CURVE WHEN ICE CONDITIONS PREVAIL.
Gauge Height Discharge Curve for 1914
Dec. 29 1914
Mar. 5 1914
Mar. 10 1914
Nov. 24 1914
Dec. 9 1914
Jan 9 1914
Jan 20 1914
Feb 3 1914
Apr. 3 1914
Gauge Height in feet
Discharge in second feet
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0
400
800
1200
1600
2000
2400
2800
3200
3600
4000
4400
4800
5200

Slope Method of Determining Discharge.—The slope of a stream, or rather of a section of a stream, is the difference in elevation between the upper and lower ends of the section, commonly called the fall, divided by the distance or the length of the section. Slope sections vary in length from a few hundred feet to several thousand feet, depending largely upon the nature of the stream.

It is difficult to ascertain accurately the slope of the water surface in a stream, since in nearly all streams there are pulsations in the water, causing the surface to rise and fall locally. In most streams the slope of the bottom is far from uniform, and the flow of water in any given section is more or less influenced by the flow in the adjacent section, above or below. For this reason it is a good plan to consider a number of adjacent sections, comprising a considerable length of the stream in one computation, being careful to take into account the diversity of cross-section at various places in the length, and the fact that the slope of the water surface of a stream becomes more uniform during high water and flood stages.

In determining the slope of the surface of a stream, levels are taken of the water surface at each end of the slope section, and referred to some datum or bench-mark. A good plan is to set firmly a stout wooden stake below the water surface at each end of the slope section, and then to drive a nail into the top of each stake, so that the nail-head will exactly coincide with the water surface. The difference in elevation between the two nail-heads, divided by the distance between the stakes, will give the slope.

The wetted perimeter is that portion of a stream channel that is in contact with the water. The form or outline of the wetted perimeter of a stream has an important influence upon the velocity of the current. It is usually determined graphically from the plotted cross-section or may be measured by means of a flexible tape or chain after the flood has subsided.

The hydraulic radius, which is sometimes called the mean radius of the channel below the water surface is found by dividing the area of the cross-section (in sq. ft.) by the length of the wetted perimeter (in feet).

The Chezy formula, which is the fundamental formula for stream discharge, is:

$$Q = A\,V$$

in which $Q$ = the discharge of the stream in sec.-ft.
$A$ = the area of the cross-section in sq. feet.
$V$ = the mean velocity of flow, in ft. per sec.

In applying this formula to the determination of stream discharge, the mean velocity of a stream is considered a function of the slope and of the wetted perimeter of the stream. This may be expressed by formula as follows:

$$V = C\sqrt{rs}$$

in which $r$ = the hydraulic radius of the channel.
$s$ = the surface slope.
and $C$ is a variable coefficient, depending upon the nature of the channel.

In determining the value of $C$ for any given case it is customary to make use of Kutter's formula, which is:

$$C = \frac{41.6 + \dfrac{.00281}{s} + \dfrac{1.811}{n}}{1 + \left\{41.6 + \dfrac{.00281}{s}\right\}\dfrac{n}{\sqrt{r}}}$$

In this formula $r$ and $s$ have the same significance as in the Chezy formula and the new factor $n$ is called the coefficient of roughness. It is a variable coefficient, and its value is dependent upon the size, shape, slope and degree of roughness of the channel. Tables of values of $n$ are given in various text books, but it is difficult to choose the correct value. It is therefore advisable, whenever possible, to compute the value of $n$ from a measured discharge. As the slope method of determining discharge is seldom employed except to estimate flood discharge, a current meter measurement is very often made at the slope section, during low water. Having determined the mean velocity, slope and hydraulic radius at the time of the metering, the value of $C$ may be found from the formula $V = C\sqrt{rs}$ or $C = \dfrac{V}{\sqrt{rs}}$ Trautwine's Pocket Book for Civil Engineers and other texts contain tables giving the value of $n$ for different values of $r$, $s$, and $c$. From these tables we can interpolate the proper value of $n$ for a particular section of the stream, at low water stage. In most cases this value of $n$ is applicable to high water and flood conditions of the stream also, and is used with values of $r$ and $s$ for the high water or flood cross-section to determine the value of $C$ at the higher stage. Having determined the value of $C$ the computation of the discharge is simple.

The results obtained by the slope method are in general only roughly approximate, owing to the difficulty in obtaining accurate data and the uncertainty of the value of $n$ to be used.

Weir Method of Determining Discharge.—As yet few permanent weirs have been constructed by this survey, but many regular weir measurements are made on small streams by means of a temporary weir. The weir used consists of a wooden base of 2-inch plank, to which is bolted a rectangular notch of three-eighths inch steel with bevelled edges.

In making a measurement by means of a temporary weir, the following directions should be followed as far as possible. The weir should be placed perpendicular and at right angles to

the bed of the stream with the crest level. The discharge should be free in so much as the nappe should have sufficient fall to allow air to have free circulation underneath it, and the head or depth on the crest should not exceed one-third of the length. The channel of approach should be several times as wide as the opening and the depth of water in the bay or pond should be at least twice the head on the weir, so as to eliminate velocity of approach and cross-currents. In choosing a site for a weir, a point should be chosen that will fulfil the above conditions and give a good-sized bay or pond.

To set up a temporary weir, a dam of sods and earth is thrown across the stream, the weir is set in place and the sods are tramped firmly around it to stop all leakage. On a stream with a sandy bed, sods or clay must be placed on the bottom for a few feet upstream to form a mattress to prevent the undermining of the dam.

After the bay has filled up, the head of the water is observed by taking the difference in elevation of the crest of the weir and the elevation of the water surface in the bay at a distance of 4 to 10 feet from the weir, with an engineer's level. Two common methods of getting the elevation of the water surface are: (1) hold the levelling rod on a stone or other solid body under water and subtract the depth of water on the rod from the sight on the rod; (2) drive a pin divided into tenths of feet into the bed of the stream so that an even tenth is level with the surface of the water, then hold the levelling rod on the top of the pin and add the length of pin above the water to the sight on the rod.

When the head of water has been determined, the discharge is computed by using one of the standard formulae which will suit the case. Tables giving the discharges for different heads and lengths of crests are published in many engineering texts.

The formula used by this survey for rectangular sharp-crested weirs is:

$Q=3.33 \quad (L-.2H) \; H^{3}/_{2}$ being a modification of Francis' formula, to allow for end contractions and elimination of velocity of approach.

in which $Q$ = discharge in sec.-ft.; $L$ = length of crest in feet; $H$ = head in feet.

Measurements by means of temporary weirs should be made some distance above or below the gauge. If they are made close to a gauge, the gauge must be read before the weir is placed in the stream, and the pond must be allowed to run off after the weir is removed before the gauge is re-read.

Where permanent weirs are installed, the gauge height observed is that of an auxiliary gauge above the weir, which is kept so that the head of the weir can be read direct. The weir is not usually placed so that it will interfere with the regular station, so that if at any time the weir is destroyed the regular gauge can be read during the period that the weir is out of order.

Velocity Method of Determining Discharge.—There are two methods of determining the velocity of flow of a stream, namely, direct and indirect. In the direct method, by which the velocity is determined by means of floats, the liability of error is large, and the results far from satisfactory. This method is seldom used except for very rough estimates, or when a current meter cannot be used. There are three common kinds of floats, viz.: surface, sub-surface and tube or rod floats. In each the procedure is the same. A straight piece of channel is selected for the run and two cross-sections are taken at some convenient distance apart, usually from 100 to 200 feet. They are then divided into strips by means of a tagged wire. The velocity in each strip is then measured by noting the time taken by the float in traversing the run or distance between the two cross-sections. As the time and distance are both known the velocity can easily be computed. The velocity, whether measured by surface, sub-surface or tube floats, must be multiplied by a coefficient less than unity to reduce to the mean velocity before being used to compute the discharge.

The indirect or current-meter method is the most reliable and most widely used method of determining the velocity of the flow of a stream. The meter used by this survey is the Price Patent, manufactured by W. & L. E. Gurley, Troy, N.Y. It consists of six cups attached to a vertical shaft, which revolves on a conical hardened steel point when immersed in moving water. The number of revolutions is indicated electrically. The rating or relation between the velocity of the moving water and the revolutions of the wheel is determined for each meter by drawing it through still water for a given distance at different speeds and noting the number of revolutions for each run. From this data a rating table is prepared which gives the velocity per second of moving water for any number of revolutions in a given time interval.

In making a measurement with a current meter, a number of points, called measuring points, are measured off above and in the plane of the measuring section, at which observations of depth and velocity are taken. These points are spaced equally for those parts of the section where the flow is uniform and smooth, but should be spaced unequally for other parts according to the discretion and judgment of the engineer. In general, the points should not be spaced farther apart than 5 per cent of the distance between piers, nor farther apart than the approximate mean depth of the section at the time of measurement.

The measuring points divide the total cross-section into elementary strips, at each end of which observations of depth and velocity are made. The discharge of any elementary strip is the product of the average of the depths at the ends, the width of the strip, and the average of the mean velocities at two ends of the strip. The sum of the discharges of the elementary strips is the total discharge of the stream.

The accuracy of a discharge measurement taken at a velocity area station is dependent on two factors, the accuracy with which the area of the cross-section and the mean velocity of

the flow normal to that section are measured. The greatest, and the most common errors in measurements of discharge are caused by erroneous soundings. Errors in soundings by weight and line are due to the weight being carried down-stream, or, sometimes to the bowing of the line. Both these causes make the soundings too great. Errors in soundings with rods are due to the rod not being perpendicular, to the water rising on the rod, and to the rod sinking in the bed. In order to verify the accuracy of soundings made at medium or high stages they should be compared with those at low water. The mean velocity is also very difficult to measure accurately, because it is constantly changing. It varies not only from the surface to the bottom, but from one bank of the stream to the other, making it necessary to measure it at a number of points.

### METHODS OF DETERMINING MEAN VELOCITY.

There are a number of different methods of determining the mean velocity at the ends of these strips, or, as it is commonly called, the mean velocity in a vertical, namely, multiple-point, single-point, and integration. These three principal multiple-point methods in general use are the vertical velocity-curve, three-point and two-point method.

Vertical Velocity-Curve Method of Determining Mean Velocity.—In this method the centre of the meter is held as close to the surface of the water as possible, being careful to keep it out of reach of all surface disturbances, and then at a number of different depths throughout the vertical. The velocity at each position of the meter is recorded. These observations are then plotted with velocities in feet per second as abscissae and their corresponding depths in feet as ordinates, and a mean curve is drawn through the points. The mean velocity for the vertical is obtained by dividing the area bounded by the curve and its axis by the depth. In the absence of a planimeter for measuring the area, the depth is divided into 5 to 10 equal parts, and the velocities of the centre ordinates of these parts are noted. The mean of these velocities will very closely approximate the mean in the vertical.

It is often more convenient, when the depth is a number of feet and a fraction, as 7.4, to divide the depth into 7 parts of a foot width, and a part of 0.4 foot width. Then the velocity to enter for the narrow part is 0.4 of the velocity at the centre of it.

The vertical velocity curve is useful in studying the manner in which velocities occur in a vertical. From a study of a number of these curves the other shorter methods of determining mean velocity are deduced. On account of the length of time taken to complete a measurement, this method is not used in general routine measurements, except during the winter, for a change of stage is almost sure to occur during a measurement on a large stream which counterbalances the increased accuracy. For this reason its use is limited to the determination of the coefficient to be used in the reduction of values obtained by other methods of measuring velocity to the true value, to the measurements of velocities under new and unusual conditions of flow, and for measurements under ice.

Three-Point Method of Determining Mean Velocity.—This method is one of the short methods of obtaining the mean velocity in the vertical and, under some conditions, gives the most accurate results next to the vertical velocity-curve method. It has been used almost exclusively by this survey in past years, during the open water period, but recently has been superseded by the two-point method which, under most conditions, gives more accurate results. In the three-point method, the current-meter is held at 0.2, 0.6, and 0.8 depth. The mean is then obtained by dividing by 4 the sum of the velocities at 0.2 and 0.8 depth plus twice the velocity at 0.6 depth.

Two-Point Method of Determining Mean Velocity.—In studying the vertical curves made at a number of different points and under varied conditions, it has been found that the mean of the velocities occurring at 0.2 and 0.8 depth gives very nearly the mean velocity in the vertical. Use is made of this fact in the two-point method of determining mean velocity, the meter being held at 0.2 and 0.8 depth in the vertical. This method has been found more accurate than the single-point method and the time required for a metering is not very much greater. This method has been found to give, also, a very close approximate to the mean velocity in measurements of ice-covered streams, although these flow under very different conditions from those of open water.

Single-Point Method of Determining Mean Velocity.—Experiments made under most favourable conditions and extending over a long period have established the point of mean velocity in a vertical at 0.6 of the depth. Therefore the error resulting from the use of the 0.6 depth as the depth of mean velocity is very small, though in some few cases a study of the vertical velocity curve will show the need of a coefficient to reduce the observed velocities to the mean. The variation of the coefficient from unity in individual cases is, however, greater than in the two or three-point method, and the general results are not as satisfactory. For that reason this method is not employed very extensively by the survey.

In the other principal single-point method the meter is held near the surface, at from 0.5 to 1 foot below the surface, care being taken to sink the instrument below the influence of wind or waves. The resulting velocities must be multiplied by a coefficient to reduce them to mean velocities. This coefficient as found by a large number of experiments, varies from 0.78 to 0.98, depending upon the depth and speed of the stream. The deeper the stream and the

greater the velocity, the larger the coefficient. In flood work coefficients varying from 0.90 to 0.95 should be used. This method is only used when the current is too strong to permit the sinking of the meter to any great depth below the surface of the water. It is often employed at time of flood, or when a stream is carrying a lot of drift-wood or ice.

Integration Method of Determining Mean Velocity.—This method of determining the mean velocity in a vertical consists in moving the meter at a slow uniform speed from the bed of the stream to the surface and return in a vertical direction, the time and revolutions being observed. In travelling through all parts of the vertical the meter is acted upon by each and every thread of velocity from the bed to the surface of the stream, and the resulting observations determine the mean in that vertical.

This method is very useful in checking the results of other methods. It is, however, seldom used by this survey, as the Price meter is not suited to observations by this method, since the vertical motion of the meter causes the wheel to revolve.

## GAUGING STATIONS.

The first step is to select a suitable locality for a gauging station. Although apparently simple, this is really a difficult task. Not only must the water be moving in nearly straight lines over a solid bed and between well defined banks, but the place must be accessible at moderate cost and there must be living near it a competent person who can be engaged to serve as observer. Permanent gauging stations should only be selected after a very thorough reconnaissance. In the irrigation districts and in more thickly populated districts there is more or less diversion of water. This is apt to complicate matters for the engineer, for a gauging station above all works may not include all the tributaries of the stream and it is often necessary to establish gauging stations at several points along the streams, and on tributaries, canals, and pipe lines in order to obtain complete information regarding the water supply in a particular stream.

There are three classes of gauging stations, namely, wading, bridge and cable stations. The wading station can of course only be used in the case of small streams having a maximum depth at its highest stage of three feet or less. The equipment for a wading station is small, consisting usually of a plain staff gauge, graduated to feet and hundredths, and fixed vertically to one of the banks of the stream. For convenience a measuring line, usually a wire with tags, may be fixed permanently at this section. When taking the reading, the engineer should stand below and to one side of the meter so as not to cause eddies in the water.

Bridge stations, because of their permanency and the freedom of movement allowed the engineer, are much preferred. Very often, however, more particularly in swift currents, the piers materially affect the accuracy of the results. When the gauge cannot be attached to a pier it is often attached horizontally to the guard-rail or floor of the bridge, and the height of the stream is found by lowering a weight by a chain over a pulley. It is indicated by a marker on the chain. Distances of three, five or ten feet, according to the size of the stream, are marked on the lower chord of the down stream side of the bridge, to serve as a measuring line.

Frequently it is impossible to establish a permanent gauging station at a bridge. In that case the wire cable of a ferry can be utilized, or, if that is not available, a permanent wire cable is stretched across the river. For spans of average length a galvanized wire cable three-fourths of an inch in diameter is safe. It is supported at each bank by means of high struts or by passing it through the crotch of a tree. The cable is run into the ground and anchored securely to a "dead man" buried at least six feet below the surface, or, if convenient, it is anchored to a lower part of the trunk of a tree. A turnbuckle is inserted in the cable between the strut and anchorage to permit tightening the cable when it begins to sag. A permanent measuring line, usually a wire, with tags five or ten feet apart, is stretched across the stream just above the cable. A cage large enough to carry two men and instruments is constructed and suspended from the cable by means of cast iron pulleys. The cage is moved from point to point by hand. A stay line, usually quarter inch guy wire, is stretched across the stream about thirty to forty feet upstream from the cable, and securely fastened. By passing a sash cord through a pulley hung on this stay line the current-meter is prevented from being carried down stream. This type of station has the advantage that it can usually be located at the most desirable point on the stream and is free of piers and other obstructions.

## LOW VELOCITY LIMITATIONS.

Owing to the presence of a slight amount of friction in the current-meter, a certain definite velocity is required to make the wheel revolve, *i.e.*, to overcome the frictional resistence of the wheel. For this reason the meter is unsuitable for the measurement of low velocities approaching this value. This velocity, which is required to overcome friction, and which is obtained from the meter rating curve, is called the velocity of no flow for the particular meter referred to. It varies in different types of meters, and also slightly in meters of the same type, according to the time the meter is in use, but very seldom exceeds 0.2 foot per second in any meter. From a number of observations the low velocity limit, below which values of velocity are unreliable, is found to be 0.5 foot per second. In many cases at low stages the gauging station on a stream becomes unsuitable for a discharge measurement owing

to the mean velocity in the section falling below the safe limit. In such instances, where it is possible to wade the stream, a suitable gauging section may be located within a reasonable distance of the regular station and the discharge measurements made at this point. When a gauging is made at a cross-section other than the regular station, sufficient soundings should be made at the latter at the time of the gauging to develop the cross-section and compute the area. The measurement is thus referred to the regular gauging station, and the mean velocity and area at the regular section are reported and used in the office computations.

## OFFICE COMPUTATIONS.

Rating Curves and Tables.—When a series of discharge measurements has been made at a gauging station a rating curve is constructed for that station, showing graphically the discharge corresponding to any stage of the stream within the limits covered by the gaugings. This curve, as it is usually drawn, has as abscissae the discharges in second-feet, and as ordinates the corresponding gauge heights at which the discharges were made. A smooth curve is drawn through the resulting set of points, and from this curve the discharges at any stage within the limits of the curve are taken. Some measurements may be more reliable than others, owing to more or less favourable conditions at different times of gauging, or to other causes. In order to obtain the weight of the different measurements, curves with area and mean velocity, as abscissae, and gauge heights as ordinates, are also drawn. From a study of these curves any discrepancies in a measurement, either in its area or mean velocity, may be detected. Should it be necessary to extend the rating curve beyond the limits of actual discharge measurements, the area and mean velocity curves may be constructed to the stages for which the discharge curve is desired, and the latter found by taking the product of the two curves. The discharge curve under natural conditions of flow is always convex to the gauge height axis. The area curve is either a straight line or is convex to the gauge height axis, except in the case of overhanging banks, when it becomes concave to the axis. The mean velocity curve is always concave to the gauge height axis, except in cases where standing water occurs below the stage of no-flow. In this case the curve will assume a reverse form, starting from the gauge height of zero-flow with a curve convex to the gauge height axis and gradually reversing to a curve concave to this axis. In plotting all three curves the horizontal and vertical scales should be chosen that the curves may be used within the limits of accuracy for the work, and in their critical position will make, as nearly as possible, angles of 45 degrees with each axis.

The rating curve being constructed, it becomes necessary to prepare a station rating table, giving the discharge at any stage of the stream within the limits of the daily gauge height observations on record. From this rating table the daily discharges corresponding to the daily gauge heights are read and tabulated. The rating table is constructed for tenths, half-tenths, or hundredths of feet, according to the readings of the gauge to which it is to be applied. The discharges for this table are read directly from the rating curve and are then adjusted so that the differences for successive stages shall be either constant or gradually increasing, but never decreasing, unless the station is affected by backwater.

Daily Discharge, Monthly Mean, and Run-Off.—The rating table being made to cover the range of daily gauge height observations, the next procedure in the computations is to make out a table of daily discharges from this rating table. The daily gauge heights are copied as they were sent in by the observer, and opposite each the corresponding discharge is filled in from the rating table. The monthly discharge is found by totalling the daily discharges for the month in question, and the monthly mean is obtained by dividing this total by the number of days in the month.

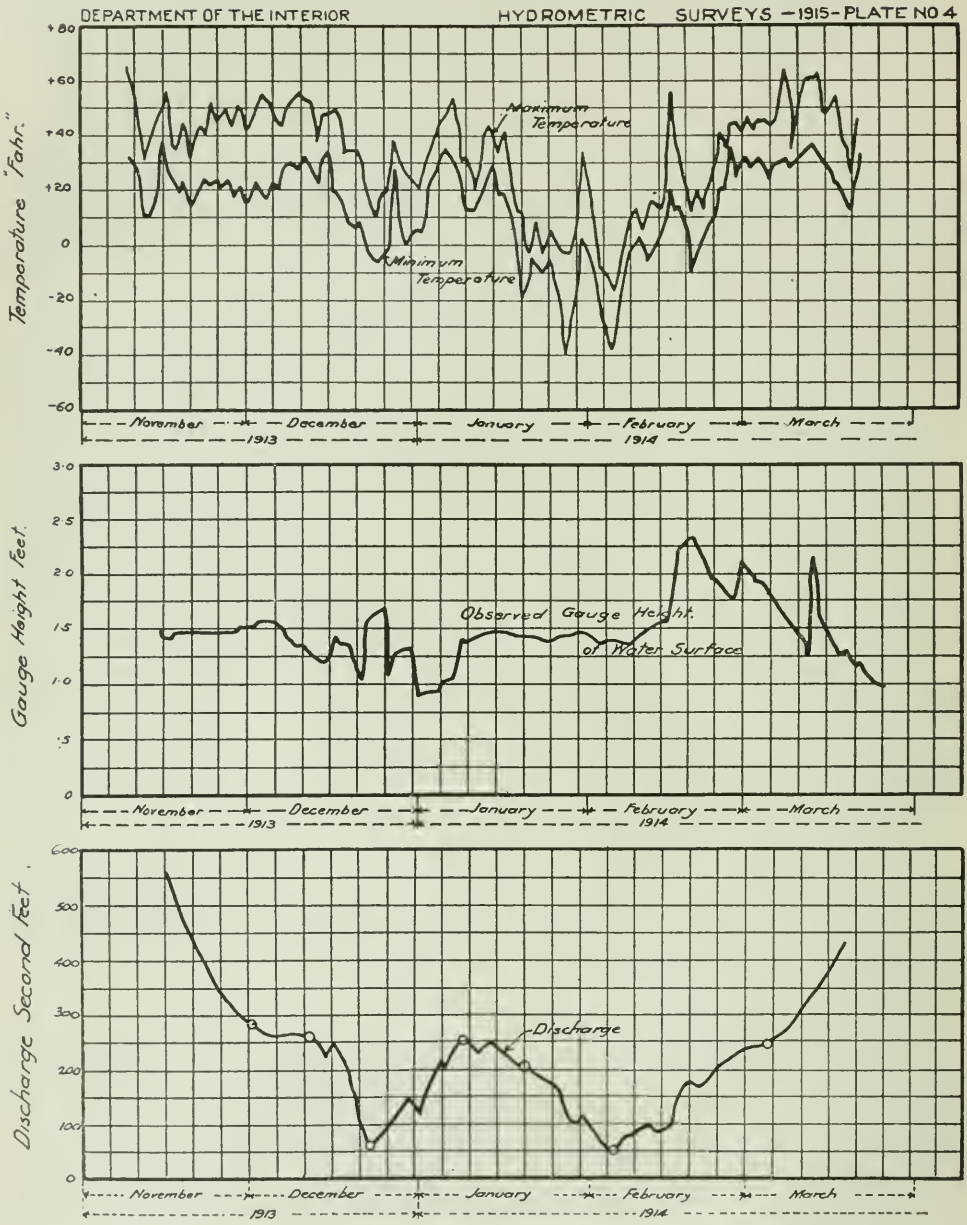
The run-off is computed with two different sets of units, depending upon the kind of work for which the data is intended, as follows:

(1) Run-off in inches is the depth to which a plane surface equal in extent to the drainage area would be covered if all the water flowing from it in a given time were conserved and uniformly distributed thereon; it is used for comparing run-off with rainfall, which is usually expressed in depth in inches. The monthly mean run-off in second-feet is divided by the area of the drainage basin in square miles to find the monthly mean run-off per square mile. This result, reduced to run-off in depth in inches for the monthly period, is in the form required.

(2) The run-off in acre-feet is the form of most use in connection with storage. An acre-foot is equivalent to 43,560 cubic feet, and is the quantity of water required to cover an acre to the depth of one foot. The monthly mean run-off in second-feet is used for the computation of run-off in acre-feet. The monthly mean is reduced to cubic feet per month, and this quantity divided by 43,560 gives the run-off in acre-feet.

The run-off of the stream being computed both in depth in inches and in acre-feet for each month, the run-off for the period during which observations of run-off were made is found by the summation of the amounts of run-off for the several months making up this period.

Changing Conditions of Channel.—On streams such as Milk River, whose bed is in a constant state of motion, measurements of discharge should be made every few days, otherwise considerable data relating to changes cannot be obtained. For discharges on days other than those on which measurements are taken, the interpolation method is used. The two methods of interpolation in general use are the Stout and Bolster methods.




OBSERVATIONS OF GAUGE HEIGHTS ON ST MARY RIVER AT WHITNEY'S RANCH WITH CORRESPONDING MAXIMUM AND MINIMUM TEMPERATURES AND THE ESTIMATED DAILY DISCHARGES FOR THE WINTER 1913-1914

*The circles on the discharge graph indicate actual discharge measurements*

The Stout method deals with the correction of the gauge heights. A curve is drawn, using the difference between the actual gauge heights at the time of measurement and the gauge height corresponding to the measured discharge as ordinates, and the corresponding days of the month as abscissae. From an irregular curve drawn through these points corrections for gauge heights can be made for days on which there was no discharge measurement. When the discharge is greater than that given by the curve the correction is positive, and vice-versa. Each daily gauge height is corrected by the amount shown on the correction curve, and the corresponding discharge taken from an approximate rating curve for the station.

The Bolster method deals more particularly with the modification of the discharge. Results of discharge measurements covering a whole year or season are plotted and, though considerably scattered, will define one or more regular curves, called standard curves, the number and position of each indicating the radical changes. Where the river bed changes from day to day, the position of the standard curve also varies and must pass through the points indicating the different days. The points indicating two successive measurements are joined by a line, which for short distances on the cross-section paper is a straight line, and otherwise a curve. This line is divided into a number of equal parts, each indicating an intervening day, the assumption being that as the change during this period is gradual the daily rating must pass through each point or day, as represented by the divisions. A simple and convenient way of making these interpolations and moving the daily rating curve is to make a tracing of the standard curve with a vertical line of reference. By keeping the lines of reference coincident, this curve can be shifted into any desired position and the discharge read for any gauge height.

## WINTER RECORDS.

Formation of Ice and Ice Conditions.—Perhaps the greatest difficulties in stream measurements are met with in the early part of the winter, just as the streams are commencing to freeze up. Especially is this true in the swift running streams in or near the mountains. Needle and anchor ice often form in large quantities in rapids and, flowing in masses with the water, make gaugings very difficult and unreliable. Even after a permanent ice cover is obtained at the gauging station this ice will, in some cases, obstruct the channel below the station and cause "backwater."

A further difficulty is that the surface ice usually forms along the edges of the stream for some time before forming in the centre of the channel. At first this may be broken away if the stream is small and open water measurement made, but later it is necessary to take some observations through holes in the ice along the edge. As the streams get farther away from the mountains their velocity decreases, and fewer rapids occur along their course. There is then less trouble with needle and anchor ice, and a permanent ice cover forms much more quickly.

In many cases the section used during the summer is very unsuitable for making measurements during the winter. It may be (a) too wide and shallow or flowing in two channels during the winter, due to low water; (b) partially open, due to swift running water or warm water running in; (c) affected by needle and anchor ice, either by flowing in the water, or causing backwater; (d) located where the snow drifts over the ice to a great depth; (e) that it is likely to have a rough ice cover or pile up with ice, due to swift water and a rough bed; (f) that there is a tendency for ice jams to occur, with consequent backwater, etc.

It is therefore often necessary to choose a new section for winter observations. This should be done before freeze-up, for then the width, depth, uniformity of flow and conditions above and below can be easily noted. The most suitable stations for winter measurements are those which have a long stretch of very smooth, sluggish water above, and a rapid fall below.

Discharge Measurements.—In winter as in summer, the daily discharges of a stream are computed from frequent discharge measurements, and daily gauge height observations. The discharge measurements are made through holes in the ice from five to ten or even twenty feet apart, depending upon the size of the stream, and large enough to allow the current-meter to pass through freely. The gaugings are made in the same manner as at open sections except that the depth of the stream is taken as the distance from the bottom of the ice to the bed of the stream. The soundings, however, are always referred to the surface of the water in the holes, the distance from the surface of the water to the bottom of the ice being measured and subtracted from the soundings to obtain the depth.

The vertical velocity curve method is usually used for the determination of the mean velocity in the vertical. A curve is plotted for each vertical, and the mean velocity is determined in the usual manner. These curves vary greatly as to form for different kinds and conditions of channel.

The typical curve, however, differs from that obtained from an open water observation in that it is drawn back more at the surface, owing no doubt to greater friction between the ice and the water as compared with the water and the atmosphere. As a result there are two points in the vertical at which the thread of mean velocity occurs under an ice cover. These points are near 0.2 and 0.8 of the total depth below the bottom of the ice, and the mean of the

velocities at these two depths will give accurate results, but when close estimates of the discharges are required, and the conditions are not very favourable, the vertical velocity method should be used.

It is found that when all the holes are opened on a small swift stream, there are sometimes vertical pulsations of the water in the holes, which affect the velocity readings. This can usually be avoided by only opening one hole at a time, and filling it in again with ice and snow as soon as the observation is finished. It can also be overcome by inserting a thin sheet of galvanized tin or iron at the bottom of the hole after the meter has been lowered into the water. The meter should always be held near the upstream side of the hole.

In using the meter care must be taken to keep it under the water as much as possible to prevent ice from forming around the bearings. It is a good plan to clean and oil the meter indoors before starting out to make a gauging.

Gauges and Gauge Observations.—The gauge is usually read once each day, the observer noting the elevation of the water as it rises in a hole cut through the ice, the height of the top of the ice, the thickness of the ice, presence of needle or slush ice, snow on top of ice, ice jams, and any sudden changes in temperature. To do this the observers are provided with an ice chisel for chopping holes, and an L-shaped ice scale to measure the thickness of the ice.

A difficulty which arises in obtaining the thickness of the ice is that in a hole kept open for some time the ice wears away around the bottom of the hole, and may make it necessary to cut a new hole near by, or to enlarge the original.

Any form of gauge may be used, but the chain gauge is the most satisfactory, as the staff gauge, being frozen to the ice, heaves with it, and also in cutting away the ice from around it the figures are effaced. The automatic gauge gives trouble with the well freezing over.

Estimates of Daily Discharge.—While the run-off, particularly during the winter months, does not vary directly in accordance with the precipitation, the rate at which it reaches the streams is, of course, dependent almost entirely upon the climatic conditions. The climate in the mountains is subject to great extremes, but during the winter almost the entire precipitation is in the form of snow.

There is, therefore, very little surface run-off, and the flow of the streams comes almost entirely from the glaciers, ground waters and lake storage, and except for the losses due to freezing and the slight increases, due to the melting of snow and ice by chinooks (warm winds), the flow in the streams would remain constant or would change gradually.

There are, however, certain local conditions in Western Canada which make it exceptionally difficult to make estimates of the daily discharge during the winter. The gauge height in many cases fluctuates very much, and often sudden rises or drops occur. These rises are often explained by the fact that during very cold spells a great deal of slush, frazil, and anchor ice is formed and chokes up the channel, thus raising the surface of the water, when in reality the discharge is decreasing. Then, again, a chinook causes a sudden rise in temperature and the discharge is often increased, while at the same time the gauge height gradually lowers, evidently because the warmer weather and water have melted out a lot of the ice from the channel and given it a greater carrying capacity.

In order to make reliable estimates of the daily discharge, gaugings must be made at short intervals and the weather conditions and temperatures in the whole of the drainage area above the stations must be very carefully studied.

W. G. Hoyt, District Engineer, Water Resources Branch, U.S. Geological Survey, has made an exhaustive study of methods for estimating the flow when streams are frozen. The various methods described by him in an article in "Engineering News" on April 10, 1913, and Water-Supply Paper 337, published by the United States Geological Survey, in 1913, and modifications of them, are used. The graphic method of interpolation has been found to be generally applicable, but as the precipitation during the winter months has so little effect upon the run-off during that period, it is seldom plotted on the sheets. It is also considered that the extremes and ranges of temperatures are better guides for interpolation than the mean temperatures, and the minimum and maximum temperatures are both plotted and given due consideration rather than the mean temperatures.

The weather conditions and temperatures at the gauging station are not always typical for the whole drainage basin above, and care must therefore be taken to have the meteorological observations made at some other place, or, if necessary, at two or more places. Of course, care must be taken to study all the possible conditions which may affect the estimates.

Plate 4 shows typical conditions and illustrates the graphic method of interpolating the daily discharges.

Additional information on this subject may be found in the appendix of the 1914 report.

## RATING CURRENT-METERS.

Each meter is rated before being used, in order to determine the relation between the revolutions of the wheel and the velocity of the water. The meter is driven at a uniform rate of speed through still water for a given distance, and the number of revolutions of the wheel and the time are recorded. From this data the number of revolutions per second and the corresponding velocity per second are computed. Tests are made for speeds varying from the slowest which will cause the wheel to revolve to several feet per second. The results of these

runs, when plotted with revolutions per second as abscissae, and velocity in feet per second as ordinates, locate points that define the meter rating-curve, which for all meters is practically a straight line. From this curve a meter rating table is prepared. Theoretically, the rating for all meters of the same make and type should be the same, but as the result of slight variations in construction and in the bearing of the wheel on the axis at different velocities, the ratings differ.

After a meter has been in use for some time the cups may have received small injuries, or the bearing of the wheel on the axis may have changed owing to unavoidable rough usage. These changes will affect the running of the meter and change its rating. As a consequence, each meter is re-rated at regular intervals and a new rating curve and table prepared.

Descriptions of the rating station, discussions of the methods employed, and the results of ratings, are given in the Reports of Progress of Stream Measurements for the years 1911 and 1912.

## PEACE RIVER DRAINAGE BASIN.

*General Description.*

Peace River is the largest and longest tributary of the McKenzie River. It is formed by the confluence of the Finlay and Parsnip Rivers, both of which rise in and drain a large district lying along the eastern slope of the Rocky Mountains in Northern British Columbia.

From its head the Peace flows in a general easterly direction, through a large plateau, some 300 miles to the mouth of the Smoky River, its largest and most important tributary. Between these two points there are a few small streams entering the Peace, the most notable being the Pine River, which rises in the hills in British Columbia near the Alberta line.

From the mouth of the Smoky, the river flows north for about 250 miles, nearly to Fort Vermilion, then pursues a northeasterly course for about 200 miles where it is joined by the overflow from Lake Athabaska, forming the Great Slave River. The territory drained by this portion of the Peace is bounded on the north by the Laird River and on the south and east by the Fraser and Athabaska Rivers.

Of several streams discharging their waters into the Peace between the mouth of the Smoky and Lake Athabaska there are only two that drain a very large area. These are the Wakiskaw and Red Rivers, both of which rise on the height of land west of the Athabaska and drain a large low country lying between the Peace and Athabâska Rivers, and north of the Lesser Slave Lake.

Aside from these two rivers and the Smoky, which receives a small portion of its supply from a thinly wooded and prairie country, the Peace has no important tributaries which cannot be considered as mountain streams. Therefore the stage of the water is governed to a large extent by storage of winter precipitation in the mountains, and floods in the early spring are not usual. However, in July and August, high temperatures and warm rains in the mountains cause the snow-covered portion of the drainage basin to discharge large quantities of water and it is at this time that the greatest floods occur.

In 1915 there were no excessive floods on the Peace River, the maximum stage was reached on the 14th of July and was caused by warm rains in the mountains, the effect of which was more noticeable on the Smoky than on the Peace River (re floods, see also Appendix No. 4).

As yet very little hydrometric work has been done in this district, largely due to the unsettled conditions of the country and the slow methods of transportation. However, the Edmonton, Dunvegan and British Columbia railroad, now under construction, will cut the northern end of the drainage basin, and as the country comprising this portion of the district is being rapidly settled, it is probable that more extensive work will be carried on in the near future.

In 1915, two regular gauging stations were established on the Peace, one on the Smoky, and one on the North Heart River. Miscellaneous discharge measurements were made on the Little Smoky River and on all the larger tributaries between Peace River Crossing and Fort Vermilion.

### SMOKY RIVER AT PRUDENT'S CROSSING.

*Location.*—On the SW. ¼ Sec. 10, Tp. 78, Rge. 24, W. 5th Mer., at the ferry crossing between Prudent's Crossing and J. D. McArthur's cache No. 19.

*Records available.*—June 2, 1915, to December 31, 1915.

*Gauge.*—Vertical staff on left bank of river about 200 feet upstream from ferry tower. Elevation of zero maintained at 80.59 feet since establishment.

*Bench-mark.*—Spike driven in poplar stump, on left bank of river about 150 feet upstream from gauge. Assumed elevation 106.14 feet.

*Channel.*—One channel at all stages, shifting.

*Discharge Measurements.*—Made from ferry boat.

*Winter Flow.*—River affected by ice from November to April.

*Observer.*—P. McCallum, June 2 to November 28, 1915. A. Rainville, November 28 to December 31, 1915.

DISCHARGE MEASUREMENTS of Smoky River at Prudent's Crossing, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| June 4 | P. H. Daniells | 753 | 6,044 | 3.75 | 11.42 | 22,668 |
| June 26 | do | 800 | 7,342 | 4.06 | 12.92 | 29,808 |
| June 28 | do | 887 | 10,384 | 5.33 | 16.52 | 55,347 |
| Aug. 27 | do | 652 | 4,718 | 2.88 | 10.43 | 13,641 |
| Oct. 21 | do | 971 | 2,845 | 3.18 | 9.23 | 9,067 |
| Dec. 16 | I. R. Strome | 635 | 3,226 | 0.51 | 8.61 | 1,639 |

DAILY GAUGE HEIGHT AND DISCHARGE of Smoky River at Prudent's Crossing, for 1915.

| Day. | June. | | July. | | August. | | September. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 12.72 | 28,382 | 12.22 | 24,832 | 9.92 | 11,480 |
| 2 | 10.52 | 14,100 | 12.62 | 27,672 | 12.22 | 24,832 | 10.02 | 11,880 |
| 3 | 10.72 | 15,100 | 12.52 | 26,962 | 12.02 | 23,412 | 9.52 | 10,060 |
| 4 | 11.42 | 19,142 | 12.02 | 23,412 | 11.72 | 21,272 | 9.22 | 9,160 |
| 5 | 12.92 | 29,802 | 11.42 | 19,112 | 11.62 | 20,562 | 9.12 | 8,860 |
| 6 | 12.62 | 27,672 | 11.02 | 16,720 | 11.52 | 19,852 | 9.22 | 9,160 |
| 7 | 12.42 | 26,252 | 11.12 | 17,320 | 11.02 | 16,720 | 9.22 | 9,160 |
| 8 | 12.22 | 24,832 | 10.82 | 15,600 | 10.82 | 15,600 | 9.02 | 8,560 |
| 9 | 12.52 | 26,962 | 10.82 | 15,600 | 11.02 | 16,720 | 8.72 | 7,660 |
| 10 | 12.32 | 25,542 | 11.22 | 17,920 | 11.02 | 16,720 | 8.52 | 7,100 |
| 11 | 13.92 | 36,902 | 15.02 | 44,712 | 10.92 | 16,120 | 8.52 | 7,100 |
| 12 | 12.62 | 27,672 | 18.12 | 66,722 | 11.02 | 16,720 | 8.62 | 7,360 |
| 13 | 13.52 | 34,062 | 20.42 | 83,052 | 10.92 | 16,120 | 8.52 | 7,100 |
| 14 | 13.62 | 34,772 | 21.92 | 93,702 | 10.72 | 15,100 | 8.12 | 6,850 |
| 15 | 13.42 | 33,352 | 21.82 | 92,992 | 10.42 | 13,600 | 8.42 | 6,850 |
| 16 | 13.22 | 31,932 | 21.72 | 92,282 | 10.22 | 12,680 | 8.42 | 6,850 |
| 17 | 13.62 | 34,772 | 21.32 | 89,442 | 10.12 | 12,280 | 8.62 | 7,360 |
| 18 | 14.52 | 41,162 | 20.72 | 85,182 | 10.22 | 12,680 | 9.02 | 8,560 |
| 19 | 14.62 | 41,872 | 20.12 | 80,922 | 10.42 | 13,600 | 9.32 | 9,460 |
| 20 | 14.42 | 40,452 | 19.52 | 76,662 | 10.52 | 14,100 | 9.32 | 9,460 |
| 21 | 14.12 | 38,322 | 18.62 | 70,272 | 12.02 | 23,412 | 9.62 | 10,370 |
| 22 | 13.62 | 34,772 | 17.72 | 63,882 | 11.42 | 19,142 | 9.52 | 10,060 |
| 23 | 13.12 | 21,222 | 16.82 | 57,492 | 11.22 | 17,920 | 9.22 | 9,160 |
| 24 | 12.72 | 28,382 | 15.92 | 51,102 | 10.82 | 15,600 | 9.02 | 8,560 |
| 25 | 12.62 | 27,672 | 15.02 | 44,712 | 10.32 | 13,100 | 8.92 | 8,260 |
| 26 | 12.92 | 29,802 | 14.32 | 39,742 | 10.42 | 13,600 | 8.92 | 8,260 |
| 27 | 12.62 | 27,672 | 13.62 | 34,772 | 10.42 | 13,600 | 8.82 | 7,960 |
| 28 | 16.52 | 55,362 | 13.42 | 33,352 | 10.32 | 13,100 | 8.82 | 7,960 |
| 29 | 14.22 | 39,032 | 12.92 | 29,802 | 10.02 | 11,880 | 8.62 | 7,360 |
| 30 | 13.32 | 32,642 | 12.72 | 28,382 | 9.92 | 11,480 | 8.52 | 7,100 |
| 31 | ..... | ..... | 12.42 | 26,252 | 10.02 | 11,880 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Smoky River at Prudent's Crossing, for 1915. —*Concluded.*

| Day | October. | | November. | | December. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 8.42 | 6,850 | 9.30 | 9,400 | 8.69 | 1,720 |
| 2 | 8.42 | 6,850 | 9.00 | 8,500 | 8.60 | 1,750 |
| 3 | 8.62 | 7,360 | 8.80 | 7,900 | 8.51 | 1,730 |
| 4 | 8.62 | 7,360 | 8.50 | 7,050 | 8.42 | 1,700 |
| 5 | 8.62 | 7,360 | 8.00 | 5,800 | 8.43 | 1,700 |
| 6 | 8.62 | 7,360 | 7.82 | 5,350*a* | 8.44 | 1,700 |
| 7 | 8.52 | 7,100 | 7.36 | 4,320 | 8.45 | 1,700 |
| 8 | 8.52 | 7,100 | 7.60 | 4,800 | 8.46 | 1,660 |
| 9 | 8.52 | 7,100 | 7.34 | 4,250 | 8.48 | 1,640 |
| 10 | 8.42 | 6,850 | 7.18 | 3,980 | 8.50 | 1,650 |
| 11 | 8.32 | 6,600 | 7.00 | 3,600 | 8.52 | 1,660 |
| 12 | 8.32 | 6,600 | 6.06 | 1,750 | 8.56 | 1,670 |
| 13 | 8.32 | 6,600 | 7.00 | 1,750 | 8.60 | 1,650 |
| 14 | 8.32 | 6,600 | 7.34 | 1,750 | 8.54 | 1,640 |
| 15 | 8.32 | 6,600 | 7.68 | 1,740 | 8.56 | 1,640 |
| 16 | 8.32 | 6,600 | 7.92 | 1,750 | 8.50 | 1,640 |
| 17 | 8.32 | 6,600 | 7.76 | 1,780 | 8.50 | 1,650 |
| 18 | 8.22 | 6,350 | 8.30 | 1,800 | 8.50 | 1,660 |
| 19 | 8.72 | 7,660 | 8.44 | 1,800 | 8.50 | 1,670 |
| 20 | 9.52 | 10,060 | 8.48 | 1,800 | 8.60 | 1,680 |
| 21 | 9.32 | 9,460 | 8.49 | 1,790 | 8.80 | 1,690 |
| 22 | 9.02 | 8,560 | 8.50 | 1,800 | 9.00 | 1,690 |
| 23 | 8.90 | 8,200 | 8.51 | 1,800 | 9.00 | 1,690 |
| 24 | 8.90 | 8,200 | 8.52 | 1,800 | 9.00 | 1,680 |
| 25 | 8.80 | 7,900 | 8.63 | 1,790 | 9.00 | 1,670 |
| 26 | 8.50 | 7,050 | 8.64 | 1,780 | 8.90 | 1,630 |
| 27 | 8.50 | 7,050 | 8.65 | 1,750 | 8.80 | 1,600 |
| 28 | 8.50 | 7,050 | 8.66 | 1,720 | 8.80 | 1,510 |
| 29 | 9.15 | 8,950 | 8.67 | 1,700 | 8.70 | 1,410 |
| 30 | 9.40 | 9,700 | 8.68 | 1,700 | 8.60 | 1,340 |
| 31 | 9.40 | 9,700 | ..... | ..... | 8.60 | 1,270 |

*a* Ice conditions.

MONTHLY DISCHARGE of Smoky River at Prudent's Crossing, for 1915.

(Drainage area 18,200 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| June (2-30) | 55,362 | 14,100 | 31,422 | 1.730 | 1.87 | 1,806,985 |
| July | 93,702 | 15,600 | 48,199 | 2.650 | 3.05 | 2,963,639 |
| August | 24,832 | 11,480 | 16,395 | 0.901 | 1.04 | 1,008,090 |
| September | 11,880 | 6,850 | 8,503 | 0.467 | 0.52 | 505,798 |
| October | 10,060 | 6,350 | 7,528 | 0.414 | 0.48 | 462,878 |
| November | 9,400 | 1,700 | 3,283 | 0.180 | 0.20 | 195,352 |
| December (1-31) | 1,750 | 1,270 | 1,635 | 0.090 | 0.10 | 100,532 |
| The period | ..... | ..... | ..... | ..... | 7.26 | 7,043,274 |

NORTH HEART RIVER AT PEACE RIVER CROSSING.

*Location.*—On the NW. ¼ Sec. 29, Tp. 83, Rge. 21, W. 5th Mer., about 200 feet above foot bridge located one-half mile above mouth of river, and 1500 feet above traffic bridge.

*Records Available.*—May 31, 1915, to December 31, 1915.

*Gauge.*—Vertical staff. Elevation of zero maintained at 88.10 feet since establishment.

*Bench-mark.*—Spike driven in 15 inch poplar tree, 30 feet upstream from gauge; assumed elevation 100.00 feet.

*Channel.*—One channel at all stages, fairly permanent.

*Discharge Measurements.*—Made from foot bridge during high water by wading during low water.

*Winter Flow.*—River affected by ice from November to April.

*Observer.*—Ralph Harris.

DISCHARGE MEASUREMENTS of North Heart River at Peace River Crossing, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 31 | P. H. Daniells | 55 | 47.0 | 2.96 | 1.75 | 139.0 |
| June 21 | do | 70 | 67.0 | 3.01 | 2.00 | 202.0 |
| July 12 | do | 90 | 104.0 | 3.41 | 2.50 | 355.0 |
| Aug. 16 | do | 26 | 21.0 | 2.63 | 1.31 | 56.0 |
| Oct. 18 | do | 28 | 25.0 | 2.27 | 1.23 | 56.0 |
| Nov. 1 | do | 35 | 30.0 | 2.67 | 1.44 | 80.0 |
| Nov. 17 | I. R. Strome | 27 | 17.8 | 0.94 | 1.22 | 16.9 |
| Dec. 8 | do | 25 | 10.0 | 0.97 | 1.40 | 9.8 |

DAILY GAUGE HEIGHT AND DISCHARGE of North Heart River at Peace River Crossing, for 1915.

| Day. | May. | | June. | | July. | | August. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.70 | 128 | 1.90 | 175 | 2.20 | 262 |
| 2 | ..... | ..... | 1.70 | 158 | 1.90 | 175 | 2.10 | 230 |
| 3 | ..... | ..... | 1.70 | 128 | 1.80 | 150 | 2.00 | 202 |
| 4 | ..... | ..... | 1.70 | 128 | 1.70 | 128 | 2.00 | 202 |
| 5 | ..... | ..... | 2.10 | 230 | 1.70 | 128 | 2.00 | 202 |
| 6 | ..... | ..... | 2.80 | 450 | 1.60 | 108 | 1.80 | 150 |
| 7 | ..... | ..... | 2.90 | 482 | 1.60 | 108 | 1.80 | 150 |
| 8 | ..... | ..... | 2.90 | 482 | 1.60 | 108 | 1.70 | 128 |
| 9 | ..... | ..... | 3.00 | 514 | 1.60 | 108 | 1.60 | 108 |
| 10 | ..... | ..... | 3.00 | 514 | 1.50 | 90 | 1.60 | 108 |
| 11 | ..... | ..... | 2.90 | 482 | 2.50 | 354 | 1.50 | 90 |
| 12 | ..... | ..... | 2.90 | 482 | 2.80 | 450 | 1.20 | 50 |
| 13 | ..... | ..... | 2.90 | 482 | 3.00 | 514 | 1.20 | 50 |
| 14 | ..... | ..... | 2.90 | 482 | 3.00 | 514 | 1.20 | 50 |
| 15 | ..... | ..... | 2.80 | 450 | 3.00 | 514 | 1.20 | 50 |
| 16 | ..... | ..... | 2.80 | 450 | 2.90 | 482 | 1.30 | 60 |
| 17 | ..... | ..... | 2.80 | 450 | 2.90 | 482 | 1.30 | 60 |
| 18 | ..... | ..... | 2.70 | 418 | 2.90 | 482 | 1.30 | 60 |
| 19 | ..... | ..... | 2.70 | 418 | 2.80 | 450 | 1.30 | 60 |
| 20 | ..... | ..... | 2.60 | 386 | 2.80 | 450 | 1.30 | 60 |
| 21 | ..... | ..... | 2.60 | 386 | 2.80 | 450 | 1.30 | 60 |
| 22 | ..... | ..... | 2.50 | 354 | 2.80 | 450 | 1.20 | 50 |
| 23 | ..... | ..... | 2.50 | 354 | 2.80 | 450 | 1.20 | 50 |
| 24 | ..... | ..... | 2.40 | 323 | 2.80 | 450 | 1.20 | 50 |
| 25 | ..... | ..... | 2.30 | 292 | 2.80 | 450 | 1.20 | 50 |
| 26 | ..... | ..... | 2.30 | 292 | 2.80 | 450 | 1.10 | 40 |
| 27 | ..... | ..... | 2.20 | 262 | 2.80 | 450 | 1.10 | 40 |
| 28 | ..... | ..... | 2.20 | 262 | 2.80 | 450 | 1.10 | 40 |
| 29 | ..... | ..... | 2.10 | 230 | 2.80 | 450 | 1.10 | 40 |
| 30 | ..... | ..... | 2.10 | 230 | 2.80 | 450 | 1.10 | 40 |
| 31 | 1.70 | 128 | ..... | ..... | 2.10 | 230 | 1.10 | 40 |

DAILY GAUGE HEIGHT AND DISCHARGE of North Heart River at Peace River Crossing, for 1915. —*Concluded.*

| Day. | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.10 | 40 | 1.20 | 50 | 1.41 | 76.0 | 1.36 | 10.4 |
| 2 | 1.10 | 40 | 1.20 | 50 | 1.39 | 73.0 | 1.36 | 10.5 |
| 3 | 1.10 | 40 | 1.30 | 60 | 1.37 | 70.0 | 1.36 | 10.5 |
| 4 | 1.10 | 40 | 1.30 | 60 | 1.35 | 67.0 | 1.36 | 10.5 |
| 5 | 1.10 | 40 | 1.30 | 60 | 1.33 | 64.0 | 1.36 | 10.4 |
| 6 | 1.10 | 40 | 1.30 | 60 | 1.31 | 61.0 | 1.36 | 10.2 |
| 7 | 1.10 | 40 | 1.30 | 60 | 1.29 | 59.0 | 1.36 | 10.0 |
| 8 | 1.10 | 40 | 1.30 | 60 | 1.27 | 57.0 | 1.26 | 9.8 |
| 9 | 1.10 | 40 | 1.20 | 50 | 1.25 | 55.0 | 1.26 | 9.8 |
| 10 | 1.20 | 50 | 1.20 | 50 | 1.25 | 49.0*a* | 1.26 | 9.8 |
| 11 | 1.20 | 50 | 1.20 | 50 | 1.26 | 42.0 | 1.16 | 9.9 |
| 12 | 1.20 | 50 | 1.20 | 50 | 1.26 | 34.0 | 1.16 | 10.0 |
| 13 | 1.20 | 50 | 1.10 | 40 | 1.26 | 26.0 | 1.16 | 10.0 |
| 14 | 1.20 | 50 | 1.10 | 40 | 1.26 | 19.5 | 1.06 | 10.1 |
| 15 | 1.20 | 50 | 1.10 | 40 | 1.27 | 17.0 | 1.06 | 10.1 |
| 16 | 1.30 | 60 | 1.20 | 50 | 1.27 | 16.9 | 1.05 | 10.2 |
| 17 | 1.30 | 60 | 1.20 | 50 | 1.37 | 16.9 | 1.05*b* | 10.2 |
| 18 | 1.30 | 60 | 1.21 | 51 | 1.37 | 17.0 | 1.05*b* | 10.1 |
| 19 | 1.20 | 50 | 1.21 | 51 | 1.37 | 17.0 | 1.05 | 10.1 |
| 20 | 1.20 | 50 | 1.21 | 51 | 1.37 | 16.9 | 1.05 | 10.0 |
| 21 | 1.20 | 50 | 1.21 | 51 | 1.37 | 16.3 | 1.05 | 10.0 |
| 22 | 1.20 | 50 | 1.21 | 51 | 1.37 | 15.7 | 1.04 | 10.1 |
| 23 | 1.20 | 50 | 1.21 | 51 | 1.37 | 15.0 | 1.04 | 9.9 |
| 24 | 1.20 | 50 | 1.21 | 51 | 1.37 | 14.2 | 1.04 | 9.7 |
| 25 | 1.20 | 50 | 1.21 | 51 | 1.37 | 13.5 | 1.04 | 9.2 |
| 26 | 1.20 | 50 | 1.31 | 61 | 1.27 | 12.8 | 1.04 | 9.0 |
| 27 | 1.30 | 60 | 1.31 | 61 | 1.27 | 12.0 | 1.04 | 8.9 |
| 28 | 1.30 | 60 | 1.33 | 64 | 1.26 | 11.1 | 1.03 | 8.5 |
| 29 | 1.20 | 50 | 1.35 | 67 | 1.26 | 10.9 | 1.03 | 8.2 |
| 30 | 1.20 | 50 | 1.37 | 70 | 1.26 | 10.6 | 1.03 | 7.8 |
| 31 | ..... | ..... | 1.39 | 73 | ..... | ..... | 1.03 | 7.5 |

*a* Ice conditions after Nov. 10.
*b* Gauge heights interpolated.

MONTHLY DISCHARGE of North Heart River at Peace River Crossing, for 1915.

(Drainage area *a* square miles.)

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | |
| June (1-30) | 514.0 | 128.0 | 357.0 | 21,243 |
| July | 514.0 | 90.0 | 345.0 | 21,213 |
| August | 262.0 | 40.0 | 91.0 | 5,595 |
| September | 60.0 | 40.0 | 49.0 | 2,916 |
| October | 73.0 | 40.0 | 54.0 | 3,320 |
| November | 76.0 | 10.6 | 33.0 | 1,964 |
| December (1-31) | 10.5 | 7.5 | 9.7 | 596 |
| The period | ..... | ..... | ..... | 56,847 |

*a* Unable to obtain accurate drainage area from plans available.

PEACE RIVER AT PEACE RIVER CROSSING.

*Location.*—On the NW. ¼ Sec. 29, Tp. 83, Rge. 21, W. 5th Mer., about 1200 feet below mouth of the Heart River 300 feet north of Mr. H. White's house.

*Records Available.*—May 28, 1915, to December 31, 1915.

*Gauge.*—Vertical staff, on left bank of river. Elevation of zero maintained at 70.70 feet May 28 to November 13. Elevation of zero maintained at 68.82 feet November 13 to December 31.

*Bench-mark.*—Spike driven in stump of poplar tree, on left bank about 200 feet upstream from gauge. Assumed elevation 93.61 feet.

*Channel.*—One channel at all stages, fairly permanent.

*Discharge Measurements.*—Made from ferry boat at ferry crossing, about 150 feet above mouth of Heart River. Discharge of Heart River was added to discharge of Peace River when curve was plotted.

*Winter flow.*—River affected by ice from November to May.

*Observer.*—Henry White.

DISCHARGE MEASUREMENTS of Peace River at Peace River Crossing, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 27 and 28 | P. H. Daniells | 1,500 | 24,117 | 6.57 | 10.80 | 158,449 |
| June 24 | do | 1,456 | 22,690 | 6.22 | 9.95 | 141,234 |
| July 14 | do | 1,610 | 41,412 | 8.17 | 20.50 | 338,337 |
| Aug. 17 | do | 1,237 | 17,040 | 3.34 | 3.95 | 56,843 |
| Oct. 18 | do | 1,129 | 12,278 | 1.81 | 0.98 | 22,374 |

NOTE.—Discharge above mouth of Heart River.

DISCHARGE MEASUREMENTS of Peace River at Peace River Crossing, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 27 and 28 | P. H. Daniells | ..... | ..... | ..... | 10.80 | 158,577 |
| June 24 | do | ..... | ..... | ..... | 9.95 | 141,557 |
| July 14 | do | ..... | ..... | ..... | 20.50 | 338,851 |
| Aug. 17 | do | ..... | ..... | ..... | 3.95 | 56,903 |
| Oct. 18 | do | ..... | ..... | ..... | 0.98 | 22,435 |
| Dec. 13 | I. R. Strome | 1,335 | 18,353 | 0.58 | 4.76 | 10,604 |

NOTE.—Discharge below mouth of Heart River. At gauge.

DAILY GAUGE HEIGHT AND DISCHARGE of Peace River at Peace River Crossing, for 1915.

| Day. | May. | | June. | | July. | | August. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 10.60 | 153,600 | 9.20 | 130,950 | 6.80 | 95,550 |
| 2 | ..... | ..... | 10.10 | 145,350 | 8.80 | 124,850 | 6.30 | 88,550 |
| 3 | ..... | ..... | 9.80 | 140,500 | 8.40 | 118,850 | 6.30 | 88,550 |
| 4 | ..... | ..... | 9.60 | 137,300 | 8.10 | 114,350 | 6.10 | 85,750 |
| 5 | ..... | ..... | 9.90 | 142,100 | 7.90 | 111,400 | 6.00 | 84,350 |
| 6 | ..... | ..... | 9.80 | 140,500 | 7.50 | 105,600 | 5.70 | 80,300 |
| 7 | ..... | ..... | 9.70 | 138,900 | 7.50 | 105,600 | 5.60 | 78,950 |
| 8 | ..... | ..... | 9.50 | 135,700 | 7.60 | 107,050 | 5.60 | 78,950 |
| 9 | ..... | ..... | 9.45 | 134,900 | 7.40 | 104,150 | 5.40 | 76,250 |
| 10 | ..... | ..... | 9.50 | 135,700 | 7.30 | 102,700 | 5.20 | 73,550 |
| 11 | ..... | ..... | 9.50 | 135,700 | 7.35 | 103,425 | 5.10 | 72,200 |
| 12 | ..... | ..... | 9.80 | 140,500 | 14.50 | 224,850 | 4.80 | 68,150 |
| 13 | ..... | ..... | 9.45 | 134,900 | 19.30 | 316,050 | 4.60 | 65,450 |
| 14 | ..... | ..... | 9.40 | 134,100 | 20.50 | 338,850 | 4.40 | 62,800 |
| 15 | ..... | ..... | 9.50 | 135,700 | 18.30 | 297,050 | 4.20 | 60,200 |
| 16 | ..... | ..... | 9.40 | 134,100 | 15.10 | 336,250 | 4.00 | 57,600 |
| 17 | ..... | ..... | 9.70 | 138,900 | 14.50 | 224,850 | 3.90 | 56,400 |
| 18 | ..... | ..... | 10.75 | 156,075 | 13.70 | 209,650 | 3.80 | 55,200 |
| 19 | ..... | ..... | 12.30 | 183,400 | 12.90 | 194,500 | 3.65 | 53,400 |
| 20 | ..... | ..... | 12.20 | 181,550 | 12.10 | 179,700 | 3.60 | 52,800 |
| 21 | ..... | ..... | 11.30 | 165,350 | 10.80 | 156,900 | 3.70 | 54,000 |
| 22 | ..... | ..... | 10.60 | 153,600 | 9.90 | 142,100 | 3.95 | 57,000 |
| 23 | ..... | ..... | 10.20 | 147,000 | 9.30 | 132,500 | 3.80 | 55,200 |
| 24 | ..... | ..... | 9.70 | 138,900 | 9.10 | 129,400 | 3.60 | 52,800 |
| 25 | ..... | ..... | 9.35 | 133,300 | 8.90 | 126,350 | 3.55 | 52,200 |
| 26 | ..... | ..... | 9.10 | 129,400 | 8.60 | 121,850 | 3.30 | 49,200 |
| 27 | ..... | ..... | 9.40 | 134,100 | 8.30 | 117,350 | 3.20 | 48,000 |
| 28 | 10.80 | 156,900 | 10.40 | 150,300 | 8.10 | 114,350 | 3.10 | 46,800 |
| 29 | 11.30 | 165,350 | 10.40 | 150,300 | 8.00 | 112,850 | 2.90 | 44,400 |
| 30 | 11.20 | 163,600 | 10.10 | 145,350 | 7.60 | 107,050 | 2.85 | 43,800 |
| 31 | 11.00 | 160,200 | ..... | ..... | 7.30 | 102,700 | 2.95 | 45,000 |

DAILY GAUGE HEIGHT AND DISCHARGE of Peace River at Peace River Crossing, for 1915.

| Day. | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.85 | 43,800 | 1.00 | 22,600 | 2.75 | 42,600 | 2.62 | 11,120 |
| 2 | 2.60 | 40,800 | 0.95 | 22,050 | 2.60 | 40,800 | 2.72 | 11,100 |
| 3 | 2.65 | 41,400 | 0.90 | 21,500 | 2.30 | 37,200 | 2.67 | 11,120 |
| 4 | 2.55 | 40,200 | 0.95 | 22,050 | 2.00 | 33,600 | 2.72 | 11,120 |
| 5 | 2.25 | 36,600 | 1.05 | 23,150 | 1.70 | 30,300 | 2.67 | 11,140 |
| 6 | 2.30 | 37,200 | 1.05 | 23,150 | 1.40 | 27,000 | 2.67 | 11,140 |
| 7 | 2.20 | 36,000 | 1.00 | 22,600 | 1.20 | 24,800 | 2.62 | 11,050 |
| 8 | 2.15 | 35,400 | 1.00 | 22,600 | 1.60 | 29,200 | 2.67 | 11,000 |
| 9 | 2.30 | 37,200 | 1.00 | 22,600 | 1.10 | 23,700 | 2.87 | 10,900 |
| 10 | 2.20 | 36,000 | 1.00 | 22,600 | 0.80 | 20,400 | 2.82 | 10,720 |
| 11 | 2.00 | 33,600 | 0.95 | 22,050 | 0.60 | 18,200 | 2.87 | 10,630 |
| 12 | 1.95 | 33,050 | 0.90 | 21,500 | 0 30 | 14,900 | 2.87 | 10,600 |
| 13 | 1.90 | 32,500 | 0.88 | 21,280 | 0.00 | 11,600 | 2.87 | 10,620 |
| 14 | 1.80 | 31,400 | 0.85 | 20,950 | 1.25 | 11,540*a* | 2.87 | 10,690 |
| 15 | 1.70 | 30,300 | 0.85 | 20,950 | 1.25 | 11,540 | 2.87 | 10,740 |
| 16 | 1.65 | 29,750 | 0.85 | 20,950 | 1.30 | 11,560 | 2.87 | 10,770 |
| 17 | 1.50 | 28,100 | 0.85 | 20,950 | 1.35 | 11,580 | 2.87 | 10,770 |
| 18 | 1.30 | 25,900 | 1.02 | 22,820 | 1.75 | 11,560 | 2.87 | 10,730 |
| 19 | 1.45 | 27,550 | 1.09 | 23,590 | 2.30 | 11,510 | 2.87 | 10,720 |
| 20 | 1.50 | 28,100 | 1.96 | 33,160 | 2.30 | 11,500 | 2.87 | 10,740 |
| 21 | 1.60 | 29,200 | 2.13 | 35,160 | 2.22 | 11,490 | 2.87 | 10,790 |
| 22 | 1.70 | 30,300 | 2.50 | 39,600 | 2.15 | 11,490 | 2.87 | 10,750 |
| 23 | 1.65 | 29,750 | 2.47 | 39,240 | 2.40 | 11,500 | 2.87 | 10,700 |
| 24 | 1.50 | 28,100 | 2.24 | 36,480 | 2.70 | 11,490 | 2.87 | 10,700 |
| 25 | 1.40 | 27,000 | 2.06 | 34,320 | 2.50 | 11,490 | 2.87 | 10,650 |
| 26 | 1.35 | 26,450 | 1.88 | 32,280 | 2.15 | 11,430 | 2.92 | 10,600 |
| 27 | 1.40 | 27,000 | 2.01 | 33,720 | 2.08 | 11,370 | 2.92 | 10,500 |
| 28 | 1.30 | 25,900 | 2.04 | 34,080 | 2.52 | 11,300 | 2.92 | 10,420 |
| 29 | 1.20 | 24,800 | 1.87 | 32,170 | 2.62 | 11,220 | 2.92 | 10,300 |
| 30 | 1.10 | 23,700 | 2.40 | 38,400 | 2.62 | 11,160 | 2.92 | 10,250 |
| 31 | ..... | ..... | 2.78 | 42,960 | ..... | ..... | 2.87 | 10,300 |

*a* Ice conditions.

MONTHLY DISCHARGE of Peace River at Peace River Crossing, for 1915.

(Drainage area *a* square miles.)

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| May (28–31) | 165,350 | 156,900 | 161,512 | 1,281,113 |
| June | 183,400 | 129,400 | 141,236 | 8,582,924 |
| July | 338,850 | 102,700 | 158,518 | 9,747,116 |
| August | 95,550 | 43,800 | 63,979 | 3,933,919 |
| September | 43,800 | 23,700 | 31,902 | 1,898,318 |
| October | 42,960 | 20,950 | 27,468 | 1,688,948 |
| November | 42,600 | 11,160 | 18,301 | 1,088,985 |
| December (1–31) | 11,140 | 10,250 | 10,786 | 663,205 |
| The period | ..... | ..... | ..... | 28,884,528 |

*a* Unable to obtain accurate drainage area from plans available.

PEACE RIVER AT FORT VERMILION.

*Location.*—On the SE. ¼ Sec. 23, Tp. 108, Rge. 13, W. 5th Mer. at the mounted police barracks, about one mile west of the Hudson's Bay Company's store. Winter section NE. ¼ Sec. 24, Tp. 108, Rge. 13, W. 5th.

*Records available.*—August 8, 1915, to November 5, 1915, and December 16-31, 1915.

*Gauge.*—Vertical staff; elevation of zero maintained at 66.50 feet. Winter gauge elevation of zero 68.81 feet.

*Bench-mark.*—Spike driven in four inch poplar stump; 300 feet upstream from gauge, 150 feet from edge of river; assumed elevation 100.00 feet.

*Channel.*—One channel at all stages, shifting.

*Discharge measurement.*—Made from boat, about one and one-half miles below gauge at Hudson's Bay Company's east property line.

*Winter flow.*—River affected by ice from November to May.

*Observer.*—R. W. McLeod.

DISCHARGE MEASUREMENTS of Peace River at Fort Vermilion, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Aug. 8 | P. H. Daniells | 1,814 | 37,161 | 2.19 | 13.11 | 81,530 |
| Sept. 15, 16, 17 | do | 1,745 | 27,356 | 1.10 | 7.40 | 30,128 |
| Sept. 29 | do | 1,741 | 27,282 | 1.05 | 7.00 | 27,414 |
| Oct. 4 | do | 1,734 | 26,598 | 0.98 | 6.48 | 26,159 |
| Dec. 17–20 | do | 1,100 | 19,424 | 0.65 | 3.22 | 12,648 |
| Dec. 22–24 | do | 1,100 | 19,146 | 0.57 | 2.95 | 10,930 |
| Dec. 27, 28 | do | 1,100 | 18,791 | 0.56 | 2.78 | 10,485 |
| Dec. 30, 31 | do | 1,110 | 19,036 | 0.62 | 3.08 | 11,874 |

DAILY GAUGE HEIGHT AND DISCHARGE of Peace River at Fort Vermilion, for 1915.

| Day. | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | | | 9.57 | 46,660 | 6.80 | 27,000 | 7.90 | | | |
| 2 | | | 9.47 | 45,760 | 6.70 | 26,550 | 8.00 | | | |
| 3 | | | 9.37 | 44,960 | 6.55 | 25,875 | 8.10 | | | |
| 4 | | | 9.27 | 44,160 | 6.45 | 25,425 | 8.20 | | | |
| 5 | | | 9.04 | 42,320 | 6.40 | 25,200 | 8.45 | | | |
| 6 | | | 8.89 | 41,120 | 6.30 | 24,800 | | | | |
| 7 | | | 8.64 | 39,120 | 6.30 | 24,800 | | | | |
| 8 | 13.11 | 81,600 | 8.44 | 37,520 | 6.30 | 24,800 | | | | |
| 9 | 12.99 | 80,400 | 8.24 | 35,920 | 6.30 | 24,800 | | | | |
| 10 | 12.79 | 78,400 | 8.07 | 34,690 | 6.30 | 24,800 | | | | |
| 11 | 12.59 | 76,400 | 7.97 | 33,990 | 6.30 | 24,800 | | | | |
| 12 | 12.39 | 74,400 | 7.87 | 33,290 | 6.30 | 24,800 | | | | |
| 13 | 12.19 | 72,400 | 7.77 | 32,590 | 6.30 | 24,800 | | | | |
| 14 | 11.99 | 70,400 | 7.64 | 31,640 | 6.30 | 24,800 | | | | |
| 15 | 11.79 | 68,400 | 7.44 | 30,440 | 6.20 | 24,400 | | | | |
| 16 | 11.49 | 65,400 | 7.50 | 30,800 | 6.20 | 24,400 | | | 3.20 | 12,650 |
| 17 | 11.29 | 63,400 | 7.20 | 29,000 | 6.20 | 24,400 | | | 3.20 | 12,650 |
| 18 | 11.09 | 61,400 | 7.15 | 28,750 | 6.20 | 24,400 | | | 3.22 | 12,648 |
| 19 | 10.79 | 58,400 | 7.10 | 28,500 | 6.15 | 24,200 | | | 3.23 | 12,648 |
| 20 | 10.69 | 57,400 | 7.10 | 28,500 | 6.10 | 24,000 | | | 3.23 | 12,750 |
| 21 | 10.49 | 55,400 | 6.95 | 27,750 | 6.10 | 24,000 | | | 3.21 | 12,700 |
| 22 | 10.39 | 54,405 | 6.70 | 26,550 | 6.10 | 24,000 | | | 3.06 | 11,200 |
| 23 | 10.39 | 54,405 | 6.50 | 25,650 | 6.00 | 23,600 | | | 2.95 | 10,930 |
| 24 | 10.39 | 54,405 | 7.50 | 30,800 | 6.00 | 23,600 | | | 2.85 | 10,700 |
| 25 | 10.39 | 54,405 | 7.25 | 29,300 | 6.00 | 23,600 | | | 2.76 | 10,475 |
| 26 | 10.39 | 54,405 | 7.20 | 29,000 | 6.10*a* | | | | 2.70 | 10,350 |
| 27 | 10.29 | 53,455 | 7.15 | 28,750 | 6.10 | | | | 2.67 | 10,250 |
| 28 | 10.19 | 52,505 | 7.00 | 28,000 | 6.50 | | | | 2.82 | 10,750 |
| 29 | 10.04 | 51,080 | 6.90 | 27,500 | 6.85 | | | | 2.94 | 11,250 |
| 30 | 9.84 | 49,180 | 6.80 | 27,000 | 7.10 | | | | 3.04 | 11,725 |
| 31 | 9.74 | 48,260 | | | 7.50 | | | | 3.10*a* | 11,950 |

*a* to *a* Ice conditions Oct. 26 to Dec. 31.
No gauge heights obtained from Nov. 6 to Dec. 15 inclusive.

PLATE 5

View looking upstream from Peace River Crossing, showing mouth of North Heart River and location of ferry. Taken on June 6, 1915, by P. H. Daniells.

PLATE 6

Hudson's Bay Company Post at Fort Vermilion, on Peace River. Taken on August 10, 1915, by P. H. Daniells.

MONTHLY DISCHARGE of Peace River at Fort Vermilion, for 1915.

(Drainage area *a* square miles.)

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | |
| August (8–31) | 81,600 | 48,260 | 62,096 | 2,955,273 |
| September | 46,660 | 25,650 | 33,334 | 1,983,510 |
| October (1–25) | 27,000 | 23,600 | 24,714 | 1,225,197 |
| December (16–31) | 12,750 | 10,250 | 11,602 | 368,108 |
| The period | ..... | ..... | ..... | 6,532,088 |

*a* Unable to obtain accurate drainage area from plans available.

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Peace River drainage basin, in 1915.

| Date. | Engineer. | Stream. | Location. | Width. | Area of Section. | Mean Velocity. | Discharge. |
|---|---|---|---|---|---|---|---|
| | | | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Sec.-ft.* |
| Aug. 12 | P. H. Daniells | Battle River | 96–20–5 | 85 | 118 | 2.93 | 346 |
| Sept. 8 | do | do | do | 53 | 36 | 2.19 | 79 |
| Aug. 12 | do | Buffalo River | 102–20–5 | 55 | 65 | 2.68 | 174 |
| Sept. 10 | do | do | do | 28 | 26 | 3.46 | 97 |
| Sept. 7 | do | Cadotte River | 19–89–21–5 | 45 | 58 | 3.24 | 188 |
| Aug. 26 | do | Little Smoky River | 15–77–14–5 | 138 | 534 | 1.78 | 952 |
| Sept. 7 | do | White Mud River | 25–88–21–5 | 31 | 37 | 3.32 | 123 |

## ATHABASKA RIVER DRAINAGE BASIN.

### *General Description.*

Athabaska River rises on the eastern slope of the Rocky Mountains and flows in a northeasterly direction for about one thousand miles, eventually emptying into Lake Athabaska.

The Athabaska basin forms the most southerly portion of the great MacKenzie system and the portion dealt with in this report comprises only the headwaters.

Rising in country very similar to the watershed of the other streams of importance in Alberta, it flows out of the mountains and then through foothill country. From the foothills to the lake the basin consists of stretches of muskeg and uplands, well timbered with spruce and pine.

The general character of the basin is such that the winter precipitation or snowcover is conserved to a great extent and floods in the early spring are not usual. However, in June, July and August rains and warm winds cause the upper parts of the system to discharge large quantities of the snow water from the higher peaks and glaciers, and when rains of any magnitude occur the invariable result is a flood. The muskeg country is a great source of storage, but when its capacity is reached, it accelerates rather than retards the run-off.

The main transcontinental lines of the Grand Trunk Pacific and the Canadian Northern railway cross the upper portion of this drainage basin, and transportation is now a much easier problem than in the past.

Many valuable deposits of coal, limestone and other minerals are found in this basin, and, on account of these as well as the many power possibilities and stretches of timber and pulpwood, it is expected that this country will develop very much during the next few years.

A very full description of this drainage basin was published as an appendix to the 1913 report.

A special report upon the floods in this drainage basin is given in Appendix No. 4 of this report.

MIETTE RIVER NEAR JASPER.

*Location.*—On the SW. ¼ Sec. 9, Tp. 45, Rge. 1, W. 6th Mer., at a traffic bridge about 2 miles southwest of Jasper and about one mile from the mouth of the river.

*Records available.*—Gauge heights available from May 23, 1914, to December 31, 1915. Discharge measurements available from February 13, 1913, to December 31, 1915.

*Gauge.*—Vertical staff, on downstream side of bridge pier, about 20 feet from the left bank, and maintained at zero elevation of 3,383.41 feet since establishment.

*Bench-mark.*—Six inch spike driven in 15 inch spruce tree on the left bank of the river and about 30 feet east of the gauge. Elevation 3,395.17 feet. (Grand Trunk Pacific Railway datum.)

*Channels.*—Three channels at all stages, slightly shifting.

*Discharge measurements.*—Made from a bridge.

*Winter flow.*—River affected by ice from November to April. Discharge measurements made at a point about 1000 feet downstream from regular section.

*Floods.*—Floods occurred on June 26 and 27, the maximum gauge height being 11.55 feet. The river overflowed its banks at a gauge height of 9 feet. The maximum discharge (estimated) was 3,000 second feet.

*Observer.*—Matt Crevie, January 1 to January 23. D. Gallacher, January 24 to February 10. A. B. Webb, February 11 to December 31.

DISCHARGE MEASUREMENTS of Miette River near Jasper, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 18 | R. J. McGuinness | 45.0 | 107 | 0.22 | 1.96 | 24.0 |
| Feb. 10 | do | 39.0 | 89 | 0.30 | 2.11 | 27.0 |
| Mar. 17 | J. M. Paul | 39.0 | 71 | 0.28 | 1.72 | 19.9 |
| April 10 | do | 47.0 | 158 | 0.53 | 0.51 | 90.0 |
| April 24 | do | 72.5 | 287 | 0.61 | 1.45 | 174.0 |
| May 15 | do | 75.5 | 336 | 1.39 | 3.18 | 468.0 |
| June 3 | do | 75.5 | 467 | 1.52 | 4.14 | 711.0 |
| June 24 | do | 75.5 | 512 | 1.69 | 4.71 | 866.0 |
| June 28 | do | 75.5 | 818 | 2.28 | 7.95 | 1,867.0 |
| June 29 | do | 75.5 | 717 | 1.95 | 6.62 | 1,401.0 |
| July 12 | do | 75.5 | 531 | 1.73 | 4.93 | 919.0 |
| July 29 | do | 75.5 | 436 | 1.32 | 3.62 | 577.0 |
| Aug. 16 | do | 75.5 | 428 | 1.10 | 3.31 | 473.0 |
| Aug. 31 | do | 75.5 | 394 | 1.03 | 3.05 | 406.0 |
| Sept. 20 | do | 72.5 | 301 | 0.66 | 1.64 | 199.0 |
| Oct. 5 | do | 72.5 | 288 | 0.56 | 1.44 | 162.0 |
| Oct. 25 | do | 72.5 | 290 | 0.47 | 1.44 | 135.0 |
| Nov. 22 | do | 43.0 | 121 | 0.66 | 1.40 | 80.0 |
| Dec. 13 | do | 43.0 | 105 | 0.45 | 1.34 | 47.0 |
| Dec. 19 | do | 43.0 | 99 | 0.48 | 1.38 | 48.0 |
| Dec. 31 | R. J. McGuinness | 42.0 | 93 | 0.42 | 1.29 | 39.0 |

DAILY GAUGE HEIGHT AND DISCHARGE of Miette River near Jasper, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.12 | 45*a* | 2.01 | 23 | 1.57 | 20 | 0.30 | 77 | 2.40 | 301 | 4.65 | 842 |
| 2 | 2.15 | 44 | 1.91 | 26 | 1.42 | 15 | 0.33 | 79 | 2.30 | 284 | 4.75 | 870 |
| 3 | 2.14 | 43 | 2.01 | 29 | 1.62 | 18 | 0.49 | 88 | 2.35 | 292 | 4.15 | 704 |
| 4 | 2.08 | 44 | 2.16 | 21 | 1.67 | 20 | 0.68 | 101 | 3.00 | 418 | 4.20 | 718 |
| 5 | 2.10 | 41 | 1.96 | 25 | 1.72 | 16 | 0.90 | 118 | 3.30 | 485 | 4.35 | 758 |
| 6 | 2.07 | 43 | 2.06 | 24 | 1.61 | 21 | 0.80 | 110 | 4.10 | 691 | 4.25 | 732 |
| 7 | 2.10 | 44 | 2.04 | 23 | 1.76 | 23 | 0.70 | 102 | 4.55 | 814 | 3.90 | 638 |
| 8 | 2.12 | 43 | 2.01 | 20 | 1.78 | 25 | 0.67 | 100 | 5.10 | 970 | 3.90 | 638 |
| 9 | 2.08 | 42 | 2.11 | 24 | 1.78 | 27 | 0.60 | 95 | 5.40 | 1,057 | 4.45 | 786 |
| 10 | 2.06 | 38 | 2.11 | 27 | 1.81 | 28 | 0.53 | 91 | 5.75 | 1,158 | 4.10 | 691 |
| 11 | 2.05 | 33 | 2.11 | 30 | 1.82 | 30 | 0.58 | 94 | 5.33 | 1,037 | 3.80 | 612 |
| 12 | 2.06 | 30 | 2.16 | 31 | 1.80 | 29 | 0.60 | 95 | 5.25 | 1,014 | 3.85 | 625 |
| 13 | 2.03 | 34 | 2.03 | 28 | 1.73 | 27 | 0.90 | 118 | 4.00 | 664 | 4.15 | 704 |
| 14 | 2.10 | 35 | 1.96 | 25 | 1.60 | 26 | 0.95 | 122 | 3.55 | 548 | 4.45 | 786 |
| 15 | 2.13 | 26 | 2.01 | 25 | 1.85 | 25 | 0.95 | 122 | 3.20 | 462 | 4.60 | 828 |
| 16 | 2.04 | 15 | 2.03 | 28 | 1.97 | 30 | 0.98 | 124 | 2.80 | 376 | 5.30 | 1,028 |
| 17 | 1.90 | 19 | 1.98 | 31 | 1.69 | 20*a* | 1.45 | 168 | 2.90 | 396 | 5.70 | 1,144 |
| 18 | 1.97 | 24 | 1.80 | 29 | 1.64 | 25*b* | 1.50 | 174 | 2.95 | 407 | 5.05 | 956 |
| 19 | 2.00 | 26 | 1.68 | 26 | 1.56 | 10 | 1.65 | 192 | 3.90 | 638 | 4.55 | 814 |
| 20 | 2.04 | 21 | 1.65 | 19 | 1.24 | 10 | 1.70 | 198 | 4.70 | 856 | 4.60 | 828 |
| 21 | 1.61 | 17 | 1.60 | 16 | 1.09 | 8 | 1.65 | 192 | 5.50 | 1,086 | 4.50 | 800 |
| 22 | 2.17 | 30 | 1.57 | 14 | 0.79 | 20 | 1.40 | 163 | 5.20 | 999 | 4.40 | 772 |
| 23 | 2.15 | 30 | 1.44 | 17 | 0.69 | 17 | 1.25 | 148 | 4.95 | 926 | 4.80 | 884 |
| 24 | 2.21 | 32 | 1.47 | 21 | 0.46 | 24 | 1.45 | 168 | 4.80 | 884 | 4.70 | 856 |
| 25 | 2.01 | 26 | 1.50 | 24 | 0.24 | 42 | 1.50 | 174 | 4.30 | 745 | 5.10 | 970 |
| 26 | 1.76 | 19 | 1.64 | 22 | 0.29 | 64 | 1.65 | 192 | 4.10 | 691 | 11.55 | 2,996 |
| 27 | 1.81 | 19 | 1.58 | 24 | 0.14 | 62 | 1.63 | 190 | 4.00 | 664 | 9.85 | 2,452 |
| 28 | 2.31 | 24 | 1.78 | 26 | 0.09 | 60*b* | 1.45 | 168 | 3.90 | 638 | 8.00 | 1,860 |
| 29 | 2.51 | 30 | ..... | ..... | 0.19 | 72*c* | 1.55 | 180 | 4.10 | 691 | 6.70 | 1,446 |
| 30 | 1.76 | 17 | ..... | ..... | 0.29 | 76 | 2.55 | 328 | 3.80 | 612 | 6.50 | 1,384 |
| 31 | 1.81 | 24 | ..... | ..... | 0.27 | 76 | ..... | ..... | 3.70 | 586 | ..... | ..... |

*a* Ice conditions January 1 to March 17.
*b* Ice breakup March 18 to 28; discharges estimated.
*c* Open water March 29 to Nov. 2.

DAILY HAUGE HEIGHT AND DISCHARGE of Miette River near Jasper, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 6.35 | 1,338 | 3.65 | 573 | 2.90 | 396 | 1.25 | 148 | 1.50 | 174 | 1.34 | 58 |
| 2 | 6.00 | 1,232 | 3.95 | 651 | 2.40 | 301 | 1.20 | 144 | 1.35 | 158*c* | 1.42 | 51 |
| 3 | 5.50 | 1,086 | 4.10 | 691 | 2.30 | 284 | 1.35 | 158 | 1.00 | 134*d* | 1.45 | 56 |
| 4 | 5.00 | 941 | 4.00 | 664 | 2.30 | 284 | 1.50 | 174 | 0.95 | 115 | 1.50 | 57 |
| 5 | 5.00 | 941 | 3.65 | 573 | 2.30 | 284 | 1.44 | 167 | 1.20 | 129 | 1.25 | 50 |
| 6 | 5.20 | 999 | 3.55 | 548 | 2.25 | 276 | 1.25 | 148 | 1.10 | 115 | 1.20 | 42 |
| 7 | 5.00 | 941 | 3.55 | 548 | 2.10 | 252 | 1.20 | 144 | 1.00 | 120 | 1.15 | 37 |
| 8 | 4.60 | 828 | 3.50 | 535 | 2.00 | 237 | 1.25 | 148 | 1.30 | 128 | 1.45 | 35 |
| 9 | 4.40 | 772 | 3.30 | 485 | 2.00 | 237 | 1.25 | 148 | 1.55 | 131 | 1.50 | 46 |
| 10 | 4.45 | 786 | 3.30 | 485 | 1.90 | 223 | 1.10 | 135 | 1.50 | 121 | 1.45 | 46 |
| 11 | 4.90 | 912 | 3.30 | 485 | 1.70 | 198 | 1.05 | 130 | 1.45 | 112 | 1.25 | 41 |
| 12 | 4.85 | 898 | 3.30 | 485 | 1.65 | 192 | 1.05 | 130 | 1.30 | 114 | 1.45 | 42 |
| 13 | 4.50 | 800 | 3.20 | 462 | 1.50 | 174 | 1.05 | 130 | 1.35 | 102 | 1.34 | 47 |
| 14 | 4.50 | 800 | 3.20 | 462 | 1.50 | 174 | 1.05 | 130 | 1.25 | 106 | 1.40 | 49 |
| 15 | 4.70 | 856 | 3.20 | 462 | 1.55 | 180 | 1.00 | 126 | 1.60 | 92*d* | 1.45 | 46 |
| 16 | 4.90 | 912 | 3.20 | 462 | 1.55 | 180 | 1.00 | 126 | 1.55 | 88*e* | 1.35 | 48 |
| 17 | 5.45 | 1,072 | 5.20 | 999 | 1.55 | 180 | 1.05 | 130 | 1.50 | 83 | 1.38 | 46 |
| 18 | 4.90 | 912 | 3.30 | 485 | 1.55 | 180 | 1.05 | 130 | 1.34 | 77 | 1.35 | 47 |
| 19 | 5.00 | 941 | 3.50 | 535 | 1.80 | 210 | 1.25 | 148 | 1.35 | 80 | 1.30 | 48 |
| 20 | 4.50 | 800 | 3.40 | 510 | 1.65 | 192 | 1.45 | 168 | 1.45 | 83 | 1.35 | 48 |
| 21 | 4.45 | 786 | 3.30 | 485 | 1.50 | 174 | 1.30 | 153 | 1.25 | 75 | 1.35 | 46 |
| 22 | 4.75 | 870 | 3.30 | 485 | 1.50 | 174 | 1.20 | 144 | 1.40 | 80 | 1.30 | 44 |
| 23 | 4.45 | 786 | 3.20 | 462 | 1.45 | 168 | 1.40 | 163 | 1.38 | 81 | 1.30 | 40 |
| 24 | 4.10 | 691 | 3.10 | 440 | 1.45 | 168 | 1.55 | 180 | 1.30 | 75 | 1.25 | 39 |
| 25 | 4.00 | 664 | 3.10 | 440 | 1.40 | 163 | 1.45 | 168 | 1.30 | 74 | 1.20 | 37 |
| 26 | 3.90 | 638 | 3.00 | 418 | 1.40 | 163 | 1.40 | 163 | 1.35 | 75 | 1.25 | 37 |
| 27 | 3.85 | 625 | 2.70 | 356 | 1.25 | 148 | 1.45 | 168 | 1.15 | 69 | 1.30 | 39 |
| 28 | 3.80 | 612 | 2.90 | 396 | 1.20 | 144 | 1.50 | 174 | 1.25 | 60 | 1.35 | 42 |
| 29 | 3.60 | 560 | 2.85 | 386 | 1.20 | 144 | 1.65 | 192 | 1.45 | 58 | 1.25 | 38 |
| 30 | 3.65 | 573 | 2.90 | 396 | 1.15 | 140 | 1.65 | 192 | 1.60 | 66 | 1.20 | 35 |
| 31 | 3.65 | 573 | 3.00 | 418 | ..... | ..... | 1.70 | 198 | ..... | ..... | 1.28 | 39*e* |

*c* Open water March 29 to Nov. 2.
*d* Ice forming Nov. 3 to 15; discharges estimated.
*e* Ice conditions Nov. 16 to Dec. 31.

MONTHLY DISCHARGE of Miette River near Jasper, for 1915.

(Drainage area 258 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 45 | 15 | 31 | 0.120 | 0.14 | 1,906 |
| February | 31 | 14 | 24 | 0.093 | 0.10 | 1,333 |
| March | 76 | 8 | 31 | 0.120 | 0.14 | 1,906 |
| April | 328 | 77 | 142 | 0.550 | 0.61 | 8,450 |
| May | 1,158 | 284 | 690 | 2.674 | 3.08 | 42,426 |
| June | 2,996 | 612 | 1,004 | 3.891 | 4.34 | 59,742 |
| July | 1,338 | 560 | 843 | 3.267 | 3.77 | 51,834 |
| August | 999 | 356 | 509 | 1.973 | 2.28 | 31,297 |
| September | 396 | 140 | 207 | 0.802 | 0.89 | 12,317 |
| October | 198 | 126 | 153 | 0.593 | 0.68 | 9,408 |
| November | 174 | 58 | 99 | 0.384 | 0.43 | 5,891 |
| December | 58 | 35 | 44 | 0.170 | 0.20 | 2,705 |
| The year | ..... | ..... | ..... | ..... | 16.66 | 229,215 |

ATHABASKA RIVER AT JASPER.

*Location.*—On the NW. ¼ Sec. 15, Tp. 45, Rge. 1, W. 6th Mer., about one-half mile east of the Grand Trunk Pacific station and three-quarters of a mile below the mouth of the Miette River.

*Records available.*—March 4, 1913, to December 31, 1915.

*Gauge.*—Vertical staff, on left bank and 800 feet below cable. Datum maintained at 3,360.70 feet during 1913, and at 3,360.68 feet during 1914 and 1915.

*Bench-mark.*—Permanent iron bench-mark 50 feet south of gauge; elevation 3,376.85 feet. (Grand Trunk Pacific Railway datum.)

*Channel.*—Slightly shifting.

*Discharge measurements.*—Made from a cable car.

*Winter flow.*—River affected by ice from November to April. Discharge measurements made at a point about 1½ miles below the regular station.

*Floods.*—Floods occurred on June 26 and 27, the maximum gauge height being 10.20 feet. As the banks are high no damage was done. The maximum discharge (estimated) was 19,500 feet.

*Observer.*—M. Crevie, January 1 to January 23. D. Gallacher, January 24 to February 10. A. B. Webb, February 11 to December 31.

DISCHARGE MEASUREMENTS of Athabaska River at Jasper, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 18 | R. J. McGuinness | 185 | 187 | 2.85 | 2.03 | 534 |
| Feb. 10 | do | 180 | 174 | 2.80 | 1.80 | 486 |
| Mar. 16 | J. M. Paul | 182 | 173 | 2.41 | 1.75 | 417 |
| April 10 | do | 185 | 196 | 2.51 | 1.92 | 493 |
| April 24 | do | 189 | 246 | 3.19 | 2.38 | 786 |
| May 15 | do | 267 | 608 | 4.98 | 4.40 | 3,026 |
| June 3 | do | 357 | 872 | 5.32 | 5.32 | 4,642 |
| June 28 | do | 414 | 2,255 | 7.01 | 8.84 | 15,806 |
| June 29 | do | 413 | 2,083 | 6.52 | 8.38 | 13,574 |
| July 14 | do | 407 | 1,349 | 5.73 | 6.62 | 7,731 |
| July 30 | do | 409 | 1,902 | 6.34 | 7.83 | 12,062 |
| Aug. 19 | do | 416 | 1,805 | 6.24 | 7.82 | 11,262 |
| Sept. 1 | do | 409 | 1,387 | 5.82 | 6.68 | 8,099 |
| Sept. 21 | do | 237 | 441 | 5.20 | 3.04 | 2,296 |
| Oct. 6 | do | 198 | 326 | 4.96 | 2.38 | 1,616 |
| Oct. 9 | do | 195 | 297 | 4.87 | 2.20 | 1,447 |
| Oct. 26 | do | 196 | 296 | 4.57 | 2.07 | 1,352 |
| Nov. 22 | do | 190 | 194 | 3.30 | 2.02 | 639 |
| Dec. 13 | do | 188 | 330 | 2.50 | 4.56 | 826 |
| Dec. 30 | R. J. McGuinness | 79 | 162 | 2.60 | 2.69 | 422 |

DAILY GAUGE HEIGHT AND DISCHARGE of Athabaska River at Jasper, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.72 | 540*a* | 2.05 | 488 | 1.73 | 435 | 1.82 | 440 | 2.85 | 1,135 | 5.20 | 4,400 |
| 2 | 3.78 | 552 | 1.85 | 484 | 1.71 | 432 | 1.87 | 465 | 3.00 | 1,280 | 5.50 | 5,000 |
| 3 | 3.75 | 560 | 1.95 | 481 | 1.70 | 429 | 2.25 | 685 | 3.10 | 1,380 | 5.30 | 4,600 |
| 4 | 3.62 | 561 | 2.05 | 488 | 1.70 | 428 | 2.32 | 734 | 3.25 | 1,530 | 5.40 | 4,800 |
| 5 | 3.45 | 563 | 1.95 | 489 | 1.73 | 428 | 2.22 | 664 | 3.50 | 1,800 | 5.70 | 5,420 |
| 6 | 3.54 | 562 | 2.00 | 485 | 1.69 | 428 | 2.13 | 608 | 4.10 | 2,560 | 5.60 | 5,210 |
| 7 | 3.01 | 560 | 2.05 | 486 | 1.69 | 428 | 2.16 | 626 | 4.05 | 2,490 | 6.00 | 6,120 |
| 8 | 2.73 | 555 | 2.10 | 488 | 1.69 | 428 | 2.08 | 578 | 5.75 | 5,530 | 6.00 | 6,120 |
| 9 | 2.69 | 545 | 1.85 | 490 | 1.69 | 426 | 1.99 | 525 | 5.50 | 5,000 | 6.00 | 6,120 |
| 10 | 2.42 | 542 | 1.80 | 486 | 1.69 | 425 | 1.94 | 500 | 6.00 | 6,120 | 5.20 | 4,400 |
| 11 | 2.27 | 543 | 1.79 | 476 | 1.70 | 423 | 1.95 | 505 | 5.70 | 5,420 | 5.10 | 4,200 |
| 12 | 2.26 | 542 | 1.81 | 467 | 1.72 | 422 | 2.08 | 578 | 5.60 | 5,210 | 5.20 | 4,400 |
| 13 | 2.24 | 537 | 1.78 | 464 | 1.70 | 421 | 2.20 | 650 | 5.00 | 4,000 | 5.50 | 5,000 |
| 14 | 2.13 | 534 | 1.78 | 463 | 1.72 | 421 | 2.18 | 638 | 4.60 | 3,320 | 5.65 | 5,315 |
| 15 | 2.05 | 533 | 1.75 | 463 | 1.75 | 419 | 2.20 | 650 | 4.40 | 3,010 | 5.85 | 5,760 |
| 16 | 1.99 | 533 | 1.78 | 462 | 1.75 | 417 | 2.25 | 685 | 4.10 | 2,560 | 6.50 | 7,360 |
| 17 | 2.01 | 534 | 1.79 | 459 | 1.80 | 415 | 2.55 | 895 | 4.25 | 2,785 | 7.10 | 9,150 |
| 18 | 2.00 | 534 | 1.76 | 450 | 1.85 | 417 | 2.55 | 895 | 4.30 | 2,860 | 6.60 | 7,630 |
| 19 | 1.99 | 530 | 1.74 | 441 | 1.85 | 424 | 2.65 | 970 | 4.70 | 3,480 | 6.55 | 7,495 |
| 20 | 2.11 | 528 | 1.71 | 439 | 1.86 | 426 | 2.72 | 1,026 | 5.40 | 4,800 | 6.60 | 7,630 |
| 21 | 1.99 | 525 | 1.70 | 439 | 1.84 | 429 | 2.59 | 923 | 6.10 | 6,360 | 6.60 | 7,630 |
| 22 | 2.87 | 518 | 1.70 | 439 | 1.94 | 437 | 2.46 | 832 | 6.00 | 6,120 | 6.50 | 7,360 |
| 23 | 2.98 | 515 | 1.69 | 439 | 2.02 | 437 | 2.44 | 818 | 6.00 | 6,120 | 7.10 | 9,150 |
| 24 | 2.96 | 518 | 1.70 | 438 | 1.89 | 431 | 2.32 | 734 | 5.75 | 5,530 | 7.00 | 8,820 |
| 25 | 2.46 | 526 | 1.71 | 439 | 1.74 | 415 | 2.50 | 860 | 5.50 | 5,000 | 7.50 | 10,500 |
| 26 | 2.16 | 532 | 1.72 | 440 | 1.73 | 407 | 2.60 | 930 | 5.55 | 5,105 | 9.60*c* | 18,620 |
| 27 | 2.21 | 534 | 1.72 | 439 | 1.78 | 408 | 2.60 | 930 | 5.25 | 4,500 | 9.85*c* | 19,620 |
| 28 | 2.71 | 529 | 1.72 | 438 | 1.81 | 409 | 2.50 | 860 | 5.00 | 4,000 | 8.65 | 14,825 |
| 29 | 2.96 | 519 | ..... | ..... | 1.73 | 403*a* | 2.60 | 930 | 5.50 | 5,000 | 8.30 | 13,460 |
| 30 | 2.91 | 504 | ..... | ..... | 1.73 | 402*b* | 3.15 | 1,430 | 5.20 | 4,400 | 8.10 | 12,680 |
| 31 | 2.96 | 494 | ..... | ..... | 1.81 | 435 | ..... | ..... | 5.10 | 4,200 | ..... | ..... |

*a* Ice conditions Jan. 1 to March 29.
*b* Open water March 30 to Nov. 2.
*c* G. H. is mean of observer's reading and H. W. L.

DAILY GAUGE HEIGHT AND DISCHARGE of Athabaska River at Jasper, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 8.00 | 12,300 | 7.85 | 11,745 | 6.60 | 7,900 | 2.85 | 2,075 | 2.25 | 1,500 | 1.24 | 640 |
| 2 | 7.65 | 11,020 | 7.90 | 11,930 | 6.70 | 8,160 | 2.75 | 1,970 | 2.05 | 1,340*b* | 1.29 | 640 |
| 3 | 7.50 | 10,500 | 9.00 | 16,220 | 5.60 | 5,790 | 2.85 | 2,075 | 2.25 | 1,284*d* | 1.49 | 650 |
| 4 | 7.65 | 11,020 | 8.50 | 14,240 | 6.50 | 7,650 | 2.90 | 2,130 | 2.00 | 1,224 | 2.14 | 654 |
| 5 | 7.70 | 11,200 | 8.00 | 12,300 | 6.00 | 6,550 | 2.80 | 2,020 | 2.15 | 1,172 | 1.04 | 655 |
| 6 | 7.90 | 11,930 | 8.00 | 12,300 | 5.90 | 6,360 | 2.34 | 1,576 | 2.06 | 1,140 | 0.62 | 657 |
| 7 | 8.20 | 13,070 | 7.95 | 12,115 | 5.10 | 4,960 | 2.30 | 1,540 | 2.06 | 1,160 | 0.52 | 664 |
| 8 | 8.00 | 12,300 | 8.00 | 12,300 | 4.55 | 4,130 | 2.25 | 1,500 | 1.96 | 1,082 | 0.47 | 696 |
| 9 | 7.60 | 10,840 | 8.00 | 12,300 | 4.00 | 3,410 | 2.20 | 1,460 | 1.96 | 910 | 0.72 | 718 |
| 10 | 7.45 | 10,330 | 8.00 | 12,300 | 3.95 | 3,345 | 2.10 | 1,380 | 1.76 | 825 | 3.97 | 731 |
| 11 | 6.90 | 8,500 | 8.00 | 12,300 | 3.60 | 2,920 | 2.01 | 1,308 | 1.57 | 780 | 4.30 | 757 |
| 12 | 6.50 | 7,360 | 7.95 | 12,115 | 3.50 | 2,800 | 2.06 | 1,348 | 1.57 | 768 | 3.40 | 802 |
| 13 | 6.45 | 7,230 | 7.90 | 11,930 | 3.20 | 2,460 | 2.06 | 1,348 | 1.52 | 755 | 4.85 | 826 |
| 14 | 6.60 | 7,630 | 7.80 | 11,560 | 3.00 | 2,240 | 2.01 | 1,308 | 1.47 | 743 | 3.50 | 828 |
| 15 | 7.00 | 8,820 | 7.75 | 11,380 | 3.10 | 2,350 | 2.01 | 1,308 | 1.77 | 780 | 4.10 | 830 |
| 16 | 6.80 | 8,200 | 8.10 | 12,680 | 3.00 | 2,240 | 1.97 | 1,279 | 1.73 | 760 | 3.70 | 840 |
| 17 | 7.00 | 8,820 | 8.00 | 12,300 | 3.00 | 2,240 | 2.02 | 1,316 | 1.68 | 737 | 3.90 | 845 |
| 18 | 6.85 | 8,350 | 8.10 | 12,680 | 3.00 | 2,240 | 2.22 | 1,476 | 1.43 | 659 | 4.60 | 849 |
| 19 | 7.00 | 8,820 | 7.90 | 11,930 | 3.00 | 2,240 | 2.52 | 1,740 | 1.78 | 667 | 4.30 | 851 |
| 20 | 7.00 | 8,820 | 7.90 | 11,930 | 3.30 | 2,570 | 2.62 | 1,840 | 1.78 | 658 | 4.00 | 853 |
| 21 | 6.90 | 8,500 | 7.90 | 11,930 | 3.00 | 2,240 | 2.48 | 1,702 | 1.73 | 648 | 2.29 | 850 |
| 22 | 7.85 | 11,745 | 8.00 | 12,300 | 3.00 | 2,240 | 2.28 | 1,524 | 2.03 | 639 | 1.99 | 825 |
| 23 | 7.75 | 11,380 | 8.00 | 12,300 | 2.95 | 2,185 | 2.48 | 1,702 | 1.88 | 635 | 1.29 | 790 |
| 24 | 7.35 | 9,990 | 7.90 | 11,930 | 2.95 | 2,185 | 2.63 | 1,850 | 1.68 | 635 | 0.79 | 720 |
| 25 | 7.20 | 9,480 | 8.10 | 12,680 | 2.90 | 2,130 | 2.13 | 1,404 | 1.53 | 630 | 0.59 | 693 |
| 26 | 7.50 | 10,500 | 7.90 | 11,930 | 2.90 | 2,130 | 2.09 | 1,372 | 1.46 | 622 | 0.42 | 695 |
| 27 | 7.35 | 9,990 | 7.35 | 10,050 | 2.75 | 1,970 | 2.14 | 1,412 | 1.56 | 620 | 0.37 | 665 |
| 28 | 7.50 | 10,500 | 7.35 | 10,050 | 2.65 | 1,870 | 2.29 | 1,532 | 1.53 | 623 | 0.32 | 618 |
| 29 | 7.35 | 9,990 | 7.30 | 9,900 | 2.50 | 1,720 | 2.34 | 1,576 | 1.61 | 636 | 0.32 | 520 |
| 30 | 7.70 | 11,200 | 7.65 | 11,020 | 2.45 | 1,675 | 2.39 | 1,621 | 1.91 | 644 | 1.97 | 422 |
| 31 | 7.75 | 11,380 | 7.55 | 10,680 | ..... | ..... | 2.44 | 1,666 | ..... | ..... | 2.71 | 450*d* |

*b* Open water March 30 to Nov. 2.
*d* Ice conditions Nov. 3 to Dec. 31.

MONTHLY DISCHARGE of Athabaska River at Jasper, for 1915.

(Drainage area 1,600 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 563 | 494 | 536 | 0.335 | 0.39 | 32,957 |
| February | 490 | 438 | 463 | 0.289 | 0.30 | 25,714 |
| March | 437 | 402 | 423 | 0.264 | 0.30 | 25,009 |
| April | 1,430 | 440 | 752 | 0.470 | 0.52 | 44,747 |
| May | 6,360 | 1,135 | 3,955 | 2.472 | 2.85 | 243,184 |
| June | 19,620 | 4,200 | 7,960 | 4.975 | 5.55 | 473,6[illegible] |
| July | 13,070 | 7,230 | 10,055 | 6.284 | 7.24 | 618,2[illegible] |
| August | 16,220 | 9,900 | 12,043 | 7.527 | 8.68 | 740,4[illegible] |
| September | 8,160 | 1,675 | 3,430 | 2.144 | 2.39 | 204,1[illegible] |
| October | 2,130 | 1,279 | 1,592 | 0.995 | 1.15 | 97,888 |
| November | 1,500 | 620 | 880 | 0.550 | 0.61 | 52,364 |
| December | 853 | 422 | 717 | 0.448 | 0.52 | 44,087 |
| The year | ..... | . | | | 30.50 | 2,6[illegible],4[illegible]3 |

### MALIGNE RIVER NEAR JASPER.

*Location.*—On the SW. ¼ Sec. 1, Tp. 46, Rge. 1, W. 6th Mer., about 4½ miles northeast of Jasper and about 400 feet from the point where the Maligne River enters the Athabaska River.

*Records available.*—Discharge measurements from June 29, 1914, to December 31, 1915. During 1915 gauge heights were obtained at irregular intervals only.

*Gauge.*—Vertical staff, on right bank of river about 250 feet upstream from cable support. Zero elevation of gauge maintained at 91.62 feet since establishment.

*Bench-mark.*—A six-inch spike driven in a 15-inch spruce stump, on right bank of the river, and about 4 feet north of the gauge. Assumed elevation 100.00 feet.

*Channel.*—One channel at all stages, fairly permanent.

*Discharge measurements.*—Made from a cable.

*Winter flow.*—Not affected by ice.

*Observer.*—A. M. Woods.

DISCHARGE MEASUREMENTS of Maligne River near Jasper, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Feb. 11 | R. J. McGuinness | 63 | 64 | 1.49 | 0 40 | 95 |
| Mar. 19 | J. M. Paul | 62 | 64 | 1.16 | 0.36 | 75 |
| April 28 | do | 67 | 86 | 1.69 | 0.83 | 146 |
| May 18 | do | 77 | 154 | 3.75 | 1.99 | 575 |
| June 4 | do | 82 | 203 | 5.22 | 2.70 | 1,075 |
| June 25 | do | 86 | 243 | 5.68 | 3.10 | 1,379 |
| July 13 | do | 87 | 250 | 6.36 | 3.55 | 1,584 |
| Aug. 2 | do | 87 | 269 | 6.22 | 3.26 | 1,670 |
| Aug. 18 | do | 86 | 247 | 6.16 | 3.22 | 1,522 |
| Sept. 2 | do | 86 | 248 | 6.39 | 3.25 | 1,584 |
| Sept. 23 | do | 79 | 182 | 4.50 | 2.41 | 818 |
| Oct. 7 | do | 74 | 132 | 3.09 | 1.74 | 408 |
| Oct. 27 | do | 72 | 120 | 2.91 | 1.57 | 349 |
| Dec. 15 | do | 67 | 86 | 1 67 | 0.70 | 144 |

### ROCKY RIVER NEAR HAWES.

*Location.*—On the NE.¼ Sec. 14, Tp. 48, Rge. 28, W. 5th Mer., about three-quarters of a mile east of Hawes station, and about 300 yards from the point where the Rocky River enters the Athabaska River.

*Records available.*—June 9, 1913, to December 31, 1915.

*Gauge.*—Vertical staff on right bank of river and under Grand Trunk Pacific Railway bridge; datum maintained at 3,273.81 feet since establishment.

*Bench-mark.*—On NW. corner of concrete pier and 10 feet from gauge. Elevation 3, 282.90 feet. (Grand Trunk Pacific Railway datum.)

*Discharge measurements.*—Made from a bridge.

*Winter flow.*—River affected by ice from November to April. Discharge measurements made at a point about one mile above station.

*Floods.*—Floods occurred from June 26 to 28. The observer was absent at this time so that no actual records are available. It is probable that the maximum gauge height was about 8.50 feet.

*Observer.*—C. Picarell, January 1 to February 6. G. E. Charlesworth, February 7 to September 21. T. Fortin, September 22 to October 7. F. E. Falch, October 11 to December 31.

DISCHARGE MEASUREMENTS of Rocky River at Hawes, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 21 | R. J. McGuinness | 200 | 102 | 0.16 | 6.43 | 16.60 |
| Feb. 9 | do | 200 | 84 | 0.08 | 6.85 | 6.35 |
| Mar. 13 | J. M. Paul | 36 | 33 | 3.32 | 5.16 | 108.00 |
| April 7 | do | 65 | 40 | 2.06 | 4.28 | 82.00 |
| April 29 | do | 28 | 33 | 3.77 | 4.50 | 126.00 |
| May 21 | do | 130 | 169 | 3.50 | 5.30 | 590.00 |
| June 7 | do | 165 | 251 | 4.68 | 5.47 | 1,176.00 |
| June 30 | do | 209 | 578 | 5.75 | 4.64 | 3,325.00 |
| July 17 | do | 150 | 286 | 6.42 | 3.93 | 1,836.00 |
| Aug. 4 | do | 119 | 232 | 5.49 | 2.89 | 1,274.00 |
| Aug. 21 | do | 119 | 227 | 5.20 | 3.04 | 1,178.00 |
| Sept. 6 | do | 100 | 138 | 4.01 | 2.26 | 554.00 |
| Sept. 25 | do | 94 | 130 | 3.66 | 2.12 | 476.00 |
| Oct. 11 | do | 91 | 103 | 3.23 | 1.85 | 333.00 |
| Oct. 30 | do | 91 | 106 | 3.11 | 1.80 | 330.00 |
| Nov. 24 | do | 129 | 140 | 1.26 | 2.40 | 177.00 |
| Dec. 9 | do | 69 | 123 | 0.38 | 3.42 | 47.00 |
| Dec. 10 | do | 45 | 89 | 0.81 | 2.27 | 72.00 |

DAILY GAUGE HEIGHT AND DISCHARGE of Rocky River at Hawes, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 6.88 | 107.0*a* | 7.65 | 12.00 | 6.23 | 63 | 5.29 | 100*a* | 4.58 | 143 | 5.42*d* | 924 |
| 2 | 6.94 | 108.0 | 7.69 | 11.50 | 5.97 | 66 | 5.01 | 98*b* | 4.62 | 153 | 5.44 | 1,008 |
| 3 | 7.02 | 107.0 | 7.57 | 11.40 | 6.08 | 71 | 4.88 | 96 | 4.64 | 158 | 5.45 | 1,050 |
| 4 | 6.78 | 107.0 | 7.57 | 11.30 | 6.22 | 80 | 4.68 | 95*b* | 4.66 | 164 | 5.55 | 1,650 |
| 5 | 6.27 | 106.0 | 7.52 | 10.20 | 6.27 | 88 | 4.37 | 93*c* | 4.72 | 180 | 5.62 | 2,070 |
| 6 | 5.80 | 104.0 | 7.30 | 9.00 | 5.85 | 94 | 4.29 | 77 | 4.88 | 232 | 5.65 | 2,250 |
| 7 | 5.73 | 95.0 | 7.25 | 7.90 | 5.90 | 98 | 4.27 | 74 | 5.01*d* | 294 | 5.47 | 1,170 |
| 8 | 6.99 | 81.0 | 7.03 | 7.00 | 6.10 | 102 | 4.24 | 69 | 5.14 | 380 | 5.45 | 1,050 |
| 9 | 7.14 | 76.0 | 7.06 | 6.35 | 5.83 | 104 | 4.25 | 71 | 5.24 | 488 | 5.38 | 782 |
| 10 | 7.19 | 75.0 | 7.05 | 7.90 | 5.92 | 106 | 4.22 | 66 | 5.31 | 611 | 5.36 | 724 |
| 11 | 7.09 | 74.0 | 6.98 | 9.50 | 5.88 | 107 | 4.26*d* | 73 | 5.21*d* | 452 | 5.34 | 674 |
| 12 | 7.02 | 74.0 | 6.88 | 11.00 | 5.02 | 108 | 4.29*d* | 77 | 5.11 | 356 | 5.42*d* | 924 |
| 13 | 6.85 | 72.0 | 6.63 | 11.80 | 5.35 | 108 | 4.32*d* | 83 | 5.08 | 336 | 5.50 | 1,350 |
| 14 | 5.98 | 70.0 | 6.57 | 13.00 | 5.16 | 108 | 4.35*d* | 89 | 5.02 | 300 | 5.20*d* | 440 |
| 15 | 5.89 | 68.0 | 6.41 | 14.80 | 5.56 | 108 | 4.38*d* | 96 | 4.96 | 267 | 4.90 | 240 |
| 16 | 6.21 | 66.0 | 6.84 | 18.00 | 5.25 | 108 | 4.41 | 102 | 4.91 | 244 | 5.00*d* | 288 |
| 17 | 7.02 | 60.0 | 7.15 | 20.00 | 5.24 | 107 | 4.39 | 98 | 4.94*d* | 258 | 5.11 | 356 |
| 18 | 7.20 | 53.0 | 6.77 | 25.00 | 5.49 | 107 | 4.47 | 116 | 4.97*d* | 272 | 4.90 | 240 |
| 19 | 7.23 | 42.0 | 7.08 | 31.00 | 5.55 | 106 | 4.53 | 130 | 4.99 | 283 | 4.70 | 174 |
| 20 | 7.02 | 30.0 | 5.86 | 40.00 | 5.51 | 106 | 4.51*d* | 125 | 5.01 | 294 | 4.55 | 135 |
| 21 | 6.57 | 16.6 | 5.82 | 44.00 | 6.08 | 106 | 4.48 | 118 | 5.25 | 500 | 4.60*d* | 148 |
| 22 | 6.15 | 14.9 | 5.73 | 48.00 | 6.04 | 107 | 4.46 | 113 | 5.21 | 452 | 4.66 | 164 |
| 23 | 6.42 | 14.8 | 6.12 | 50.00 | 6.07 | 107 | 4.47*d* | 116 | 5.24 | 488 | 4.69 | 171 |
| 24 | 6.72 | 14.0 | 6.32 | 52.00 | 5.18 | 106 | 4.49 | 121 | 5.29*d* | 572 | 4.68 | 169 |
| 25 | 7.27 | 13.7 | 6.26 | 56.00 | 4.99 | 106 | 4.51 | 125 | 5.34*d* | 674 | 4.82 | 210 |
| 26 | 6.85 | 13.4 | 6.53 | 58.00 | 5.22 | 106 | 4.50 | 123 | 5.38 | 782 | 5.90*d* | 3,080 |
| 27 | 5.95 | 13.0 | 6.58 | 60.00 | 5.07 | 105 | 4.50 | 123 | 5.32 | 632 | 7.00*d* | 5,934 |
| 28 | 5.72 | 13.0 | 6.54 | 61.00 | 5.01 | 104 | 4.49 | 121 | 5.32 | 632 | 6.20*d* | 4,962 |
| 29 | 5.67 | 12.8 | | | 5.51 | 103 | 4.49 | 121 | 5.32 | 632 | 5.40*d* | 3,970 |
| 30 | 6.21 | 12.5 | | | 5.53 | 102 | 4.55*d* | 135 | 5.36 | 724 | 4.60 | 2,978 |
| 31 | 6.76 | 12.1 | | | 5.55 | 101 | | | 5.39*d* | 811 | | |

*a* Ice conditions Jan. 1 to April 1.
*b* Ice breakup April 2 to 4; discharges estimated.
*c* Open water April 5 to Nov. 6.
*d* Gauge height interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of Rocky River at Hawes, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 4.51*d* | 2,866 | 2.90 | 1,050 | 2.35 | 613 | 2.04 | 433 | 1.75 | 298 | 3.20 | 86 |
| 2 | 4.42*d* | 2,755 | 2.90*d* | 1,050 | 2.30*d* | 581 | 2.01*d* | 417 | 1.75 | 298 | 4.00 | 85 |
| 3 | 4.33*d* | 2,643 | 2.89 | 1,041 | 2.26 | 556 | 1.98*d* | 402 | 1.70 | 276 | 3.50 | 81 |
| 4 | 4.23 | 2,519 | 2.89 | 1,041 | 2.26 | 556 | 1.96 | 393 | 1.67 | 263 | 3.45 | 78 |
| 5 | 4.18*d* | 2,457 | 2.78 | 944 | 2.26 | 556 | 1.85 | 342 | 1.66 | 258 | 3.38*d* | 74 |
| 6 | 4.14 | 2,408 | 2.70 | 876 | 2.26 | 556 | 1.82*d* | 329 | 1.66 | 258*c* | 3.30 | 73 |
| 7 | 4.16*d* | 2,432 | 2.68 | 860 | 2.25 | 550 | 1.80 | 320 | 1.65 | 258*b* | 3.35 | 72 |
| 8 | 4.18 | 2,457 | 2.66 | 843 | 2.25*d* | 550 | 1.82*d* | 329 | 1.65 | 257*a* | 3.25 | 72 |
| 9 | 4.14 | 2,408 | 2.62*d* | 811 | 2.25 | 550 | 1.84*d* | 338 | 1.65 | 255 | 3.45 | 73 |
| 10 | 4.14 | 2,408 | 2.58 | 779 | 2.26 | 556 | 1.85*d* | 342 | 1.62 | 246 | 3.48*d* | 72 |
| 11 | 3.98 | 2,216 | 2.56*d* | 764 | 2.26*d* | 556 | 1.85 | 342 | 1.63 | 238 | 3.50 | 72 |
| 12 | 4.05 | 2,300 | 2.54 | 748 | 2.26 | 556 | 1.85 | 342 | 1.75 | 227 | 3.90 | 70 |
| 13 | 4.11 | 2,372 | 2.52 | 733 | 2.21*d* | 527 | 1.82 | 329 | 1.80 | 221 | 4.10 | 68 |
| 14 | 4.10*d* | 2,360 | 2.50*d* | 717 | 2.16 | 499 | 1.78 | 311 | 2.05 | 216 | 3.60 | 67 |
| 15 | 4.10 | 2,360 | 2.47 | 695 | 2.13*d* | 482 | 1.76 | 302 | 2.20 | 211 | 3.10 | 67 |
| 16 | 4.10 | 2,360 | 2.47 | 695 | 2.10 | 465 | 1.76 | 302 | 2.35 | 208 | 3.30 | 63 |
| 17 | 3.93 | 2,155 | 2.46 | 688 | 2.10 | 465 | 1.76 | 302 | 2.30 | 207 | 3.25 | 61 |
| 18 | 3.92 | 2,144 | 2.90*d* | 1,050 | 2.18*d* | 510 | 1.79 | 316 | 2.25 | 206 | 3.20 | 61 |
| 19 | 3.91 | 2,132 | 3.34 | 1,487 | 2.26 | 556 | 1.82 | 329 | 2.25 | 205 | 3.25 | 60 |
| 20 | 3.90 | 2,120 | 3.26 | 1,402 | 2.26*d* | 556 | 1.79 | 316 | 2.25 | 202 | 3.28 | 60 |
| 21 | 3.78*d* | 1,981 | 3.00 | 1,144 | 2.25 | 550 | 1.78 | 311 | 2.25 | 200 | 3.75 | 59 |
| 22 | 3.66 | 1,842 | 2.86 | 1,015 | 2.24*d* | 544 | 1.76 | 302 | 2.45 | 195 | 3.50 | 56 |
| 23 | 3.52 | 1,682 | 2.78*d* | 944 | 2.22*d* | 533 | 1.75 | 298 | 2.35 | 188 | 3.25 | 54 |
| 24 | 3.42 | 1,574 | 2.69 | 868 | 2.21*d* | 527 | 1.75 | 298 | 2.50 | 177 | 3.25 | 47 |
| 25 | 3.34 | 1,487 | 2.64 | 827 | 2.20 | 521 | 1.78 | 311 | 2.45 | 162 | 2.85*d* | 43 |
| 26 | 3.20 | 1,340 | 2.65 | 835 | 2.15*d* | 493 | 1.78 | 311 | 2.50 | 150 | 2.45 | 38 |
| 27 | 3.16 | 1,300 | 2.64 | 827 | 2.10*d* | 465 | 1.80 | 320 | 2.55 | 133 | 1.50 | 30 |
| 28 | 3.11*d* | 1,250 | 2.54*d* | 748 | 2.06 | 443 | 1.86 | 347 | 3.00 | 110 | 1.60 | 26 |
| 29 | 3.06 | 1,202 | 2.45 | 681 | 2.05*d* | 438 | 1.84 | 338 | 4.30 | 95 | 1.50 | 23 |
| 30 | 3.00 | 1,144 | 2.44 | 674 | 2.05*d* | 438 | 1.80 | 320 | 3.45 | 87 | 1.40 | 20 |
| 31 | 2.95*d* | 1,097 | 2.40*d* | 646 | ..... | ..... | 1.78 | 311 | ..... | ..... | 1.50 | 17*a* |

*a* Ice conditions Nov. 8 to Dec. 31.
*b* Ice forming Nov. 7.
*c* Open water April 5 to Nov. 6.
*d* Gauge height interpolated.

MONTHLY DISCHARGE of Rocky River at Hawes, for 1915.

(Drainage area 428 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 108 | 12.10 | 56 | 0.131 | 0.15 | 3,443 |
| February | 61 | 6.35 | 26 | 0.061 | 0.06 | 1,444 |
| March | 108 | 63.00 | 100 | 0.234 | 0.27 | 6,149 |
| April | 135 | 66.00 | 101 | 0.236 | 0.26 | 6,010 |
| May | 811 | 143.00 | 412 | 0.963 | 1.11 | 25,333 |
| June | 5,954 | 135.00 | 1,310 | 3.061 | 3.41 | 77,950 |
| July | 2,866 | 1,097.00 | 2,057 | 4.806 | 5.54 | 126,480 |
| August | 1,487 | 646.00 | 887 | 2.072 | 2.39 | 54,540 |
| September | 613 | 438.00 | 525 | 1.227 | 1.37 | 31,240 |
| October | 433 | 298.00 | 332 | 0.776 | 0.89 | 20,414 |
| November | 298 | 87.00 | 210 | 0.491 | 0.55 | 12,496 |
| December | 86 | 17.00 | 59 | 0.138 | 0.16 | 3,628 |
| The year | ..... | ..... | ..... | ..... | 16.16 | 369,127 |

ATHABASKA RIVER NEAR HINTON.

*Location.*—In the SE.¼ Sec. 8, Tp. 51, Rge. 25, W. 5th Mer., about three miles west of the town of Hinton, and just below the mouth of Prairie Creek.

*Records available.*—Gauge heights and discharge measurements available from May 4, 1915, to December 31, 1915.

*Gauges.*—The summer gauge is a vertical staff on the left bank of the river and about 800 feet below the cable; datum maintained at 3,144.13 feet since establishment. The winter gauge is a vertical staff on the right bank of the river, just above the mouth of Happy Creek, and about three miles below the summer gauge; datum maintained at 86.55 feet since establishment.

*Bench-marks.*—For the summer gauge a permanent iron bench-mark is located on the left bank of the river and about 15 feet from the gauge; elevation 3,154.02 feet. (Grand Trunk Pacific Railway datum.) For the winter gauge a six-inch spike in a spruce stump on the right bank and about 50 feet upstream from the gauge; assumed elevation 100.00 feet

*Discharge measurements.*—Made from a cable.

*Winter flow.*—River affected by ice from November to April. Discharge measurements made about three miles below the station.

*Floods.*—Floods occurred from June 26 to 30. The river overflowed its right bank at the station but no damage was done. The maximum gauge height was 10.70 feet and the maximum discharge 40,100 second-feet.

*Observer.*—J. R. McNeely, May 4 to November 12. L. O. Hoff, November 13 to December 31.

DISCHARGE MEASUREMENTS of Athabaska River near Hinton, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 10 | J. M. Paul | 280 | 664 | 0.68 | .....*b* | 449 |
| May 5 | do | 253 | 1,390 | 2.00 | 1.29 | 2,773 |
| May 24 | do | 361 | 2,246 | 4.47 | 3 95 | 10,011 |
| June 11 | do | 363 | 2,280 | 4.69 | 3.98 | 10,699 |
| June 27 | do | 433 | 5,177 | 5.80 | 11.56 | 32,461*a* |
| July 3 | do | 378 | 3,282 | 6.60 | 6.42 | 21,649 |
| July 19 | do | 377 | 3,207 | 6.25 | 6.33 | 20,048 |
| Aug. 7 | do | 372 | 2,937 | 6.05 | 5.63 | 17,783 |
| Aug. 23 | do | 367 | 2,957 | 6.03 | 5.74 | 17,839 |
| Sept. 8 | do | 353 | 2,201 | 4.43 | 3.67 | 9,745 |
| Sept. 27 | do | 286 | 1,621 | 2.70 | 1.86 | 4,371 |
| Oct. 13 | do | 256 | 1,413 | 2.17 | 1.30 | 3,072 |
| Nov. 1 | do | 255 | 1,404 | 2.19 | 1.24 | 3,075 |
| Nov. 18 | do | 253 | 1,390 | 1.99 | 1 28 | 2,759*a* |
| Dec. 8 | do | 220 | 1,072 | 1.17 | 4 17 | 1,258 |

*a* Slope measurement.
*b* Gauge not established.

DAILY GAUGE HEIGHT AND DISCHARGE of Athabaska River near Hinton, for 1915.

| Day. | May. | | June. | | July. | | August. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 3.10 | 7,375 | 8.70 | 31,220 | 5.61 | 17,479 |
| 2 | ..... | ..... | 3.50 | 8,760 | 6.70 | 22,320 | 5.73 | 18,007 |
| 3 | ..... | ..... | 3.70 | 9,500 | 6.40 | 20,985 | 5.81 | 18,360 |
| 4 | 1.10 | 2,820 | 3.70 | 9,500 | 6.10 | 19,650 | 6.51 | 21,474 |
| 5 | 1.30 | 3,115 | 3.80 | 9,880 | 5.95 | 18,982 | 6.09 | 19,606 |
| 6 | 1.50 | 3,430 | 4.05 | 10,860 | 6.25 | 20,318 | 5.79 | 18,271 |
| 7 | 2.30 | 5,060 | 3.95 | 10,462 | 6.55 | 21,652 | 5.62 | 17,523 |
| 8 | 3.00 | 7,050 | 4.30 | 11,865 | 6.70 | 22,320 | 5.71 | 17,919 |
| 9 | 3.50 | 8,760 | 4.20 | 11,460 | 6.30 | 20,540 | 5.69 | 17,831 |
| 10 | 3.70 | 9,500 | 3.90 | 10,265 | 6.10 | 19,650 | 5.67 | 17,743 |
| 11 | 4.00 | 10,660 | 3.75 | 9,690 | 6.12 | 19,739 | 5.61 | 17,479 |
| 12 | 3.80 | 9,880 | 3.85 | 10,072 | 5.71 | 17,919 | 5.56 | 17,259 |
| 13 | 3.20 | 7,710 | 4.00 | 10,660 | 5.73 | 18,007 | 5.47 | 16,863 |
| 14 | 2.90 | 6,730 | 4.15 | 11,260 | 6.11 | 19,694 | 5.45 | 16,775 |
| 15 | 2.80 | 6,420 | 4.20 | 11,460 | 6.56 | 21,697 | 5.53 | 17,127 |
| 16 | 2.70 | 6,125 | 4.50 | 12,695 | 6.88 | 23,121 | 5.58 | 17,347 |
| 17 | 2.20 | 4,825 | 5.15 | 15,475 | 6.90 | 23,210 | 5.67 | 17,743 |
| 18 | 2.20 | 4,825 | 5.55 | 17,215 | 6.71 | 22,364 | 5.89 | 18,716 |
| 19 | 2.40 | 5,310 | 5.05 | 15,045 | 6.21 | 20,140 | 6 26 | 20,362 |
| 20 | 2.70 | 6,125 | 4.80 | 13,970 | 6.06 | 19,472 | 6.25 | 20,318 |
| 21 | 3.30 | 8,050 | 4.85 | 14,185 | 5.97 | 19,072 | .02 | 19,294 |
| 22 | 3.90 | 10,265 | 4.80 | 13,970 | 6.06 | 19,472 | 5.90 | 18,760 |
| 23 | 4.10 | 11,060 | 4.95 | 14,615 | 6.12 | 19,739 | 5.74 | 18,051 |
| 24 | 3.90 | 10,265 | 5.20 | 15,690 | 5.91 | 18,804 | 5.70 | 17,875 |
| 25 | 3.90 | 10,265 | 5.45 | 16,775 | 5.70 | 17,875 | 5.67 | 17,743 |
| 26 | 3.80 | 9,880 | 7.55 | 26,102 | 5.61 | 17,479 | 5.63 | 17,567 |
| 27 | 3.70 | 9,500 | 10.58 | 39,586 | 5.54 | 17,171 | 5.35 | 16,338 |
| 28 | 3.50 | 8,760 | 10.70 | 40,120 | 5.43 | 16,687 | 5.14 | 15,432 |
| 29 | 3.50 | 8,760 | 10.04 | 37,183 | 5.40 | 16,555 | 5.06 | 15,088 |
| 30 | 3.40 | 8,400 | 9.58 | 35,136 | 5 50 | 16,995 | 5.31 | 16,164 |
| 31 | 3.30 | 8,050 | ..... | ..... | 5.53 | 17,127 | 5.35 | 16,338 |

DAILY GAUGE HEIGHT AND DISCHARGE of Athabaska River near Hinton, for 1915.—*Concluded.*

| Day. | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 5.01 | 14,873 | 1.74 | 3,856 | 1.27 | 3,070 | 3.70 | 1,810 |
| 2 | 4.44 | 12,443 | 1.78 | 3,932 | 1.14 | 2,878 | 3.89 | 1,740 |
| 3 | 4.28 | 11,784 | 1.82 | 4,010 | 1.08 | 2,792 | 4.04 | 1,640 |
| 4 | 4.20 | 11,460 | 1.77 | 3,913 | 1.01 | 2,694 | 4.16 | 1,525 |
| 5 | 4.30 | 11,865 | 1.70 | 3,780 | 0.91 | 2,558 | 4.22 | 1,430 |
| 6 | 4.32 | 11,947 | 1.62 | 3,636 | 0.83 | 2,450 | 4.33 | 1,340 |
| 7 | 4.14 | 11,220 | 1.50 | 3,430 | 0.81 | 2,424 | 4.19 | 1,280 |
| 8 | 3.60 | 9,125 | 1.50 | 3,430 | 0.73 | 2,319 | 4.17 | 1,260 |
| 9 | 3.49 | 8,724 | 1.48 | 3,398 | 0.70 | 2,280 | 4.30 | 1,225 |
| 10 | 3.01 | 7,082 | 1.44 | 3,334 | 0.67 | 2,244 | 4.42 | 1,200 |
| 11 | 2.96 | 6,922 | 1.30 | 3,115 | 0.62 | 2,184 | 4.33 | 1,180 |
| 12 | 2.80 | 6,420 | 1.19 | 2,950 | 0.51 | 2,056 | 4.30 | 1,170 |
| 13 | 2.74 | 6,243 | 1.28 | 3,085 | 1.25 | 2,140*a* | 4.26 | 1,165 |
| 14 | 2.61 | 5,868 | 1.20 | 2,965 | 1.34 | 2,290 | 4.37 | 1,150 |
| 15 | 2.36 | 5,210 | 1.11 | 2,834 | 1.79 | 2,475 | 4.43 | 1,140 |
| 16 | 2.34 | 5,160 | 1.00 | 2,680 | 2.03 | 2,610 | 4.41 | 1,110 |
| 17 | 2.33 | 5,135 | 0.97 | 2,640 | 2.17 | 2,720 | 4.36 | 1,080 |
| 18 | 2.30 | 5,060 | 1.09 | 2,806 | 2.38 | 2,759 | 4.55 | 1,060 |
| 19 | 2.38 | 5,260 | 1.18 | 2,936 | 2.55 | 2,750 | 4.45 | 1,060 |
| 20 | 2.41 | 5,336 | 1.28 | 3,085 | 2.43 | 2,730 | 4.40 | 1,060 |
| 21 | 2.54 | 5,678 | 1.31 | 3,130 | 2.34 | 2,690 | 4.56 | 1,050 |
| 22 | 2.40 | 5,310 | 1.27 | 3,070 | 2.56 | 2,620 | 4.43 | 1,030 |
| 23 | 2.21 | 4,848 | 1.18 | 2,936 | 2.75 | 2,530 | 4.57 | 1,010 |
| 24 | 2.15 | 4,712 | 1.11 | 2,834 | 2.91 | 2,325 | 4.34 | 990 |
| 25 | 2.11 | 4,622 | 1.09 | 2,806 | 3.09 | 2,050 | 4.39 | 970 |
| 26 | 2.18 | 4,780 | 1.05 | 2,750 | 3.01 | 1,975 | 4.32 | 970 |
| 27 | 1.86 | 4,090 | 1.09 | 2,806 | 3.07 | 1,940 | 4.27 | 970 |
| 28 | 1.79 | 3,951 | 1.13 | 2,864 | 3.19 | 1,920 | 4.08 | 970 |
| 29 | 1.74 | 3,856 | 1.27 | 3,070 | 3.17 | 1,900 | 4.08 | 950 |
| 30 | 1.72 | 3,818 | 1.30 | 3,115 | 3.32 | 1,860 | 3.72 | 930 |
| 31 | ..... | ..... | 1.19 | 2,950 | ..... | ..... | 3.60 | 900*a* |

*a* to *a* Ice conditions Nov. 13 to Dec. 31.

MONTHLY DISCHARGE of Athabaska River near Hinton, for 1915.

(Drainage area 4,140 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| May (4-31) | 11,060 | 2,820 | 7,557 | 1.825 | 1.90 | 419,695 |
| June | 40,120 | 7,375 | 16,028 | 3.871 | 4.32 | 953,732 |
| July | 31,220 | 16,555 | 19,999 | 4.831 | 5.57 | 1,229,690 |
| August | 21,474 | 15,088 | 17,834 | 4.308 | 4.97 | 1,096,570 |
| September | 14,873 | 3,818 | 7,093 | 1.713 | 1.91 | 422,063 |
| October | 4,010 | 2,640 | 3,166 | 0.765 | 0.88 | 194,670 |
| November | 3,070 | 1,860 | 2,408 | 0.582 | 0.65 | 143,286 |
| December | 1,810 | 900 | 1,173 | 0.283 | 0.33 | 72,125 |
| The period | | | | | 20.53 | 4,531,831 |

MCLEOD RIVER NEAR THORNTON.

*Location.*—On the NW.¼ Sec. 3, Tp. 54, Rge. 16, W. 5th Mer., at the Thornton ferry, about one mile downstream from the mouth of Wolf Creek, and about 200 feet south of E. Smith's ranch buildings.

*Records available.*—Gauge heights available from May 18, 1914, to December 31, 1915. Discharge measurements available from September 26, 1913, to December 31, 1915.

*Gauge.*—Vertical staff for high water and slope gauge for low water, directly under the ferry cable, on the right bank of the river. Datum maintained at 2,737.64 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark on the right bank and about 50 feet upstream from gauge. Elevation 2,749.16 feet. (Grand Trunk Pacific Railway datum.)

*Channel.*—One channel at all stages, fairly permanent.

*Discharge measurements.*—Made from a cable car and by wading.

*Winter flow.*—Stream affected by ice from November to April. Discharge measurements are made at a point about 1000 feet above regular station.

*Floods.*—Floods occurred from June 27 to 29, the maximum gauge height being 14.13 feet. The river did not overflow its banks at the station. The maximum discharge was 23,850 second-feet..

*Observer.*—Edward Smith.

DISCHARGE MEASUREMENTS of McLeod River near Thornton, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 14 | R. J. McGuinness | 120 | 118.0 | 0.83 | 1.46 | 98 |
| Feb. 3 | do | 100 | 96.5 | 1.14 | 1.51 | 110 |
| Mar. 9 | J. M. Paul | 68 | 62.0 | 1.32 | 1.59 | 82 |
| April 5 | do | 197 | 547.5 | 0.72 | 2.40 | 394 |
| April 21 | do | 273 | 508.8 | 1.39 | 1.70 | 709 |
| May 7 | do | 285 | 620.2 | 1.76 | 2.10 | 1,093 |
| May 27 | do | 307 | 856.6 | 2.23 | 3.02 | 1,916 |
| June 12 | do | 367 | 2,041.0 | 4.04 | 6.02 | 8,255 |
| June 27 | do | 420 | 5,096.0 | 4.70 | 14.13 | 23,850 |
| July 5 | do | 345 | 1,409.0 | 3.03 | 4.61 | 4,282 |
| July 22 | do | 365 | 2,193.4 | 4.28 | 6.53 | 9,389 |
| Aug. 9 | do | 306 | 813.0 | 1.95 | 2.80 | 1,586 |
| Aug. 25 | do | 309 | 846.4 | 1.99 | 2.91 | 1,684 |
| Sept. 14 | do | 285 | 585.0 | 1.64 | 2.08 | 958 |
| Sept. 29 | do | 287 | 644.6 | 1.55 | 2.16 | 1,028 |
| Oct. 19 | do | 282 | 581.6 | 1.54 | 2.02 | 895 |
| Nov. 5 | do | 273 | 513.8 | 1.22 | 1.84 | 627 |
| Nov. 16 | do | 275 | 566.0 | 0.90 | 2.01 | 509 |
| Dec. 4 | do | 136 | 267.0 | 0.63 | 1.64 | 168 |
| Dec. 29 | R. J. McGuinness | 120 | 215.0 | 0.79 | 2.04 | 169 |

DAILY GAUGE HEIGHT AND DISCHARGE of McLeod River near Thornton, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.10 | 130*a* | 1.52 | 108 | 1.48 | 109 | 2.13 | 261 | 1.50 | 560 | 3.10 | 1,930 |
| 2 | 1.11 | 140 | 1.52 | 108 | 1.48 | 112 | 2.13 | 293 | 1.60 | 620 | 3.20 | 2,050 |
| 3 | 1.12 | 149 | 1.52 | 110 | 1.48 | 100 | 2.12 | 326 | 1.60 | 620 | 4.50 | 4,040 |
| 4 | 1.23 | 150 | 1.52 | 119 | 1.48 | 86 | 2.11 | 359 | 1.80 | 760 | 4.80 | 4,620 |
| 5 | 1.24 | 149 | 1.52 | 128 | 1.58 | 82 | 2.40 | 394 | 2.30 | 1,150 | 4.30 | 3,680 |
| 6 | 1.26 | 140 | 1.52 | 132 | 1.58 | 81 | 2.41 | 430 | 2.30 | 1,150 | 4.10 | 3,340 |
| 7 | 1.28 | 112 | 1.52 | 130 | 1.58 | 81 | 1.62 | 490 | 2.10 | 990 | 4.00 | 3,170 |
| 8 | 1.30 | 122 | 1.52 | 118 | 1.58 | 81 | 2.68 | 555 | 2.10 | 990 | 4.00 | 3,170 |
| 9 | 1.32 | 130 | 1.51 | 106 | 1.57 | 82 | 1.84 | 625 | 2.10 | 990 | 4.80 | 4,620 |
| 10 | 1.34 | 131 | 1.51 | 102 | 1.57 | 83 | 2.26 | 695*b* | 2.10 | 990 | 6.20 | 8,410 |
| 11 | 1.36 | 130 | 1.51 | 103 | 1.56 | 88 | 1.77 | 735 | 2.10 | 990 | 6.30 | 8,740 |
| 12 | 1.38 | 125 | 1.51 | 110 | 1.56 | 95 | 1.79 | 753 | 2.10 | 990 | 6.00 | 7,750 |
| 13 | 1.40 | 115 | 1.51 | 118 | 1.65 | 103 | 1.70 | 690 | 2.00 | 910 | 5.60 | 6,560 |
| 14 | 1.42 | 98 | 1.51 | 128 | 1.65 | 113 | 1.72 | 704 | 2.10 | 990 | 5.50 | 6,290 |
| 15 | 1.42 | 101 | 1.51 | 138 | 1.64 | 124 | 1.84 | 788 | 2.30 | 1,150 | 5.20 | 5,520 |
| 16 | 1.42 | 107 | 1.50 | 142 | 1.73 | 135 | 1.75 | 725 | 2.30 | 1,150 | 5.20 | 5,520 |
| 17 | 1.42 | 125 | 1.50 | 135 | 1.73 | 145 | 1.67 | 669 | 2.40 | 1,240 | 5.50 | 6,290 |
| 18 | 1.42 | 147 | 1.50 | 85 | 1.72 | 155 | 1.68 | 676 | 2.30 | 1,150 | 6.00 | 7,750 |
| 19 | 1.42 | 146 | 1.50 | 81 | 1.72 | 160 | 1.69 | 683 | 2.20 | 1,070 | 5.60 | 6,560 |
| 20 | 1.42 | 135 | 1.50 | 90 | 1.71 | 162 | 1.69 | 683 | 2.10 | 990 | 5.10 | 5,280 |
| 21 | 1.52 | 123 | 1.50 | 93 | 1.80 | 163 | 1.70 | 690 | 2.00 | 910 | 4.90 | 4,830 |
| 22 | 1.52 | 114 | 1.50 | 95 | 1.90 | 162 | 1.50 | 560 | 2.00 | 910 | 4.50 | 4,040 |
| 23 | 1.52 | 110 | 1.49 | 96 | 2.09 | 160 | 1.40 | 500 | 2.20 | 1,070 | 4.30 | 3,680 |
| 24 | 1.52 | 109 | 1.49 | 96 | 2.19 | 151 | 1.30 | 440 | 2.40 | 1,240 | 4.10 | 3,340 |
| 25 | 1.52 | 108 | 1.49 | 90 | 2.18 | 142 | 1.30 | 440 | 2.80 | 1,610 | 4.10 | 3,340 |
| 26 | 1.52 | 107 | 1.49 | 82 | 2.27 | 143 | 1.40 | 500 | 2.80 | 1,610 | 5.90 | 7,430 |
| 27 | 1.52 | 107 | 1.49 | 84 | 2.27 | 151 | 1.40 | 500 | 3.00 | 1,820 | 13.86 | 33,688 |
| 28 | 1.52 | 107 | 1.49 | 98 | 2.26 | 167 | 1.40 | 500 | 2.80 | 1,610 | 11.40 | 25,570 |
| 29 | 1.52 | 107 | ..... | ..... | 2.26 | 185 | 1.40 | 500 | 2.70 | 1,510 | 7.90 | 14,020 |
| 30 | 1.52 | 106 | ..... | ..... | 2.15 | 210 | 1.40 | 500 | 2.70 | 1,510 | 6.90 | 10,720 |
| 31 | 1.52 | 107 | ..... | ..... | 2.14 | 235 | ..... | ..... | 3.00 | 1,820 | ..... | ..... |

*a* to *b* Ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of McLeod River near Thornton, for 1915.—*Concluded.*

| DAY. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 6.40 | 9,070 | 3.70 | 2,710 | 2.30 | 1,150 | 2.20 | 1,070 | 1.80 | 760*a* | 1.70 | 200 |
| 2 | 5.90 | 7,430 | 3.50 | 2,430 | 2.20 | 1,070 | 2.30 | 1,150 | 1.50 | 550 | 1.70 | 182 |
| 3 | 5.20 | 5,520 | 3.40 | 2,300 | 2.10 | 990 | 2.40 | 1,240 | 1.30 | 390 | 1.70 | 171 |
| 4 | 4.70 | 4,420 | 3.30 | 2,170 | 2.00 | 910 | 2.70 | 1,510 | 1.80 | 680 | 1.70 | 168 |
| 5 | 4.60 | 4,230 | 3.20 | 2,050 | 2.00 | 910 | 2.70 | 1,510 | 1.80 | 627 | 1.70 | 168 |
| 6 | 4.50 | 4,040 | 3.10 | 1,930 | 1.90 | 830 | 2.60 | 1,420 | 1.80 | 610 | 1.72 | 168 |
| 7 | 4.30 | 3,680 | 3.00 | 1,820 | 1.90 | 830 | 2.50 | 1,330 | 1.50 | 584 | 1.72 | 168 |
| 8 | 4.50 | 4,040 | 2.90 | 1,710 | 1.90 | 830 | 2.40 | 1,240 | 1.40 | 541 | 1.72 | 168 |
| 9 | 4.30 | 3,680 | 2.80 | 1,610 | 1.90 | 830 | 2.40 | 1,240 | 1.20 | 500 | 1.82 | 168 |
| 10 | 4.50 | 4,040 | 2.80 | 1,610 | 1.90 | 830 | 2.30 | 1,150 | 0.80 | 478 | 1.82 | 168 |
| 11 | 8.50 | 16,000 | 2.70 | 1,510 | 1.90 | 830 | 2.30 | 1,150 | 1.00 | 470 | 1.84 | 168 |
| 12 | 8.40 | 15,670 | 2.60 | 1,420 | 2.00 | 910 | 2.30 | 1,150 | 1.20 | 470 | 1.84 | 168 |
| 13 | 7.60 | 13,030 | 2.50 | 1,330 | 2.10 | 990 | 2.20 | 1,070 | 1.20 | 475 | 1.84 | 168 |
| 14 | 7.40 | 12,370 | 2.40 | 1,240 | 2.10 | 990 | 2.20 | 1,070 | 1.40 | 483 | 1.94 | 168 |
| 15 | 11.90 | 27,220 | 2.40 | 1,240 | 2.10 | 990 | 2.10 | 990 | 1.80 | 496 | 1.94 | 168 |
| 16 | 11.00 | 24,250 | 2.40 | 1,240 | 2.20 | 1,070 | 2.10 | 990 | 2.00 | 509 | 1.96 | 168 |
| 17 | 11.35 | 25,405 | 2.30 | 1,150 | 2.40 | 1,240 | 2.00 | 910 | 2.10 | 520 | 1.96 | 169 |
| 18 | 10.30 | 21,940 | 2.30 | 1,150 | 2.40 | 1,240 | 2.00 | 910 | 2.20 | 526 | 1.96 | 169 |
| 19 | 8.50 | 16,000 | 3.00 | 1,820 | 2.40 | 1,240 | 2.00 | 910 | 2.10 | 526 | 1.96 | 169 |
| 20 | 7.60 | 13,030 | 4.60 | 4,230 | 2.50 | 1,330 | 2.00 | 910 | 2.10 | 520 | 1.96 | 169 |
| 21 | 6.90 | 10,720 | 4.20 | 3,510 | 2.60 | 1,420 | 2.00 | 910 | 2.10 | 495 | 1.98 | 169 |
| 22 | 6.50 | 9,400 | 3.70 | 2,710 | 2.50 | 1,330 | 2.00 | 910 | 2.10 | 490 | 1.98 | 169 |
| 23 | 6.30 | 8,740 | 3.30 | 2,170 | 2.40 | 1,240 | 2.00 | 910 | 2.00 | 492 | 1.98 | 169 |
| 24 | 6.10 | 8,080 | 3.10 | 1,930 | 2.40 | 1,240 | 2.00 | 910 | 2.00 | 490 | 1.98 | 169 |
| 25 | 5.60 | 6,560 | 2.90 | 1,710 | 2.30 | 1,150 | 2.00 | 910 | 2.00 | 471 | 1.98 | 169 |
| 26 | 5.10 | 5,280 | 2.80 | 1,610 | 2.30 | 1,150 | 2.00 | 910 | 1.90 | 433 | 2.00 | 169 |
| 27 | 4.70 | 4,420 | 2.70 | 1,510 | 2.30 | 1,150 | 1.90 | 830 | 1.90 | 380 | 2.00 | 169 |
| 28 | 4.40 | 3,860 | 2.60 | 1,420 | 2.20 | 1,070 | 1.90 | 830 | 1.90 | 305 | 2.00 | 169 |
| 29 | 4.10 | 3,340 | 2.50 | 1,330 | 2.20 | 1,070 | 1.90 | 830 | 1.80 | 260 | 2.00 | 169 |
| 30 | 3.90 | 3,010 | 2.50 | 1,330 | 2.20 | 1,070 | 1.90 | 830 | 1.80 | 225 | 2.00 | 165 |
| 31 | 3.80 | 2,860 | 2.40 | 1,240 | ..... | ..... | 1.90 | 830 | ..... | ..... | 2.00 | 162*b* |

*a* to *b* Ice conditions.

MONTHLY DISCHARGE of McLeod River near Thornton, for 1915.

(Drainage area 2,507 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 150 | 98 | 122 | 0.049 | 0.06 | 7,501 |
| February | 142 | 81 | 108 | 0.043 | 0.04 | 5,998 |
| March | 235 | 81 | 131 | 0.052 | 0.06 | 8,055 |
| April | 788 | 261 | 556 | 0.222 | 0.25 | 33,084 |
| May | 1,820 | 560 | 1,131 | 0.451 | 0.52 | 69,542 |
| June | 33,688 | 1,930 | 7,198 | 2.871 | 3.20 | 428,306 |
| July | 27,220 | 2,860 | 9,720 | 3.877 | 4.47 | 597,660 |
| August | 4,230 | 1,150 | 1,843 | 0.735 | 0.85 | 113,324 |
| September | 1,420 | 830 | 1,063 | 0.424 | 0.47 | 63,252 |
| October | 1,510 | 830 | 1,050 | 0.419 | 0.48 | 64,560 |
| November | 760 | 225 | 492 | 0.196 | 0.22 | 29,276 |
| December | 200 | 162 | 170 | 0.068 | 0.08 | 10,453 |
| The year | ..... | ..... | ..... | ..... | 10.18 | 1,431,011 |

LOBSTICK RIVER NEAR ENTWISTLE.

*Location.*—On the NE.¼ Sec. 30, Tp. 53, Rge. 7, W. 5th Mer., about 2½ miles northwest of the village of Entwistle.

*Records available.*—Gauge heights available from July 11, 1913, to December 31, 1915. Discharge measurements available from February 20, 1913, to December 31, 1915.

*Gauge.*—Vertical staff at right bank and spiked to downstream side of bridge; elevation of zero maintained at 2,366.19 since establishment.

*Bench-mark.*—Permanent iron bench-mark, on right bank of river and about 60 feet west of the gauge. Elevation 2,375.14 feet. (Grand Trunk Pacific railway datum.)

*Channel.*—Fairly permanent.

*Discharge measurements.*—Made from a bridge.

*Winter flow.*—River affected by ice from November to April and discharge measurements are made at a point about 700 feet downstream from regular section.

*Observer.*—Edward Reed.

DISCHARGE MEASUREMENTS of Lobstick River near Entwistle, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq.-ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 9 | P. H. Daniells | 45 | 52.5 | 1.49 | 1.80 | 78.0 |
| Feb. 2 | R. J. McGuinness | 33 | 25.7 | 0.93 | 1.04 | 24.0 |
| Mar. 6 | do | 15 | 7.5 | 1.02 | 0.88 | 7.6 |
| April 3 | J. M. Paul | 56 | 68.8 | 2.34 | 2.82 | 161.0 |
| April 20 | do | 47 | 66.6 | 1.10 | 1.37 | 73 0 |
| May 8 | do | 46 | 54.2 | 1.02 | 1.12 | 55.0 |
| May 28 | do | 48 | 35.4 | 1.40 | 1.04 | 49.0 |
| June 14 | do | 81 | 162.7 | 3.47 | 2.54 | 565.0 |
| July 6 | do | 82 | 86.4 | 2.07 | 1.70 | 178.0 |
| July 24 | do | 82 | 136.8 | 3.42 | 2.34 | 469.0 |
| Aug. 10 | do | 82 | 96.6 | 2.39 | 1 84 | 230.0 |
| Aug. 26 | do | 82 | 79.6 | 1.78 | 1.62 | 142.0 |
| Sept. 11 | do | 82 | 83.6 | 1.71 | 1.53 | 143.0 |
| Sept. 30 | do | 82 | 70.2 | 1.46 | 1.44 | 103.0 |
| Oct. 16 | do | 89 | 62.9 | 1.38 | 1.37 | 87.0 |
| Nov. 12 | T. H. Burt | 89 | 158.8 | 1.36 | 3.16 | 214.0 |
| Dec. 3 | J. M. Paul | 89 | 90.3 | 0.59 | 3.08 | 53 0 |
| Dec. 19 | do | 89 | 75.0 | 0.29 | 1.37 | 22.0 |

DAILY GAUGE HEIGHT AND DISCHARGE of Lobstick River near Entwistle, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.60 | 56 | 0.98*a* | 24 | 0.88 | 11 | 2.58 | 120 | 1.30 | 82 | 1.10 | 56 |
| 2 | 2.50 | 58 | 0.98 | 24 | 0.88 | 10 | 2.68 | 140 | 1.40 | 99 | 1.20 | 68 |
| 3 | 2.42*a* | 61 | 0.98 | 24 | 0.88 | 9 | 2.68 | 161 | 1.40 | 99 | 1.40 | 99 |
| 4 | 2.34*a* | 64 | 0.98 | 24 | 0.88 | 9 | 2.58 | 166 | 1.30 | 82 | 1.40 | 99 |
| 5 | 2.25*a* | 68 | 1.08 | 24 | 0.88 | 8 | 2.28 | 178 | 1.30 | 82 | 1.70 | 168 |
| 6 | 2.16*a* | 72 | 1.08 | 24 | 0.88 | 8 | 3.08 | 180 | 1.30 | 82 | 1.90 | 235 |
| 7 | 2.07*a* | 76 | 0.98 | 24 | 0.88 | 8 | 2.96*a* | 178 | 1.30 | 82 | 2.00 | 280 |
| 8 | 1.98*a* | 75 | 0.98 | 24 | 0.88 | 8 | 2.84*a* | 171 | 1.20 | 68 | 2.50 | 552 |
| 9 | 1.89*a* | 78 | 0.98 | 25 | 0.88 | 9 | 2.72*a* | 163 | 1.20 | 68 | 2.80 | 723 |
| 10 | 1.80 | 77 | 0.98 | 25 | 0.88 | 9 | 2.60*a* | 154 | 1.20 | 68 | 2.80 | 723 |
| 11 | 1.70 | 78 | 0 88 | 25 | 0.98 | 10 | 2.48*a* | 146 | 1.20 | 68 | 2 60 | 609 |
| 12 | 1.70 | 76 | 0.88 | 26 | 0.98 | 11 | 2.36*a* | 138 | 1.30 | 82 | 2.70 | 666 |
| 13 | 1.60 | 73 | 0.88 | 26 | 0.98 | 11 | 2.24*a* | 130 | 1.30 | 82 | 2.60 | 609 |
| 14 | 1.60 | 73 | 0.88 | 26 | 0.98 | 12 | 2.12*a* | 122 | 1.30 | 82 | 2.50 | 552 |
| 15 | 1.50 | 72 | 0.88 | 25 | 0.98 | 13 | 2.00*a* | 114 | 1.20 | 68 | 2.40 | 495 |
| 16 | 1.50 | 73 | 0.88 | 25 | 0 98 | 14 | 1.88*a* | 228 | 1.20 | 68 | 2.20 | 383 |
| 17 | 1.60 | 74 | 0.88 | 24 | 1.08 | 16 | 1.76*a* | 186 | 1.10 | 56 | 2.20 | 383 |
| 18 | 2.00 | 76 | 0.88 | 23 | 1.08 | 17 | 1.64*a* | 152 | 1.10 | 56 | 2.20 | 383 |
| 19 | 2.10 | 77 | 0.88 | 22 | 1.08 | 19 | 1.52*a* | 124 | 1.10 | 56 | 2.10 | 330 |
| 20 | 2.10 | 77 | 0 88 | 21 | 1.08 | 21 | 1.40 | 99 | 1.10 | 56 | 2.10 | 330 |
| 21 | 2.20 | 76 | 0.88 | 20 | 2.23*a* | 23 | 1.40 | 99 | 1.00 | 46 | 2.20 | 383 |
| 22 | 1.60 | 71 | 0.88 | 18 | 3.38*b* | 26 | 1.60 | 142 | 1.00 | 46 | 2.00 | 280 |
| 23 | 1.50 | 60 | 0.88 | 17 | 3.18 | 30 | 1.60 | 142 | 1.00 | 46 | 2 10 | 330 |
| 24 | 1.60 | 52 | 0.88 | 16 | 2.88 | 34 | 1.50 | 119 | 1.00 | 46 | 2.00 | 280 |
| 25 | 1.50 | 47 | 0.78 | 15 | 3.98 | 40 | 1.70 | 168 | 1.00 | 46 | 2.00 | 280 |
| 26 | 1.50 | 42 | 0.78 | 14 | 3.66*c* | 46 | 1.50 | 119 | 1.30 | 82 | 2.00 | 280 |
| 27 | 1.30 | 36 | 0.78 | 13 | 3.33*c* | 58 | 1.60 | 142 | 1 10 | 56 | 2.00 | 280 |
| 28 | 1.00 | 29 | 0.88 | 12 | 3.00*c* | 68 | 1 50 | 119 | 1.00 | 46 | 2.00 | 280 |
| 29 | 1 00 | 26 | ..... | ..... | 2.68 | 80 | 1.50 | 119 | 1.00 | 46 | 2.00 | 280 |
| 30 | 0.99*a* | 25 | ..... | ..... | 2.68 | 90 | 1.40 | 99 | 1.20 | 68 | 2.00 | 280 |
| 31 | 0.99*a* | 25 | ..... | ..... | 2.58 | 105 | ..... | ..... | 1.30 | 82 | ..... | ..... |

*a* Gauge height interpolated.
*b* Ice breaking up March 22.
*c* March 26 to 28, ice about gauge; gauge heights interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of Lobstick River near Entwistle, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.00 | 280 | 1.80 | 198 | 1.60 | 142 | 1.40 | 99 | 1.10 | 56 | 3.19 | 65 |
| 2 | 1.80 | 198 | 1.80 | 198 | 1.55 | 130 | 1.40 | 99 | 1.10 | 56 | 2.79 | 59 |
| 3 | 1.70 | 168 | 1.80 | 198 | 1.50 | 119 | 1.40 | 99 | 1.10 | 56 | 3.10 | 53 |
| 4 | 1.70 | 168 | 1.80 | 198 | 1.50 | 119 | 1.40 | 99 | 1.10 | 56 | 2.60 | 50 |
| 5 | 1.70 | 168 | 1.80 | 198 | 1.50 | 119 | 1.40 | 99 | 1.30 | 82 | 2.60 | 46 |
| 6 | 1.70 | 168 | 1.80 | 198 | 1.50 | 119 | 1.40 | 99 | 1.50 | 118 | 2.40 | 43 |
| 7 | 1.70 | 168 | 1.70 | 168 | 1.50 | 119 | 1.40 | 99 | 1.50 | 118 | 2.40 | 39 |
| 8 | 1.70 | 168 | 1.70 | 168 | 1.50 | 119 | 1.40 | 99 | 1.50 | 118 | 2.10 | 35 |
| 9 | 1.70 | 168 | 1.70 | 168 | 1.50 | 119 | 1.40 | 99 | 1.60 | 141 | 2.10 | 32 |
| 10 | 1.80 | 198 | 1.80 | 198 | 1.50 | 119 | 1.50 | 119 | 1.80 | 160*a* | 2.10 | 30 |
| 11 | 1.80 | 198 | 1.80 | 198 | 1.50 | 119 | 1.50 | 119 | 1.80 | 185 | 2.10 | 27 |
| 12 | 2.00 | 280 | 1.80 | 198 | 1.50 | 119 | 1.40 | 99 | 3.16 | 214 | 1.90 | 25 |
| 13 | 2.00 | 280 | 1.80 | 198 | 1.50 | 119 | 1.40 | 99 | 2.00 | 221 | 1.90 | 24 |
| 14 | 2.10 | 330 | 1.80 | 198 | 1.60 | 142 | 1.40 | 99 | 3.80 | 226 | 1.70 | 24 |
| 15 | 2.50 | 552 | 1.80 | 198 | 1.60 | 142 | 1.40 | 99 | 3.80 | 227 | 1.60 | 23 |
| 16 | 2.60 | 609 | 1.70 | 168 | 1.50 | 119 | 1.40 | 99 | 4.00 | 226 | 1.60 | 22 |
| 17 | 2.60 | 609 | 1.70 | 168 | 1.50 | 119 | 1.40 | 99 | 3.70 | 225 | 1.60 | 22 |
| 18 | 2.50 | 552 | 1.70 | 168 | 1.50 | 119 | 1.40 | 99 | 3.70 | 222 | 1.60 | 22 |
| 19 | 2.50 | 552 | 1.70 | 168 | 1.50 | 119 | 1.40 | 99 | 3.70 | 217 | 1.40 | 22 |
| 20 | 2.50 | 552 | 1.70 | 168 | 1.40 | 99 | 1.40 | 99 | 3.60 | 210 | 1.40 | 23 |
| 21 | 2.30 | 438 | 1.70 | 168 | 1.40 | 99 | 1.40 | 99 | 3.63 | 200 | 1.50 | 25 |
| 22 | 2.30 | 438 | 1.70 | 168 | 1.40 | 99 | 1.40 | 99 | 3.63 | 191 | 1.60 | 28 |
| 23 | 2.30 | 438 | 1.60 | 142 | 1.40 | 99 | 1.40 | 99 | 3.73 | 180 | 1.60 | 30 |
| 24 | 2.30 | 438 | 1.60 | 142 | 1.40 | 99 | 1.40 | 99 | 3.73 | 165 | 1.60 | 32 |
| 25 | 2.30 | 438 | 1.60 | 142 | 1.40 | 99 | 1.40 | 99 | 3.73 | 147 | 1.60 | 32 |
| 26 | 2.30 | 438 | 1.60 | 142 | 1.40 | 99 | 1.40 | 99 | 3.76 | 125 | 1.60 | 33 |
| 27 | 2.10 | 330 | 1.60 | 142 | 1.40 | 99 | 1.30 | 82 | 3.76 | 110 | 1.60 | 33 |
| 28 | 2.10 | 330 | 1.50 | 119 | 1.40 | 99 | 1.30 | 82 | 3.56 | 95 | 1.50 | 32 |
| 29 | 2.00 | 280 | 1.50 | 119 | 1.40 | 99 | 1.30 | 82 | 3.06 | 85 | 1.40 | 31 |
| 30 | 1.80 | 198 | 1.50 | 119 | 1.40 | 99 | 1.30 | 82 | 3.06 | 75 | 1.30 | 29 |
| 31 | 1.80 | 198 | 1.60 | 142 | ..... | ..... | 1.20 | 68 | ..... | ..... | 1.20 | 27*a* |

*a* to *a* Ice conditions Nov. 10 to Dec. 31.

MONTHLY DISCHARGE of Lobstick River near Entwistle, for 1915.

(Drainage area 718 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 78 | 25 | 62 | 0.0864 | 0.10 | 3,812 |
| February | 26 | 12 | 22 | 0.0306 | 0.03 | 1,222 |
| March | 105 | 8 | 27 | 0.0376 | 0.04 | 1,660 |
| April | 228 | 99 | 144 | 0.2000 | 0.22 | 8,569 |
| May | 99 | 46 | 68 | 0.0947 | 0.11 | 4,181 |
| June | 723 | 56 | 357 | 0.4960 | 0.55 | 21,243 |
| July | 609 | 168 | 333 | 0.4640 | 0.53 | 20,475 |
| August | 198 | 119 | 170 | 0.2370 | 0.27 | 10,452 |
| September | 142 | 99 | 114 | 0.1590 | 0.18 | 6,783 |
| October | 119 | 68 | 97 | 0.1350 | 0.16 | 5,964 |
| November | 227 | 56 | 150 | 0.2090 | 0.23 | 8,929 |
| December | 65 | 22 | 33 | 0.0460 | 0.05 | 2,029 |
| The year | .. | ... | . | | 2.47 | 95,416 |

PEMBINA RIVER NEAR ENTWISTLE.

*Location.*—On the SW.¼ Sec. 20, Tp. 53, Rge. 7, W. 5th Mer., directly under the Grand Trunk Pacific railway trestle about 1½ miles west of the Entwistle station.

*Records available.*—Gauge heights available from May 8, 1914, to December 31, 1915. Discharge measurements available from December 19, 1913, to December 31, 1915.

*Gauge.*—Vertical staff, spiked to pile about 20 feet downstream from the cable and 20 feet from the right bank. Datum maintained at 2,348.06 feet.

*Bench-mark.*—Permanent iron bench-mark on the right bank and 20 feet west of cable tower.

*Elevation.*—2,364.60 feet. (Grand Trunk Pacific railway datum.)

*Channel.*—One channel at all stages, fairly permanent.

*Discharge measurements.*—Made from a cable car.

*Winter flow.*—River affected by ice from November to April; discharge measurements made at a point about 1500 feet above regular station.

*Floods.*—Two floods occurred in 1915, one in June and a small one in July. On June 29 the maximum gauge height was 10.50 feet and the maximum discharge 10,763 second-feet. The second flood occurred on July 17 and carried away the pile on which the temporary bench-mark was placed. Neither flood did any damage.

*Observer.*—Fred. Williams, January 1 to September 30, 1915. Edward Reed, October 14 to December 31, 1915.

DISCHARGE MEASUREMENTS of Pembina River near Entwistle, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 9 | P. H. Daniells | 84 | 164.0 | 0.33 | 0.94 | 54.0 |
| Feb. 2 | R. J. McGuinness | 90 | 145.0 | 0.06 | 1.18 | 8.7 |
| Mar. 6 | do | 145 | 259.0 | 0.17 | 1.15 | 44.0 |
| April 3 | J. M. Paul | 150 | 255.5 | 1.64 | 1.88 | 420.0 |
| April 20 | do | 149 | 522.7 | 0.83 | 1.47 | 433.0 |
| May 8 | do | 153 | 574.6 | 0.91 | 1.60 | 526.0 |
| May 28 | do | 152 | 580.4 | 1.21 | 1.83 | 702.0 |
| June 14 | do | 176 | 1,271.0 | 4.11 | 5.35 | 5,204.0 |
| June 29 | do | 190 | 2,184.0 | 4.93 | 10.50 | 10,763.0 |
| July 6 | do | 166 | 884.0 | 2.55 | 3.50 | 2,255.0 |
| July 23 | do | 163 | 1,143.0 | 3.54 | 5.03 | 4,045.0 |
| Aug. 10 | P. M. Sauder and J. M. Paul | 156 | 634.0 | 1.26 | 1.95 | 798.0 |
| Aug. 26 | J. M. Paul | 155 | 588.8 | 1.14 | 1.74 | 671.0 |
| Sept. 11 | do | 152 | 505.0 | 0.71 | 1.16 | 358.0 |
| Sept. 30 | do | 152 | 539.0 | 0.75 | 1.26 | 404.0 |
| Oct. 16 | do | 152 | 533.5 | 0.85 | 1.40 | 453.0 |
| Nov. 15 | T. H. Burt | 145 | 453.5 | 0.26 | 1.60 | 117.0 |
| Dec. 3 | J. M. Paul | 91 | 180.0 | 0.45 | 1.34 | 81.0 |
| Dec. 19 | do | 81 | 177.0 | 0.47 | 1.45 | 84.0 |

DAILY GAUGE HEIGHT AND DISCHARGE of Pembina River near Entwistle, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 0.90 | 48*b* | 1.28 | 12 | 1.18 | 39 | 1.00 | 126*b* | 1.30 | 328 | 3.00 | 1,780 |
| 2 | 0.90 | 52 | 1.28 | 9 | 1.18 | 40 | 1.50 | 222*c* | 1.30 | 328 | 3.00 | 1,780 |
| 3 | 0.90 | 55 | 1.28 | 11 | 1.18 | 41 | 1.90 | 318 | 1.30 | 328 | 3.00 | 1,780 |
| 4 | 0.90 | 56 | 1.27 | 15 | 1.17 | 42 | 2.00 | 413 | 1.30 | 328 | 3.10 | 1,890 |
| 5 | 0.90 | 57 | 1.27 | 19 | 1.17 | 43 | 2.30 | 508 | 1.30 | 328 | 3.20 | 2,000 |
| 6 | 1.00 | 56 | 1.26 | 21 | 1.17 | 44 | 2.49 | 603 | 1.40 | 385 | 3.30 | 2,120 |
| 7 | 1.00 | 52 | 1.26 | 24 | 1.17 | 45 | 2.39 | 698 | 1.60 | 522 | 3.20 | 2,000 |
| 8 | 1.00 | 50 | 1.26 | 25 | 1.17 | 46 | 2.39 | 793 | 1.60 | 522 | 3.10 | 1,890 |
| 9 | 1.00 | 54 | 1.25 | 28 | 1.17 | 48 | 2.38 | 888 | 1.50 | 452 | 4.20 | 3,335 |
| 10 | 1.00 | 57 | 1.25 | 30 | 1.17 | 49 | 2.18 | 983 | 1.40 | 385 | 5.80 | 5,970 |
| 11 | 1.00 | 59 | 1.24 | 32 | 1.17 | 50 | 2.07 | 890 | 1.30 | 328 | 5.80 | 5,970 |
| 12 | 1.00 | 58 | 1.24 | 33 | 1.17 | 52 | 1.97 | 807 | 1.20 | 275 | 5.70 | 5,795 |
| 13 | 1.00 | 57 | 1.23 | 35 | 1.17 | 54 | 1.87 | 726 | 1.10 | 230 | 5.60 | 5,620 |
| 14 | 1.00 | 54 | 1.23 | 35 | 1.17 | 56 | 1.76 | 641 | 1.10 | 230 | 5.30 | 5,110 |
| 15 | 1.00 | 47 | 1.23 | 35 | 1.17 | 58 | 1.66 | 566 | 1.10 | 230 | 5.00 | 4,605 |
| 16 | 1.02 | 42 | 1.22 | 34 | 1.18 | 60 | 1.55 | 487 | 1.10 | 230 | 4.60 | 3,955 |
| 17 | 1.02 | 34 | 1.22 | 33 | 1.18 | 62 | 1.55 | 487 | 1.10 | 230 | 4.70 | 4,115 |
| 18 | 1.02 | 32 | 1.22 | 33 | 1.18 | 66 | 1.54 | 480 | 1.10 | 230 | 4.80 | 4,275 |
| 19 | 1.02 | 31 | 1.21 | 33 | 1.18 | 68 | 1.44 | 412 | 1.10 | 230 | 4.80 | 4,275 |
| 20 | 1.02 | 30 | 1.21 | 34 | 1.18 | 71 | 1.43 | 405 | 1.20 | 275 | 4.50 | 3,795 |
| 21 | 1.05 | 29 | 1.20 | 35 | 1.18 | 73 | 1.50 | 452 | 1.30 | 328 | 4.30 | 3,485 |
| 22 | 1.05 | 27 | 1.20 | 36 | 1.18 | 75 | 1.50 | 452 | 1.40 | 385 | 4.10 | 3,185 |
| 23 | 1.05 | 27 | 1.20 | 36 | 1.18 | 78 | 1.50 | 452 | 1.40 | 385 | 4.20 | 3,335 |
| 24 | 1.10 | 26 | 1.20 | 37 | 1.18 | 82 | 1.50 | 452 | 1.40 | 385 | 4.30 | 3,485 |
| 25 | 1.10 | 25 | 1.20 | 36 | 1.18 | 87 | 1.40 | 385 | 1.50 | 452 | 4.60 | 3,955 |
| 26 | 1.17 | 24 | 1.19 | 36 | 0.99 | 91 | 1.30 | 328 | 1.60 | 522 | 4.80 | 4,275 |
| 27 | 1.27 | 23 | 1.19*a* | 37 | 0.99 | 95 | 1.30 | 328 | 1.80 | 671 | 8.90 | 8,606 |
| 28 | 1.27 | 22 | 1.19 | 38 | 0.99 | 99 | 1.30 | 328 | 1.80 | 671 | 9.20 | 8,960 |
| 29 | 1.27 | 21 | ..... | ..... | 0.99 | 104 | 1.30 | 328 | 1.80 | 671 | 10.50 | 10,494 |
| 30 | 1.27 | 19 | ..... | ..... | 0.99 | 112 | 1.30 | 328 | 2.00 | 832 | 6.80 | 6,128 |
| 31 | 1.27 | 17 | ..... | ..... | 0.99 | 117 | ..... | ..... | 2.50 | 1,265 | ..... | ..... |

*a* Gauge height interpolated.
*b* to *b* Ice conditions Jan. 1 to April 1.
*c* to *c* Ice breaking up; discharge interpolated April 2 to 9.

DAILY GAUGE HEIGHT AND DISCHARGE of Pembina River near Entwistle, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 6.00 | 5,184 | 3.00 | 1,720 | 1.30 | 417 | 1.30 | 417 | 1.20 | 377 | 1.36 | 85 |
| 2 | 5.00 | 4,004 | 2.90 | 1,615 | 1.30 | 417 | 1.30 | 417 | 1.20 | 377 | 1.36 | 83 |
| 3 | 4.60 | 3,532 | 2.80 | 1,515 | 1.30 | 417 | 1.40 | 465 | 1.10 | 340 | 1.30 | 81 |
| 4 | 4.30 | 3,178 | 2.70 | 1,420 | 1.20 | 377 | 1.50 | 518 | 1.10 | 340 | 1.40 | 81 |
| 5 | 3.70 | 2,485 | 2.60 | 1,325 | 1.20 | 377 | 1.50 | 518 | 1.30 | 417 | 1.40 | 81 |
| 6 | 3.50 | 2,255 | 2.50 | 1,235 | 1.20 | 377 | 1.50 | 518 | 1.30 | 417 | 1.40 | 81 |
| 7 | 3.40 | 2,145 | 2.40 | 1,145 | 1.20 | 377 | 1.50 | 518 | 1.30 | 417 | 1.40 | 81 |
| 8 | 3.30 | 2,035 | 2.30 | 1,065 | 1.20 | 377 | 1.50 | 518 | 1.30 | 417 | 1.40 | 81 |
| 9 | 3.20 | 1,930 | 2.10 | 910 | 1.20 | 377 | 1.50 | 518 | 1.30 | 417 | 1.40 | 81 |
| 10 | 3.40 | 2,145 | 2.00 | 835 | 1.20 | 377 | 1.50 | 518 | 1.40 | 367*b* | 1.40 | 81 |
| 11 | 4.00 | 2,830 | 1.90 | 767 | 1.20 | 377 | 1.50*a* | 518 | 1.60 | 317 | 1.50 | 81 |
| 12 | 4.60 | 3,532 | 1.80 | 703 | 1.20 | 377 | 1.45*a* | 492 | 1.60 | 267 | 1.50 | 82 |
| 13 | 5.00 | 4,004 | 1.70 | 639 | 1.20 | 377 | 1.40*a* | 465 | 1.61 | 217 | 1.50 | 82 |
| 14 | 6.00 | 5,184 | 1.70 | 639 | 1.30 | 417 | 1.40 | 465 | 1.60 | 167*b* | 1.50 | 82 |
| 15 | 7.60 | 7,072 | 1.70 | 639 | 1.30 | 417 | 1.40 | 465 | 1.60 | 117*c* | 1.50 | 82 |
| 16 | 8.00 | 7,544 | 1.70 | 639 | 1.30 | 417 | 1.40 | 465 | 1.70 | 117 | 1.40 | 83 |
| 17 | 8.60 | 8,252 | 1.70 | 639 | 1.40 | 465 | 1.40 | 465 | 1.70 | 116 | 1.40 | 84 |
| 18 | 8.50 | 8,134 | 1.70 | 639 | 1.40 | 465 | 1.40 | 465 | 1.70 | 116 | 1.40 | 84 |
| 19 | 8.40 | 8,016 | 1.80 | 703 | 1.50 | 518 | 1.40 | 465 | 1.70 | 115 | 1.40 | 84 |
| 20 | 7.90 | 7,426 | 2.00 | 835 | 1.50 | 518 | 1.40 | 465 | 1.70 | 113 | 1.40 | 82 |
| 21 | 7.00 | 6,364 | 2.30 | 1,065 | 1.50 | 518 | 1.40 | 465 | 1.72 | 111 | 1.60 | 78 |
| 22 | 5.80 | 4,948 | 2.60 | 1,325 | 1.50 | 518 | 1.40 | 465 | 1.72 | 106 | 1.60 | 74 |
| 23 | 5.08 | 4,098 | 2.40 | 1,145 | 1.50 | 518 | 1.40 | 465 | 1.82 | 102 | 1.60 | 73 |
| 24 | 4.78 | 3,744 | 2.00 | 835 | 1.40 | 465 | 1.40 | 465 | 1.82 | 101 | 1.60 | 73 |
| 25 | 4.58 | 3,508 | 1.90 | 767 | 1.40 | 465 | 1.40 | 465 | 1.82 | 99 | 1.60 | 71 |
| 26 | 4.48 | 3,390 | 1.70 | 639 | 1.40 | 465 | 1.40 | 465 | 1.64 | 97 | 1.80 | 71 |
| 27 | 4.28 | 3,154 | 1.60 | 578 | 1.30 | 417 | 1.40 | 465 | 1.44 | 96 | 1.80 | 69 |
| 28 | 3.88 | 2,692 | 1.50 | 518 | 1.30 | 417 | 1.40 | 465 | 1.44 | 95 | 1.80 | 68 |
| 29 | 3.48 | 2,233 | 1.40 | 465 | 1.30 | 417 | 1.40 | 465 | 1.54 | 93 | 1.80 | 66 |
| 30 | 3.28 | 2,014 | 1.40 | 465 | 1.30 | 417 | 1.40 | 465 | 1.46 | 86 | 1.70 | 63 |
| 31 | 3.10 | 1,825 | 1.40 | 465 | ..... | ..... | 1.20 | 377 | ..... | ..... | 1.70 | 61*c* |

*a* Gauge heights interpolated.
*b* to *b* Ice forming; discharge interpolated Nov. 10 to 14.
*c* to *c* Ice conditions Nov. 10 to Dec. 31.

MONTHLY DISCHARGE of Pembina River near Entwistle, for 1915.

(Drainage area 1,858 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 59 | 17 | 40 | 0.022 | 0.02 | 2,460 |
| February | 38 | 9 | 29 | 0.016 | 0.02 | 1,611 |
| March | 117 | 39 | 66 | 0.036 | 0.04 | 4,058 |
| April | 983 | 126 | 510 | 0.274 | 0.31 | 30,347 |
| May | 1,265 | 230 | 418 | 0.225 | 0.26 | 25,702 |
| June | 10,494 | 1,780 | 4,266 | 2.300 | 2.57 | 253,845 |
| July | 8,252 | 1,825 | 4,157 | 2.237 | 2.58 | 255,604 |
| August | 1,720 | 465 | 900 | 0.484 | 0.56 | 55,339 |
| September | 518 | 377 | 428 | 0.230 | 0.26 | 25,468 |
| October | 518 | 377 | 474 | 0.255 | 0.29 | 29,145 |
| November | 417 | 86 | 218 | 0.117 | 0.13 | 12,972 |
| December | 85 | 61 | 78 | 0.042 | 0.05 | 4,796 |
| The year | ..... | ..... | ..... | ..... | 7.09 | 701,358 |

## SWAN RIVER NEAR KINUSO.

*Location.*—On the NE. ¼ Sec. 23, Tp. 73, Rge. 10, W. 5th Mer. on the Edmonton, Dunvegan and British Columbia Railway bridge, one-half mile east of Kinuso.

*Records available.*—May 19 to October 31, 1915.

*Gauge.*—Vertical staff; elevation of zero 85.58 feet.

*Bench-marks.*(1) Marked on pier. Assumed elevation 100.00 feet. (2) Spike driven in eight-inch cottonwood tree, 50 feet from left bank of river and 130 upstream from the bridge, assumed elevation 107.08 feet.

*Channels.*—Two channels at all times.

*Discharge measurements.*—Made from bridge.

*Winter flow.*—No winter measurements taken.

*Observer.*—D. P. Pierce.

### Discharge Measurements of Swan River near Kinuso, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 19 | P. H. Daniells | 129 | 560 | 0.82 | 3.52 | 464 |
| June 12 | do | 133 | 719 | 1.09 | 4.51 | 782 |
| July 2 | do | 124 | 493 | 0.65 | 3.15 | 318 |
| July 29 | do | 124 | 416 | 1.07 | 3.71 | 443 |
| Aug. 19 | do | 99 | 253 | 0.48 | 2.20 | 120 |
| Oct. 25 | do | 98 | 116 | 0.80 | 2.13 | 93 |

### Daily Gauge Height and Discharge of Swan River near Kinuso, for 1915.

| Day. | May. | | June. | | July. | | August. | | September. | | October | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 3.75 | 498 | 3.25 | 345 | 3.22 | 336 | 1.82 | 53 | 2.12 | 98 |
| 2 | ..... | ..... | 3.95 | 568 | 3.10 | 300 | 3.17 | 321 | 1.82 | 53 | 2.12 | 98 |
| 3 | ..... | ..... | 7.60 | 2,015 | 3.10 | 300 | 3.27 | 351 | 1.82 | 53 | 2.22 | 114 |
| 4 | ..... | ..... | 8.55 | 2,395 | 2.95 | 262 | 3.22 | 336 | 1.82 | 53 | 2.32 | 134 |
| 5 | ..... | ..... | 8.25 | 2,275 | 2.85 | 240 | 3.12 | 306 | 1.77 | 46 | 2.32 | 134 |
| 6 | ..... | ..... | 7.85 | 2,115 | 2.75 | 220 | 3.02 | 280 | 1.77 | 46 | 2.22 | 114 |
| 7 | ..... | ..... | 7.75 | 2,075 | 2.65 | 200 | 2.92 | 255 | 1.82 | 53 | 2.22 | 114 |
| 8 | ..... | ..... | 7.15 | 1,835 | 2.55 | 180 | 2.77 | 224 | 1.82 | 53 | 2.12 | 98 |
| 9 | ..... | ..... | 6.05 | 1,395 | 2.75 | 220 | 2.92 | 255 | 1.82 | 53 | 2.12 | 98 |
| 10 | ..... | ..... | 6.05 | 1,395 | 2.95 | 262 | 2.82 | 234 | 1.82 | 53 | 2.22 | 114 |
| 11 | ..... | ..... | 5.75 | 1,275 | 4.71 | 859 | 2.77 | 224 | 1.92 | 68 | 2.22 | 114 |
| 12 | ..... | ..... | 4.70 | 855 | 4.96 | 959 | 2.92 | 255 | 2.82 | 234 | 2.22 | 114 |
| 13 | ..... | ..... | 4.55 | 795 | 4.86 | 919 | 2.77 | 224 | 2.67 | 204 | 2.32 | 134 |
| 14 | ..... | ..... | 4.40 | 735 | 5.56 | 1,199 | 2.92 | 255 | 2.72 | 214 | 2.22 | 114 |
| 15 | ..... | ..... | 4.25 | 675 | 6.21 | 1,459 | 2.77 | 224 | 2.87 | 244 | 2.12 | 98 |
| 16 | ..... | ..... | 3.95 | 568 | 6.41 | 1,539 | 2.62 | 194 | 2.87 | 244 | 2.02 | 83 |
| 17 | ..... | ..... | 3.55 | 435 | 6.26 | 1,479 | 2.47 | 164 | 2.77 | 224 | 2.12 | 98 |
| 18 | ..... | ..... | 3.35 | 375 | 6.66 | 1,639 | 2.42 | 154 | 2.72 | 214 | 2.12 | 98 |
| 19 | 3.50 | 420 | 3.20 | 330 | 6.56 | 1,599 | 2.22 | 114 | 2.62 | 194 | 2.17 | 106 |
| 20 | 3.40 | 390 | 3.35 | 375 | 6.36 | 1,519 | 2.22 | 114 | 2.72 | 214 | 2.22 | 114 |
| 21 | 3.30 | 360 | 3.70 | 480 | 6.21 | 1,459 | 2.22 | 114 | 2.62 | 194 | 2.12 | 98 |
| 22 | 3.25 | 345 | 3.85 | 532 | 5.71 | 1,259 | 2.32 | 134 | 2.52 | 174 | 2.12 | 98 |
| 23 | 3.35 | 375 | 3.65 | 465 | 5.16 | 1,039 | 2.22 | 114 | 2.52 | 174 | 2.12 | 98 |
| 24 | 4.15 | 638 | 3.65 | 465 | 4.81 | 899 | 2.22 | 114 | 2.47 | 164 | 2.12 | 98 |
| 25 | 4.05 | 602 | 3.55 | 435 | 4.56 | 799 | 2.12 | 98 | 2.42 | 154 | 2.18 | 107 |
| 26 | 3.80 | 515 | 3.50 | 420 | 4.36 | 719 | 2.12 | 98 | 2.32 | 134 | 2.18 | 107 |
| 27 | 3.85 | 532 | 3.40 | 390 | 4.06 | 606 | 2.22 | 114 | 2.27 | 124 | 2.28 | 126 |
| 28 | 3.95 | 568 | 3.65 | 465 | 3.46 | 408 | 2.02 | 83 | 2.22 | 114 | 2.18 | 107 |
| 29 | 3.75 | 498 | 3.45 | 405 | 3.71 | 484 | 2.02 | 83 | 2.22 | 114 | 2.13 | 100 |
| 30 | 3.75 | 498 | 3.25 | 345 | 3.61 | 453 | 1.92 | 68 | 2.22 | 114 | 2.13 | 100 |
| 31 | 3.65 | 465 | ..... | ..... | 3.56 | 438 | 1.87 | 60 | ..... | ..... | 2.13 | 100 |

MONTHLY DISCHARGE of Swan River near Kinuso, for 1915.

(Drainage area 860 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| May (19-31) | 638 | 345 | 477 | 0.555 | 0.27 | 12,297 |
| June | 2,395 | 330 | 913 | 1.062 | 1.18 | 54,327 |
| July | 1,639 | 180 | 783 | 0.910 | 1.05 | 48,145 |
| August | 351 | 60 | 190 | 0.221 | 0.25 | 11,683 |
| September | 244 | 46 | 134 | 0.156 | 0.17 | 7,974 |
| October | 134 | 83 | 107 | 0.124 | 0.14 | 6,579 |
| The period | ..... | ..... | ..... | ..... | 3.06 | 141,005 |

LESSER SLAVE LAKE AT GROUARD.

*Location.*—On the SW. ¼ Sec. 19, Tp. 75, Rge. 14, W. 5th Mer., near Grouard post office in the province of Alberta.

*Established.*—September 23, 1914, by F. R. Burfield.

*Records available.*—Gauge heights taken at regular intervals of several days from September 23, 1914, to December 31, 1915.

*Gauge.*—Vertical staff. From date of establishment until January 22, 1916, located on a telegraph pole nearest to floating portion of bridge over Buffalo Bay on town side and maintained at zero elevation of 88.43 feet. On January 22, 1916, the gauge was moved into an artificial channel along the east shore inlet to Buffalo Bay and approximately 200 feet southeast of the bridge; new zero elevation 84.23 ft. All records have been reduced to this latter datum.

*Bench-mark.*—Spike at base of telegraph pole about 50 feet southeast of easterly end of bridge. Assumed elevation 96.33.

*Observer.*—Chas. Nash.

DAILY GAUGE HEIGHT, IN FEET, of Lesser Slave Lake at Grouard, for 1914.

| DAY. | Sept. | Oct. | Nov. | Dec. |
|---|---|---|---|---|
| 1 | ..... | ..... | ..... | ..... |
| 2 | ..... | ..... | ..... | 7.15 |
| 3 | ..... | 7.80 | ..... | ..... |
| 4 | ..... | 7.95 | 7.55 | ..... |
| 5 | ..... | ..... | ..... | 7.15 |
| 6 | ..... | ..... | ..... | ..... |
| 7 | ..... | 7.85 | 7.50 | ..... |
| 8 | ..... | ..... | ..... | ..... |
| 9 | ..... | ..... | 7.05 | 7.15 |
| 10 | ..... | 7.89 | ..... | ..... |
| 11 | ..... | ..... | 7.50 | ..... |
| 12 | ..... | ..... | ..... | 7.10 |
| 13 | ..... | ..... | ..... | ..... |
| 14 | ..... | 7.80 | 7.30 | ..... |
| 15 | ..... | ..... | ..... | ..... |
| 16 | ..... | ..... | ..... | 7.10 |
| 17 | ..... | 8.00 | ..... | ..... |
| 18 | ..... | ..... | 7.45 | ..... |
| 19 | ..... | ..... | ..... | 7.10 |
| 20 | ..... | ..... | ..... | ..... |
| 21 | ..... | 7.85 | 7.45 | ..... |
| 22 | ..... | ..... | ..... | ..... |
| 23 | 7.85 | ..... | ..... | 7.10 |
| 24 | ..... | 7.70 | ..... | ..... |
| 25 | ..... | ..... | 7.20 | ..... |
| 26 | 7.85 | ..... | ..... | 7.10 |
| 27 | ..... | ..... | ..... | ..... |
| 28 | ..... | 7.60 | 7.25 | ..... |
| 29 | ..... | ..... | ..... | ..... |
| 30 | 7.80 | ..... | ..... | 7.00 |
| 31 | ..... | 7.55 | ..... | ..... |

Daily Gauge Height, in Feet, of Lesser Slave Lake at Grouard, for 1915.

| Day. | Jan. | Feb. | March. | April. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | 6.55 | | | | 6.35 | | | 5.35 |
| 2 | 7.15 | | | | | 6.70 | | | | 5.95 | | |
| 3 | | 6.95 | 6.75 | 6.55 | | | 7.15 | | | | 5.35 | 5.23 |
| 4 | | | | | | | | 7.15 | | | | 5.35 |
| 5 | | | | | 6.80 | 6.85 | | | 6.30 | | | |
| 6 | 7.15 | 6.95 | 6.70 | | | | | | | 5.75 | | |
| 7 | | | | 6.75 | | | 7.15 | 7.10 | | | | |
| 8 | | | | | 6.80 | | | | 6.20 | | | 5.35 |
| 9 | 7.15 | | | | | 7.05 | | | | 5.75 | 5.35 | |
| 10 | | 6.90 | 6.65 | 6.75 | | | 7.15 | | | | | |
| 11 | | | | | | | | 7.85 | 6.05 | | | 5.15 |
| 12 | | | | | 6.80 | 7.00 | | | | | | |
| 13 | 7.15 | 6.85 | 6.75 | | | | | | | 5.70 | 5.40 | |
| 14 | | | | 6.75 | | | 7.20 | 7.85 | | | | |
| 15 | | | | | 7.15 | | | | 6.15 | | | 5.15 |
| 16 | 7.05 | | | | | 7.20 | | | | 5.60 | | |
| 17 | | 6.85 | 6.65 | 6.75 | | | 7.10 | | | | 5.50 | |
| 18 | | | | | | | | 7.75 | 6.05 | | | 5.15 |
| 19 | | | | | 6.75 | 7.15 | | | | | | |
| 20 | 7.15 | 6.80 | 6.60 | | | | | | | 5.65 | 5.45 | |
| 21 | | | | 6.75 | | | 7.10 | 7.65 | | | | |
| 22 | | | | | 6.75 | 7.15 | | | 6.05 | | | 5.20 |
| 23 | 7.15 | | | | | | | | | 5.75 | | |
| 24 | | 6.75 | 6.55 | 6.85 | | | 7.10 | | | | 5.35 | |
| 25 | | | | | | | | 7.70 | 6.10 | | | 5.20 |
| 26 | | | | | 6.75 | 7.15 | | | | | | |
| 27 | 7.05 | 6.75 | 6.55 | | | | | | | 5.55 | 5.35 | |
| 28 | | | | 6.50 | | | 7.15 | 7.55 | | | | |
| 29 | | | | | 6.75 | | | | 6.15 | | | 5.20 |
| 30 | 7.05 | | | | | 7.15 | | | | 5.55 | | |
| 31 | | | 6.55 | | | | 7.15 | | | | | |

LESSER SLAVE LAKE NEAR SAWRIDGE.

*Location.*—On SW. ¼ Sec. 15, Tp. 73, Rge. 6, W. 5th Mer., on a bay in Dog Island three miles northwest of Sawridge.

*Records available.*—Gauge heights May 21, 1915, to December 31, 1915.

*Gauge.*—Vertical staff; 40 feet west of Herman Nicolas landing pier on Dog Island. Zero elevation maintained at 94.10 feet from May 21, 1915, to November 22, 1915. On November 22, 1915, zero elevation was changed to 91.70 feet. All records have been reduced to this latter datum.

*Bench-mark.*—Six-inch spike in poplar tree 20 feet from edge of lake and 60 feet east of gauge. Assumed elevation 100.00 feet.

*Observer.*—Herman Nicolas.

*Remarks.*—This station was established on May 21, 1915, by P. H. Daniells.

DAILY GAUGE HEIGHT, IN FEET, of Lesser Slave Lake near Sawridge, for 1915.

| DAY. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|---|
| 1 | ..... | 4.30 | 4.60 | 4.40 | 4.05 | 3.65 | 3.10 | 3.20 |
| 2 | ..... | 4.35 | 4.50 | 4.45 | 4.00 | 3.55 | 3.00 | 3.10 |
| 3 | ..... | 4.40 | 4.45 | 4.45 | 3.95 | 3.45 | 2.40 | 3.10 |
| 4 | ..... | 4.40 | 4.40 | 4.65 | 4.05 | 3.60 | 2.40 | 2.90 |
| 5 | ..... | 4.45 | 4.40 | 4.50 | 3.95 | 3.80 | 3.20 | 2.70 |
| 6 | ..... | 4.40 | 4.55 | 4.35 | 3.90 | 3.50 | 3.00 | 2.70 |
| 7 | ..... | 4.35 | 4.45 | 4.45 | 4.00 | 3.15 | .....a | 2.60 |
| 8 | ..... | 4.55 | 4.90 | 4.45 | 3.90 | 3.30 | ..... | 2.60 |
| 9 | ..... | 4.45 | 4.40 | 4.35 | 3.80 | 3.55 | ..... | 2.80 |
| 10 | ..... | 4.55 | 4.55 | 4.40 | 3.95 | 3.35 | ..... | 2.80 |
| 11 | ..... | 4.45 | 4.60 | 4.40 | 3.75 | 3.40 | ..... | 2.80 |
| 12 | ..... | 4.55 | 4.50 | 4.50 | 3.75 | 3.40 | ..... | 2.80 |
| 13 | ..... | 4.70 | 4.50 | 4.45 | 3.65 | 3.15 | ..... | 2.70 |
| 14 | ..... | 4.70 | 4.50 | 4.35 | 3.50 | 3.20 | ..... | 2.90 |
| 15 | ..... | 4.60 | 4.45 | 4.40 | 3.55 | 3.25 | ..... | 2.90 |
| 16 | ..... | 4.50 | 4.50 | 4.25 | 3.65 | 3.15 | ..... | 2.90 |
| 17 | ..... | 4.50 | 4.60 | 4.30 | 3.65 | 3.20 | ..... | 2.60 |
| 18 | ..... | 4.55 | 4.50 | 4.35 | 3.65 | 3.20 | ..... | 2.50 |
| 19 | ..... | 4.50 | 4.50 | 4.35 | 3.70 | 3.15 | ..... | 2.50 |
| 20 | ..... | 4.70 | 4.55 | 4.30 | 3.70 | 3.10 | ..... | 2.60 |
| 21 | 4.30 | 4.50 | 4.60 | 4.30 | 3.65 | 2.40 | .....a | 2.60 |
| 22 | 4.25 | 4.65 | 4.60 | 4.20 | 3.70 | 3.15 | 3.60 | 2.50 |
| 23 | 4.25 | 4.60 | 4.60 | 4.15 | 3.50 | 3.10 | 3.70 | 2.50 |
| 24 | 4.20 | 4.60 | 4.60 | 4.10 | 3.55 | 3.25 | 3.50 | 2.50 |
| 25 | 4.15 | 4.55 | 4.60 | 4.05 | 3.50 | 3.05 | 3.30 | 2.40 |
| 26 | 4.25 | 4.50 | 4.60 | 4.00 | 3.45 | 3.00 | 3.50 | 2.60 |
| 27 | 4.25 | 4.55 | 4.65 | 4.05 | 3.60 | 3.10 | 3.40 | 2.60 |
| 28 | 4.25 | 4.55 | 4.55 | 3.95 | 3.55 | 3.20 | 3.20 | 2.60 |
| 29 | 4.45 | 4.80 | 4.60 | 3.90 | 3.50 | 3.15 | 3.20 | 2.60 |
| 30 | 4.20 | 4.70 | 4.50 | 3.90 | ..... | 3.15 | 3.20 | 2.70 |
| 31 | 4.20 | ..... | 4.50 | 4.45 | ..... | 2.40 | ..... | 2.70 |

*a* No readings taken Nov 7 to 21.

## LESSER SLAVE RIVER AT SAWRIDGE.

*Location.*—On the SE. ¼ Sec. 7, Tp. 73, Rge. 5, W. 5th Mer., at traffic bridge about 150 feet south of the Sawridge hotel.

*Records available.*—May 20, 1915, to December 31, 1915.

*Gauge.*—Vertical staff, spiked to upstream pile of fifth bent of bridge from left bank. Elevation of zero maintained at 90.16 feet since establishment.

*Bench-mark.*—Spike driven in outside pile of north abutment. Assumed elevation 100.00 feet.

*Channel.*—One channel at all stages, shifting.

*Discharge measurements.*—Made from bridge.

*Winter flow.*—River affected by ice from November to April.

*Observer.*—C. J. Schurter.

DISCHARGE MEASUREMENTS of Lesser Slave River at Sawridge, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 20 | P. H. Daniells | 178 | 1,124 | 1.67 | 4.40 | 1,877 |
| June 14 | do | 178 | 1,166 | 1.67 | 4.69 | 1,944 |
| July 5 | do | 177 | 1,164 | 1.68 | 4.45 | 1,950 |
| Aug 2 | do | 177 | 1,198 | 1.78 | 4.50 | 2,123 |
| Aug. 23 | do | 175 | 1,133 | 1.68 | 4.12 | 1,898 |
| Oct. 28 | do | 157 | 1,013 | 1.51 | 3.27 | 1,527 |
| Nov. 11 | I. R. Strome | 146 | 872 | 0.80 | 2.31 | 702 |
| Nov. 13 | do | 144 | 825 | 0.72 | 2.57 | 597 |
| Dec. 4 | do | 140 | 814 | 1.05 | 2.64 | 857 |
| Dec. 29 | C. M. O'Neil | 140 | 883 | 0.64 | 2.83 | 567 |

DAILY GAUGE HEIGHT AND DISCHARGE of Lesser Slave River at Sawridge, for 1915.

| Day. | May. | | June. | | July. | | August. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | | | 4.40 | 2,060 | 4.60 | 2,185 | 4.50 | 2,120 |
| 2 | | | 4.55 | 2,152 | 4.60 | 2,185 | 4.50 | 2,120 |
| 3 | | | 4.70 | 2,250 | 4.60 | 2,185 | 4.60 | 2,185 |
| 4 | | | 4.60 | 2,185 | 4.50 | 2,120 | 4.50 | 2,120 |
| 5 | | | 4.60 | 2,185 | 4.40 | 2,060 | 4.40 | 2,060 |
| 6 | | | 4.60 | 2,185 | 4.40 | 2,060 | 4.60 | 2,185 |
| 7 | | | 4.60 | 2,185 | 4.50 | 2,120 | 4.70 | 2,250 |
| 8 | | | 4.60 | 2,185 | 4.50 | 2,120 | 4.60 | 2,185 |
| 9 | | | 4.60 | 2,185 | 4.60 | 2,185 | 4.50 | 2,120 |
| 10 | | | 4.60 | 2,185 | 4.40 | 2,060 | 4.50 | 2,120 |
| 11 | | | 4.60 | 2,185 | 4.70 | 2,250 | 4.70 | 2,250 |
| 12 | | | 4.60 | 2,185 | 4.60 | 2,185 | 4.50 | 2,120 |
| 13 | | | 4.90 | 2,380 | 4.50 | 2,120 | 4.50 | 2,120 |
| 14 | | | 4.70 | 2,250 | 4.50 | 2,120 | 4.50 | 2,120 |
| 15 | | | 4.50 | 2,120 | 4.40 | 2,060 | 4.40 | 2,060 |
| 16 | | | 4.60 | 2,185 | 4.40 | 2,060 | 4.40 | 2,060 |
| 17 | | | 4.60 | 2,185 | 4.40 | 2,060 | 4.40 | 2,060 |
| 18 | | | 4.60 | 2,185 | 4.60 | 2,185 | 4.40 | 2,060 |
| 19 | | | 4.60 | 2,185 | 4.70 | 2,250 | 4.40 | 2,060 |
| 20 | 4.40 | 2,060 | 4.60 | 2,185 | 4.70 | 2,250 | 4.30 | 2,000 |
| 21 | 4.40 | 2,060 | 4.70 | 2,250 | 4.70 | 2,250 | 4.60 | 2,185 |
| 22 | 4.40 | 2,060 | 4.80 | 2,315 | 4.80 | 2,315 | 4.30 | 2,000 |
| 23 | 4.40 | 2,060 | 4.60 | 2,185 | 4.70 | 2,250 | 4.30 | 2,000 |
| 24 | 4.20 | 1,942 | 4.60 | 2,185 | 4.70 | 2,250 | 4.30 | 2,000 |
| 25 | 4.40 | 2,060 | 4.60 | 2,185 | 4.70 | 2,250 | 4.20 | 1,942 |
| 26 | 4.40 | 2,060 | 4.50 | 2,120 | 4.70 | 2,250 | 4.20 | 1,942 |
| 27 | 4.40 | 2,060 | 4.70 | 2,250 | 4.70 | 2,250 | 4.20 | 1,942 |
| 28 | 4.30 | 2,000 | 4.70 | 2,250 | 4.70 | 2,250 | 4.00 | 1,834 |
| 29 | 4.50 | 2,120 | 4.60 | 2,185 | 4.70 | 2,250 | 4.00 | 1,834 |
| 30 | 4.40 | 2,060 | 4.60 | 2,185 | 4.70 | 3,250 | 3.90 | 1,782 |
| 31 | 4.40 | 2,060 | ..... | ..... | 4.70 | 2,250 | 4.60 | 2,185 |

DAILY GAUGE HEIGHT AND DISCHARGE of Lesser Slave River at Sawridge, for 1915—*Concluded.*

| Day. | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| ..... | 4.00 | 1,834 | 3.50 | 1,608 | 3.10 | 1,474 | 2.70 | 820 |
| 2 | 4.00 | 1,834 | 3.50 | 1,608 | 3.20 | 1,504 | 2.60 | 840 |
| 3 | 4.00 | 1,834 | 3.40 | 1,572 | 3.10 | 1,474 | 2.60 | 850 |
| 4 | 4.00 | 1,834 | 3.50 | 1,608 | 3.30 | 1,536 | 2.70 | 857 |
| 5 | 3.90 | 1,782 | 3.80 | 1,734 | 3.00 | 1,444 | 2.70 | 855 |
| 6 | 4.00 | 1,834 | 3.50 | 1,608 | 3.00 | 1,444 | 2.80 | 835 |
| 7 | 3.90 | 1,782 | 3.30 | 1,536 | 3.00 | 1,444 | 2.80 | 800 |
| 8 | 4.50 | 2,120 | 3.30 | 1,536 | 3.00 | 1,444 | 2.80 | 760 |
| 9 | 4.00 | 1,834 | 3.10 | 1,474 | 2.90 | 1,418 | 2.80 | 720 |
| 10 | 4.60 | 2,185 | 3.30 | 1,536 | 3.00 | 1,060*a* | 2.80 | 680 |
| 11 | 4.90 | 2,380 | 3.60 | 1,648 | 2.40 | 702 | 2.80 | 655 |
| 12 | 3.80 | 1,734 | 3.20 | 1,504 | 2.70 | 650 | 2.80 | 620 |
| 13 | 3.80 | 1,734 | 3.10 | 1,474 | 2.50 | 600 | 2.80 | 580 |
| 14 | 4.10 | 1,886 | 3.10 | 1,474 | 2.70 | 610 | 2.80 | 590 |
| 15 | 3.50 | 1,608 | 3.10 | 1,474 | 2.70 | 620 | 2.70 | 600 |
| 16 | 3.60 | 1,648 | 3.10 | 1,474 | 2.90 | 630 | 2.70 | 605 |
| 17 | 4.20 | 1,942 | 3.30 | 1,536 | 2.60 | 640 | 2.70 | 615 |
| 18 | 3.70 | 1,688 | 3.50 | 1,608 | 2.80 | 660 | 2.70 | 620 |
| 19 | 3.80 | 1,734 | 3.20 | 1,504 | 2.90 | 670 | 2.70 | 630 |
| 20 | 3.70 | 1,688 | 3.20 | 1,504 | 2.90 | 680 | 2.70 | 635 |
| 21 | 3.60 | 1,648 | 2.90 | 1,418 | 2.90 | 700 | 2.80 | 640 |
| 22 | 3.60 | 1,648 | 3.10 | 1,474 | 3.00 | 710 | 2.80 | 630 |
| 23 | 3.70 | 1,688 | 3.10 | 1,474 | 2.80 | 720 | 2.70 | 620 |
| 24 | 3.60 | 1,648 | 3.10 | 1,474 | 2.80 | 740 | 2.70 | 610 |
| 25 | 3.60 | 1,648 | 2.90 | 1,418 | 2.80 | 750 | 2.70 | 605 |
| 26 | 3.40 | 1,572 | 2.90 | 1,418 | 2.80 | 760 | 2.70 | 595 |
| 27 | 3.40 | 1,572 | 3.00 | 1,444 | 2.70 | 770 | 2.70 | 585 |
| 28 | 3.40 | 1,572 | 3.10 | 1,474 | 2.70 | 790 | 3.00 | 580 |
| 29 | 3.10 | 1,474 | 3.30 | 1,536 | 2.70 | 800 | 2.80 | 570 |
| 30 | 3.80 | 1,734 | 3.20 | 1,504 | 2.70 | 810 | 2.70 | 570 |
| 31 | ..... | ..... | 3.20 | 1,504 | ..... | ..... | 2.70 | 565*a* |

*a* to *a* Ice conditions.

MONTHLY DISCHARGE of Lesser Slave River at Sawridge, for 1915.

(Drainage area 6,520 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| May (20–31) | 2,060 | 1,942 | 2,050 | 0.314 | 0.14 | 48,782 |
| June | 2,380 | 2,060 | 2,197 | 0.337 | 0.38 | 130,729 |
| July | 2,315 | 2,060 | 2,182 | 0.335 | 0.39 | 134,164 |
| August | 2,250 | 1,782 | 2,065 | 0.317 | 0.37 | 126,970 |
| September | 2,380 | 1,474 | 1,771 | 0.272 | 0.30 | 105,380 |
| October | 1,734 | 1,418 | 1,521 | 0.233 | 0.27 | 93,522 |
| November | 1,536 | 600 | 942 | 0.144 | 0.16 | 56,053 |
| December | 857 | 565 | 669 | 0.103 | 0.12 | 41,135 |
| The period | ..... | ..... | ..... | ..... | 2.13 | 736,735 |

ATHABASKA RIVER AT ATHABASKA.

*Location.*—On the SE. ¼ Sec. 20, Tp. 66, Rge. 22, W. 4th Mer., 400 feet above the ferry cable in the town of Athabaska.

*Records available.*—March 17, 1914, to December 31, 1915. Discharge measurements only during the winter of 1912–13 and 1913–14.

*Drainage area.*—29,200 square miles; taken from small scale map and is liable to be in error.

*Gauge.*—Inclined staff, located on left bank of river, 300 feet above ferry cable and 100 feet below measuring section. Zero elevation of gauge maintained at 1,635.38 feet since establishment.

*Bench-marks.*—On a track spike in a telegraph pole on right bank of river; pole located at foot of Strathcona street, north side of C.N.R. track, and opposite Hudson Bay Co's. office. Elevation, 1,660.60 feet. (Canadian Northern Railway datum.) Permanent iron bench-mark set on June 4, 1915, on the left bank close to the downstream side of the cable winch. Elevation, 1,658.00 feet. (Canadian Northern Railway datum.)

*Channel.*—One slightly shifting channel at all stages.

*Discharge measurements.*—Made from a boat run on a cable.

*Winter flow.*—Stream affected by ice from November to April.

*Observer.*—L. J. Cole.

DISCHARGE MEASUREMENTS of Athabaska River at Athabaska, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 6 | P. H. Daniells | 685 | 3,314 | 1.16 | 3.61 | 3,855 |
| Jan. 27 | R. J. McGuinness | 670 | 2,891 | 1.27 | 3.26 | 3,630 |
| Feb. 24 | do | 670 | 2,329 | 1.24 | 2.94 | 2,878 |
| Mar. 24 | J. M. Paul | 678 | 2,977 | 1.49 | 3.67 | 4,439 |
| April 22 | I. R. Strome | 688 | 4,364 | 2.13 | 3.34 | 9,151 |
| May 12 | do | 711 | 5,223 | 2.73 | 4.56 | 14,051 |
| June 1 | do | 740 | 6,170 | 3.11 | 5.76 | 19,018 |
| June 17 | do | 812 | 9,247 | 4.52 | 9.39 | 41,198 |
| July 22 | do | 833 | 12,776 | 5.85 | 13.31 | 73,561 |
| Aug. 24 | do | 801 | 8,251 | 3.84 | 7.91 | 31,174 |
| Sept. 14 | do | 698 | 5,022 | 2.67 | 4.46 | 13,089 |
| Sept. 27 | do | 695 | 4,716 | 2.42 | 3.90 | 11,436 |
| Oct. 14 | do | 685 | 4,225 | 2.06 | 3.29 | 8,719 |
| Nov. 2 | do | 678 | 3,944 | 2.03 | 3.02 | 8,016 |
| Nov. 27 | do | 835 | 3,477 | 1.24 | 3.50 | 4,305 |
| Nov. 29 | do | 835 | 3,286 | 1.25 | 3.40 | 4,110 |
| Dec. 21 | I. R. Strome and C. M. O'Neil | 830 | 2,706 | 1.21 | 3.58 | 3,277 |

DAILY GAUGE HEIGHT AND DISCHARGE of Athabaska River at Athabaska, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.58 | 3,330*a* | 3.15 | 3,640 | 2.86 | 3,080 | 4.50 | 8,500 | 2.95 | 7,887 | 5.62 | 18,395 |
| 2 | 3.58 | 3,500 | 3.10 | 3,620 | 2.86 | 3,090 | 4.60 | 10,600 | 3.00 | 8,050 | 5.82 | 19,345 |
| 3 | 3.59 | 3,590 | 3.10 | 3,620 | 2.86 | 3,130 | 4.60 | 12,300 | 2.95 | 7,887 | 6.20 | 21,200 |
| 4 | 3.60 | 3,690 | 3.05 | 3,600 | 2.86 | 3,150 | 4.98 | 14,000 | 2.98 | 7,985 | 6.68 | 23,840 |
| 5 | 3.61 | 3,770 | 3.00 | 3,600 | 2.86 | 3,200 | 5.00 | 15,600*a* | 3.05 | 8,212 | 7.90 | 31,050 |
| 6 | 3.61 | 3,850 | 3.00 | 3,570 | 2.87 | 3,220 | 4.87 | 15,048 | 3.22 | 8,770 | 8.45 | 34,650 |
| 7 | 3.60 | 3,890 | 2.95 | 3,510 | 2.87 | 3,250 | 4.72 | 14,410 | 3.22 | 8,770 | 8.40 | 34,300 |
| 8 | 3.60 | 3,870 | 2.90 | 3,440 | 2.87 | 3,300 | 4.81*b* | 14,792 | 3.32 | 9,120 | 8.18 | 32,870 |
| 9 | 3.60 | 3,860 | 2.90 | 3,440 | 2.92 | 3,360 | 4.90*b* | 15,175 | 3.42 | 9,470 | 8.12 | 32,480 |
| 10 | 3.60 | 3,830 | 2.95 | 3,450 | 2.92 | 3,430 | 5.00 | 15,600 | 3.65 | 10,275 | 8.02 | 31,830 |
| 11 | 3.60 | 3,790 | 3.00 | 3,450 | 2.93 | 3,490 | 4.90 | 15,175 | 4.12 | 11,980 | 8.88 | 37,660 |
| 12 | 3.60 | 3,780 | 3.00 | 3,420 | 2.93 | 3,540 | 4.77 | 14,623 | 4.62 | 13,985 | 10.25 | 47,900 |
| 13 | 3.50 | 3,760 | 3.00 | 3,390 | 2.98 | 3,600 | 4.72 | 14,410 | 5.02 | 15,690 | 10.38 | 48,940 |
| 14 | 3.50 | 3,690 | 3.00 | 3,300 | 2.98 | 3,670 | 4.62 | 13,985 | 5.42 | 17,490 | 10.25 | 47,900 |
| 15 | 3.50 | 3,600 | 3.00 | 3,220 | 2.98 | 3,730 | 4.33 | 12,820 | 5.45 | 17,625 | 9.95 | 45,563 |
| 16 | 3.50*b* | 3,510 | 3.00 | 3,130 | 3.04 | 3,800 | 4.20 | 12,300 | 5.20 | 16,500 | 9.62 | 43,050 |
| 17 | 3.50 | 3,600 | 3.05 | 3,050 | 3.09 | 3,890 | 4.01 | 11,540 | 4.90 | 15,175 | 9.37 | 41,183 |
| 18 | 3.40 | 3,750 | 3.05 | 2,950 | 3.14 | 3,960 | 3.84 | 10,940 | 4.82 | 14,835 | 9.18 | 39,805 |
| 19 | 3.40 | 3,750 | 3.00 | 2,900 | 3.19 | 4,030 | 3.67 | 10,345 | 4.68 | 14,240 | 9.45 | 42,005 |
| 20 | 3.40 | 3,700 | 3.00 | 2,880 | 3.19 | 4,140 | 3.48 | 9,680 | 4.38 | 13,020 | 9.98 | 45,795 |
| 21 | 3.30 | 3,640 | 3.00 | 2,870 | 3.25 | 4,210 | 3.42 | 9,470 | 4.25 | 12,500 | 9.95 | 45,563 |
| 22 | 3.30 | 3,600 | 3.00 | 2,860 | 3.35 | 4,300 | 3.32 | 9,120 | 4.05 | 11,700 | 9.45 | 42,005 |
| 23 | 3.20 | 3,550 | 2.95 | 2,870 | 3.55 | 4,390 | 3.35 | 9,225 | 4.08 | 11,820 | 9.10 | 39,225 |
| 24 | 3.20 | 3,540 | 2.90 | 2,880 | 3.65 | 4,440 | 3.30 | 9,050 | 4.20 | 12,300 | 9.30 | 40,675 |
| 25 | 3.20 | 3,520 | 2.90 | 2,910 | 3.75 | 4,640 | 3.22 | 8,770 | 4.70 | 14,325 | 8.52 | 35,140 |
| 26 | 3.30 | 3,570 | 2.95 | 2,930 | 3.80 | 4,800 | 3.18 | 8,635 | 4.75 | 14,537 | 8.32 | 33,780 |
| 27 | 3.30 | 3,630 | 2.95 | 3,000 | 3.90 | 5,000 | 3.15 | 8,537 | 4.82 | 14,835 | 8.25 | 33,325 |
| 28 | 3.30 | 3,650 | 2.90 | 3,000 | 4.05 | 5,190 | 3.05 | 8,212 | 5.40 | 17,400 | 9.32 | 40,820 |
| 29 | 3.20 | 3,640 | ..... | ..... | 4.20 | 5,520 | 2.95 | 7,887 | 5.95 | 20,163 | 14.90 | 87,400 |
| 30 | 3.20 | 3,650 | ..... | ..... | 4.30 | 6,000 | 2.90 | 7,725 | 6.05 | 20,450 | 16.08 | 97,620 |
| 31 | 3.20 | 3,650 | ..... | ..... | 4.40 | 6,800 | ..... | ..... | 5.85 | 19,488 | ..... | ..... |

*a* to *a* Ice conditions.
*b* Gauge height interpolated.
*c* Maximum gauge height 16.50 ft.; discharge 101,800 sec.-ft.

DAILY GAUGE HEIGHT AND DISCHARGE of Athabaska River at Athabaska, for 1915—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 14.22 | 81,325 | 8.79 | 37,030 | 6.40 | 22,300 | 3.64 | 10,240 | 2.99 | 8,018 | 3.30 | 4,000 |
| 2 | 12.95 | 70,275 | 8.53 | 35,210 | 6.33 | 21,915 | 3.60 | 10,100 | 3.04 | 8,180 | 3.35 | 4,010 |
| 3 | 11.80 | 60,550 | 8.33 | 33,845 | 6.35 | 22,025 | 3.52 | 9,820 | 3.01 | 8,082 | 3.40 | 4,000 |
| 4 | 11.00 | 53,950 | 8.23 | 33,195 | 6.30 | 21,750 | 3.50 | 9,750 | 2.91 | 7,757 | 3.25 | 3,900 |
| 5 | 10.20 | 47,500 | 8.20 | 33,000 | 5.95 | 20,163 | 3.47 | 9,665 | 2.79 | 7,370 | 3.00 | 3,740 |
| 6 | 9.48 | 42,000 | 8.17 | 32,805 | 5.59 | 18,255 | 3.51 | 9,785 | 2.69 | 7,070 | 3.20 | 3,620 |
| 7 | 9.02 | 38,645 | 8.30 | 33,650 | 5.52 | 17,940 | 3.66 | 10,310 | 2.51 | 6,530 | 3.10 | 3,560 |
| 8 | 8.88 | 37,660 | 8.10 | 32,350 | 5.54 | 18,030 | 3.69 | 10,415 | 2.54 | 6,620 | 3.10 | 3,500 |
| 9 | 8.80 | 37,100 | 7.77 | 30,220 | 5.46 | 17,670 | 3.59 | 10,065 | 2.79 | 7,370 | 3.20 | 3,500 |
| 10 | 8.95 | 38,150 | 7.55 | 28,900 | 5.36 | 17,220 | 3.50 | 9,750 | 2.79 | 7,370 | 3.30 | 3,470 |
| 11 | 8.90 | 37,800 | 7.65 | 29,500 | 5.18 | 16,410 | 3.50 | 9,750 | 2.07 | 5,292 | 3.40 | 3,380 |
| 12 | 9.30 | 40,675 | 7.61 | 29,260 | 4.81 | 14,792 | 3.50 | 9,750 | 1.59 | 4,700*a* | 3.55 | 3,200 |
| 13 | 12.30 | 64,750 | 7.48 | 28,480 | 4.65 | 14,112 | 3.38 | 9,330 | 2.14 | 4,630 | 3.66 | 3,170 |
| 14 | 12.52 | 66,620 | 7.28 | 28,280 | 4.53 | 13,620 | 3.31 | 9,085 | 3.07 | 4,640 | 3.71 | 3,170 |
| 15 | 11.82 | 60,715 | 7.16 | 26,560 | 4.33 | 12,820 | 3.24 | 8,840 | 3.01 | 4,640 | 3.71 | 3,180 |
| 16 | 12.25 | 64,325 | 7.02 | 25,720 | 4.23 | 12,420 | 3.17 | 8,603 | 3.28 | 4,610 | 3.71 | 3,190 |
| 17 | 14.38 | 82,725 | 6.89 | 24,995 | 4.28 | 12,620 | 3.14 | 8,505 | 3.08 | 4,580 | 3.76 | 3,190 |
| 18 | 15.10 | 89,200 | 6.76 | 24,180 | 4.31 | 12,740 | 3.11 | 8,407 | 3.28 | 4,570 | 3.76 | 3,180 |
| 19 | 15.30 | 91,000 | 6.82 | 24,610 | 4.25 | 12,500 | 3.09 | 8,343 | 3.22 | 4,570 | 3.81 | 3,200 |
| 20 | 15.42 | 92,080 | 7.00 | 25,600 | 4.23 | 12,420 | 3.04 | 8,180 | 3.22 | 4,540 | 3.71 | 3,230 |
| 21 | 14.38 | 82,725 | 7.30 | 27,400 | 4.23 | 12,420 | 2.97 | 7,953 | 3.37 | 4,400 | 3.66 | 3,280 |
| 22 | 13.42 | 74,325 | 7.87 | 30,855 | 4.23 | 12,420 | 2.91 | 7,757 | 3.21 | 4,300 | 3.66 | 3,280 |
| 23 | 12.60 | 67,300 | 8.40 | 34,300 | 4.23 | 12,420 | 2.94 | 7,855 | 3.31 | 4,320 | 3.71 | 3,260 |
| 24 | 11.95 | 61,787 | 8.00 | 31,700 | 4.33 | 12,820 | 3.09 | 8,343 | 3.51 | 4,330 | 3.81 | 3,200 |
| 25 | 11.55 | 58,487 | 7.66 | 29,560 | 4.24 | 12,460 | 3.04 | 8,180 | 3.66 | 4,340 | 3.76 | 3,150 |
| 26 | 11.22 | 55,765 | 7.48 | 28,480 | 4.12 | 11,980 | 3.04 | 8,180 | 3.66 | 4,350 | 3.76 | 3,100 |
| 27 | 10.62 | 50,860 | 7.36 | 27,660 | 3.97 | 11,395 | 2.97 | 7,953 | 3.55 | 4,310 | 3.76 | 3,050 |
| 28 | 10.00 | 45,950 | 7.24 | 27,040 | 3.87 | 11,045 | 2.99 | 8,018 | 3.40 | 4,200 | 3.71 | 3,010 |
| 29 | 9.55 | 42,525 | 7.14 | 26,440 | 3.84 | 10,940 | 2.97 | 7,953 | 3.40 | 4,110 | 3.76 | 2,990 |
| 30 | 9.15 | 39,587 | 7.01 | 25,660 | 3.74 | 10,590 | 2.99 | 8,018 | 3.40 | 4,000 | 3.76 | 2,940 |
| 31 | 8.98 | 38,360 | 6.68 | 23,840 | ..... | ..... | 2.97 | 7,953 | ..... | ..... | 3.61 | 2,890*a* |

*a* to *a* Ice conditions.

MONTHLY DISCHARGE of Athabaska River at Athabaska, for 1915.

(Drainage area 29,200 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 3,890 | 3,330 | 3,669 | 0.126 | 0.145 | 225,598 |
| February | 3,610 | 2,860 | 3,232 | 0.111 | 0.116 | 179,500 |
| March | 6,800 | 3,080 | 4,044 | 0.138 | 0.159 | 248,654 |
| April | 15,600 | 7,725 | 11,616 | 0.398 | 0.444 | 691,200 |
| May | 20,450 | 7,887 | 13,112 | 0.449 | 0.518 | 806,226 |
| June | 97,620 | 18,395 | 40,510 | 1.387 | 1.548 | 2,410,500 |
| July | 92,080 | 37,100 | 58,539 | 2.004 | 2.310 | 3,599,418 |
| August | 37,030 | 23,840 | 29,365 | 1.006 | 1.160 | 1,805,630 |
| September | 22,300 | 10,590 | 15,007 | 0.514 | 0.574 | 893,989 |
| October | 10,415 | 7,757 | 8,929 | 0.306 | 0.353 | 549,019 |
| November | 8,180 | 4,000 | 5,460 | 0.187 | 0.209 | 324,890 |
| December | 4,010 | 2,890 | 3,340 | 0.114 | 0.131 | 205,370 |
| The year | ..... | ..... | ..... | ..... | 7.667 | 11,939,994 |

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Athabaska drainage basin, in 1915.

| Date. | Engineer. | Stream. | Location. | Width. | Area of Section. | Mean Velocity. | Discharge. |
|---|---|---|---|---|---|---|---|
| | | | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Sec.-ft.* |
| Jan. 15.... | R. J. McGuinness.. | Embarras River... | SW. 5-52-18-5.... | 104 | 72.9 | 0.32 | 24.000 |
| April 6.... | J. M. Paul..... | do ..... | do .... | 135 | 154.0 | 1.44 | 221.000 |
| Nov. 4.... | do ..... | do ..... | do .... | 98 | 188.0 | 1.04 | 196.000 |
| Nov. 17.... | do ..... | do ..... | do .... | 115 | 174.0 | 0.69 | 120.000 |
| Dec. 6.... | do ..... | do ..... | do .... | 110 | 135.0 | 0.39 | 53.000 |
| April 8.... | do ..... | Fiddle Creek..... | SE. 15-49-27-5.... | 11 | 4.9 | 0.92 | 4.500 |
| Aug. 6.... | do ..... | do ..... | do .... | 86 | 64.8 | 2.20 | 142.000 |
| Sept. 7.... | do ..... | do ..... | do .... | 52 | 36.5 | 2.16 | 79.000 |
| June 10.... | do ..... | Happy Creek..... | SE. 14-51-25-5.... | 8 | 5.6 | 1.41 | 7.800 |
| Sept. 10.... | do ..... | do ..... | do .... | 11 | 10.6 | 0.92 | 9.800 |
| Oct. 15.... | do ..... | Hardisty Creek.... | SE. 24-51-25-5.... | 17 | 8.9 | 0.76 | 6.800 |
| May 18.... | do ..... | Maligne River..... | SW. 33-45-28-5... | 20 | 17.5 | 0.71 | 12.500 |
| June 4.... | do ..... | do .... | do .... | 35 | 34.9 | 2.09 | 73.000 |
| June 25.... | do ..... | do .... | do .... | 49 | 51.3 | 2.46 | 126.000 |
| July 13.... | do ..... | do .... | do .... | 51 | 61.0 | 3.77 | 230.000 |
| Aug. 2.... | do ..... | do .... | do .... | 46 | 41.2 | 2.64 | 108.000 |
| Aug. 18.... | do ..... | do .... | do .... | 46 | 39.4 | 2.45 | 97.000 |
| Sept. 2.... | do ..... | do .... | do .... | 45 | 28.2 | 2.10 | 59.000 |
| Sept. 23.... | do ..... | do .... | do .... | 19 | 15.2 | 1.67 | 26.000 |
| Oct. 7.... | do ..... | do .... | do .... | 23 | 18.8 | 0.87 | 16.400 |
| May 5.... | do ..... | Prairie Creek..... | SE. 8-51-25-5..... | 27 | 30.5 | 0.95 | 29.000 |
| May 24.... | do ..... | do ..... | do ..... | 33 | 24.2 | 1.15 | 28.000 |
| June 11.... | do ..... | do ..... | do ..... | 52 | 77.6 | 3.01 | 234.000 |
| July 3.... | do ..... | do ..... | do ..... | 40 | 68.0 | 3.78 | 257.000 |
| Aug. 7.... | do ..... | do ..... | do ..... | 43 | 40.4 | 1.51 | 61.000 |
| Aug. 23.... | do ..... | do ..... | do ..... | 42 | 40.1 | 2.10 | 80.000 |
| Sept. 8.... | do ..... | do ..... | do ..... | 41 | 27.2 | 1.40 | 38.000 |
| Sept. 27.... | do ..... | do ..... | do ..... | 39 | 23.0 | 1.47 | 34.000 |
| Oct. 13.... | do ..... | do ..... | do ..... | 36 | 26.3 | 0.82 | 22.000 |
| Nov. 1.... | do ..... | do ..... | do ..... | 32 | 27.7 | 0.96 | 27.000 |
| Jan. 19.... | R. J. McGuinness. | Snaring River..... | NW. 33-46-1-6.... | 50 | 60.0 | 0.63 | 38.000 |
| Mar. 18.... | J. M. Paul..... | do .... | do ... | 35 | 30.5 | 1.14 | 35.000 |
| April 26.... | do ..... | do .... | do ... | 110 | 129.0 | 2.12 | 273.000 |
| May 17.... | do ..... | do .... | do ... | 139 | 200.0 | 3.10 | 620.000 |
| June 5.... | do ..... | do .... | do ... | 197 | 425.0 | 4.45 | 1891.000 |
| July 15.... | do ..... | do .... | do ... | 258 | 467.0 | 3.94 | 1840.000 |
| Aug. 20.... | do ..... | do .... | do ... | 219 | 315.0 | 3.59 | 1132.000 |
| Sept. 3.... | do ..... | do .... | do ... | 132 | 136.0 | 3.46 | 471.000 |
| Sept. 22.... | do ..... | do .... | do ... | 121 | 139.0 | 1.73 | 241.000 |
| Oct. 8.... | do ..... | do .... | do ... | 76 | 79.6 | 1.71 | 137.000 |
| Oct. 28.... | do ..... | do .... | do ... | 106 | 102.0 | 2.77 | 283.000 |
| Dec. 14.... | do ..... | do .... | do ... | 45 | 46.0 | 1.74 | 80.000 |
| Mar. 11.... | do ..... | Spring River..... | SE. 2-51-26-5..... | ..... | ..... | ..... | 0.003 |
| May 6.... | do ..... | do ..... | do ..... | ..... | ..... | ..... | 0.003 |
| May 25.... | do ..... | do ..... | do ..... | ..... | ..... | ..... | 0.004 |
| June 10.... | do ..... | do ..... | do ..... | ..... | ..... | ..... | 0.004 |
| July 20.... | do ..... | do ..... | do ..... | ..... | ..... | ..... | 0.004 |
| Aug. 8.... | do ..... | do ..... | do ..... | ..... | ..... | ..... | 0.003 |
| Aug. 24.... | do ..... | do ..... | do ..... | ..... | ..... | ..... | 0.010 |
| Sept. 9.... | do ..... | do ..... | do ..... | ..... | ..... | ..... | 0.017 |
| Sept. 28.... | do ..... | do ..... | do ..... | ..... | ..... | ..... | 0.020 |
| Oct. 14.... | do ..... | do ..... | do ..... | ..... | ..... | ..... | 0.022 |
| Nov. 2.... | do ..... | do ..... | do ..... | ..... | ..... | ..... | 0.022 |
| Mar. 15.... | do ..... | Stony River..... | NW. 26-48-28-5... | 51 | 96.0 | 1.11 | 107.000 |
| May 23.... | do ..... | do ..... | do .. | 207 | 624.0 | 2.62 | 1635.000 |
| Aug. 5.... | do ..... | do ..... | do .. | 165 | 625.0 | 3.64 | 2273.000 |
| Sept. 25.... | do ..... | do ..... | do .. | 81 | 323.0 | 1.79 | 577.000 |
| Dec. 10 .. | do ..... | do ..... | do .. | 38 | 85.8 | 0.83 | 71.000 |
| April 6.... | do ..... | Sundance Creek... | NW. 3-53-18-5.... | 50 | 48.5 | 1.82 | 88.000 |
| April 22.... | do ..... | do ... | do .... | 33 | 27.9 | 1.89 | 53.000 |
| Nov. 4.... | do ..... | do ... | do .... | 34 | 50.2 | 1.40 | 70.000 |
| Aug. 25.... | do ..... | Wolf Creek..... | SW. 3-54-16-5.... | 64 | 78.2 | 1.73 | 135.000 |
| Sept. 14.... | do ..... | do ..... | do .... | 52 | 57.4 | 1.12 | 64.000 |
| Sept. 29.... | do ..... | do ..... | do .... | 48 | 54.1 | 1.06 | 57.000 |
| Oct. 19.... | do ..... | do ..... | do .... | 45 | 41.2 | 2.61 | 107.000 |
| Nov. 5.... | do ..... | do ..... | do .... | 43 | 37.0 | 1.89 | 70.000 |

## NORTH SASKATCHEWAN RIVER DRAINAGE BASIN.

### *General Description.*

The North Saskatchewan River draws its principal water supply from the eastern slope of the Rocky Mountains. The basin is bounded on the south by those of the Red Deer and South Saskatchewan Rivers and on the north by those of the Athabaska and Churchill Rivers. The general trend of the stream from its source to where it joins the South Saskatchewan, a few miles below the city of Prince Albert, and forms the Saskatchewan River, is easterly.

The basin of the river easily divides itself into five parts or divisions, each of which requires a separate description for a clear understanding of the conditions of run-off.

The first, or upper section, consists of the eastern slope of the Rocky Mountains. While this part of the basin is not the greatest in area, it supplies the greater part of the run-off. In glaciers and the perpetual snows of the higher peaks innumerable small streams rise which form the main stream and its larger tributaries. These streams have well defined rocky valleys and considerable fall. The upper regions of this section are not well wooded, and allow a rapid run-off of melting snow and rain.

East of this first section is a division consisting of the foothills, which are, for the most part, well covered with forest and vegetable growth, forming probably the largest in area of the five sections. Here also is a very large source of supply for the stream, but due to its cover, a more regulated supply than in the first section. In this section the main stream is joined by the Clearwater and Brazeau Rivers, two of the most important tributaries of the whole basin. The streams in this section flow through deep valleys with fairly permanent beds and medium slopes.

From a little west of the city of Edmonton to the mouth of the Vermilion River the country is of a parklike nature with large stretches of prairie. This section is small in area and has not a very large run-off. The principal tributaries are the Sturgeon and Vermilion Rivers, the first of which drains in from the wooded country of the north, the latter from the prairie section of the south. The main stream is in a well defined valley with large flats along its course and a more or less permanent bed with a small slope.

Below the third section to a little above the city of Prince Albert is a division which has little drainage into the river. It consists of prairie uplands for the most part, with small patches of timber to the north. The stream widens out into shallow reaches, full of shifting sand bars, and has very little slope. The valley, while still well defined, is also much wider. In this section the main stream is fed by the Battle River, which has its source at the outlet of Battle Lake, and flows eastward through park land and prairie sections south of the main river, until it empties into the latter at the town of Battleford.

The east division is one in which the river with a greater slope and more permanent bed, narrows considerably, as does also the valley. The run-off in this division is mostly from the north, which consists of well wooded country drained by a number of small streams.

Reports of floods in this basin may be found on pages 30 and 31 of the Report of the Progress of Stream Measurements for 1912, and Appendix No. 4 of this report.

#### MISTAYA RIVER

*Location.*—Tp. 34, Rge. 20, W. 5th Mer., about one-quarter mile above mouth of stream.

*Records available.*—Discharge measurements only.

*Gauge.*—None established.

*Bench-mark.*—Standard wooden. Located on left bank about 250 feet above cable. Assumed elevation of 100.00 feet.

*Channel.*—Fairly permanent, bed consisting of small stones and boulders.

*Discharge measurements.*—Made by wading, or from a cable.

*Winter flow.*—Stream affected by ice from November to May.

*Floods.*—During June, 1915, stream was in a violent state of flood overflowing its banks at the lower flats and reaching an elevation of 96.53 feet relative to bench-mark. The slope method gives a corresponding maximum discharge of 2,166 sec.-ft.

*Observer.*—None obtainable.

DISCHARGE MEASUREMENTS of Mistaya River in Tp. 34, Rge. 20, W. 5th Mer., in 1915

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| June 27 | O. H. Hoover | 92.0 | 245.0 | 8.84 | 96.53*b* | 2166*a* |
| July 2 | do | 72.2 | 170.3 | 5.88 | 96.00*b* | 1003 |
| Oct. 9 | do | 41.0 | 58.6 | 2.13 | 94.72*b* | 125 |

*a* Slope measurement.
*b* Water surface elevation.

SIFFLEUR RIVER NEAR WILSON'S RANCH.

*Location.*—Tp. 35, Rge. 17, W. 5th Mer., about three miles southwest of the Wilson Ranger cabin, one and one-half miles above the mouth of the stream.

*Records available.*—Gauge heights, May 17 to May 29, 1915. Discharge measurements during open water season 1915.

*Gauge.*—Vertical staff. Zero maintained at elevation of 89.18 feet since establishment.

*Bench-mark.*—Standard wooden. Located on the right bank about two hundred feet above the gauge. Assumed elevation, 100.00 feet.

*Channel.*—Permanent, consisting of gravel rock.

*Discharge measurements.*—Made from a cable or by wading.

*Winter flow.*—Stream affected by ice from November to May.

*Floods.*—During June, 1915, stream was in violent flood but did not overflow its banks. A stage elevation of 90.64 feet, relative to bench-mark, being about two feet above normal high water, was reached. The slope method gives a corresponding discharge of 1,662 sec.-ft.

*Observer.*—J. W. Chalmers.

DISCHARGE MEASUREMENTS of Siffleur River near Wilson's ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| June 27 | O. H. Hoover | 56.0 | 253.4 | 6.56 | ..... | 1,662*a* |
| June 23 | do | 52.0 | 208.4 | 3.33 | 3.10 | 694 |
| July 4 | do | 51.7 | 177.6 | 7.62 | 3.90 | 1,354 |
| Oct. 6 | do | 53.0 | 114.0 | 1.88 | 1.94 | 214 |
| Oct. 30 | do | 53.2 | 98.3 | 1.37 | 1.69 | 135 |

*a* Slope measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Siffleur River near Wilson's ranch, for 1915.

| Day. | May. | |
|---|---|---|
| | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... |
| 2 | ..... | ..... |
| 3 | ..... | ..... |
| 4 | ..... | ..... |
| 5 | ..... | ..... |
| 6 | ..... | ..... |
| 7 | ..... | ..... |
| 8 | ..... | ..... |
| 9 | ..... | ..... |
| 10 | ..... | ..... |
| 11 | ..... | ..... |
| 12 | ..... | ..... |
| 13 | ..... | ..... |
| 14 | ..... | ..... |
| 15 | ..... | ..... |
| 16 | ..... | ..... |
| 17 | 1.75 | 155 |
| 18 | 2.16*a* | 281 |
| 19 | 2.58*a* | 432 |
| 20 | 2.50 | 400 |
| 21 | 2.60*a* | 440 |
| 22 | 2.70*a* | 485 |
| 23 | 2.80 | 530 |
| 24 | 2.74*a* | 503 |
| 25 | 2.68*a* | 476 |
| 26 | 2.61*a* | 444 |
| 27 | 2.54*a* | 416 |
| 28 | 2.47*a* | 390 |
| 29 | 2.40 | 365 |
| 30 | ..... | ..... |
| 31 | ..... | ..... |

*a* Gauge heights interpolated.

NORTH SASKATCHEWAN RIVER AT WILSON'S RANCH.

*Location.*—Tp. 36, Rge. 18, W. 5th Mer., about one-half mile southwest of the Wilson Ranger cabin.

*Records available.*—Discharge measurements throughout open water season. Gauge heights May 15 to May 31, 1915.

*Gauge.*—Vertical staff maintained at zero elevation of 85.13 feet since establishment.

*Bench-mark.*—Standard wooden. Located on the right bank two hundred and twenty feet below cable. Assumed elevation, 100.00 feet.

*Channel.*—Fairly permanent, consisting of sand and gravel and stone.

*Discharge measurements.*—Made from a cable.

*Winter flow.*—Stream affected by ice from November to May.

*Floods.*—During June 1915, stream was in a violent state of flood but did not overflow its banks. A gauge height of 10.61 feet was reached. The slope method gives a corresponding discharge of 21,176 sec.-ft.

*Observer.*—J. W. Chalmers.

DISCHARGE MEASUREMENTS of North Saskatchewan River at Wilson's ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 18 | O. H. Hoover | 183 | 495 | 2.71 | 4.64 | 1,343 |
| June 20 | do | 197 | 885 | 4.23 | 6.55 | 3,746 |
| June 27 | do | 214 | 1,964 | 10.78 | 10.61 | 21,176*a* |
| July 6 | do | 209 | 1,457 | 7.00 | 8.78 | 10,198 |
| Oct. 5 | do | 181 | 465 | 2.62 | 4.51 | 1,219 |
| Oct. 29 | do | 177 | 378 | 2.33 | 4.02 | 881 |

*a* Slope measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River at Wilson's ranch, for 1915.

| Day. | May. | |
|---|---|---|
| | Gauge. Height. | Dis-charge. |
| | *Feet.* | *Sec.-ft.* |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | |
| 11 | | |
| 12 | | |
| 13 | | |
| 14 | | |
| 15 | 4.85 | 1,495 |
| 16 | 4.60 | 1,280 |
| 17 | 4.50 | 1,2[illegible]0 |
| 18 | 4.65 | 1,320 |
| 19 | 4.80 | 1,450 |
| 20 | 5.00 | 1,640 |
| 21 | 5.40 | 2,0[illegible]0 |
| 22 | 5.55 | 2,240 |
| 23 | 5.60 | 2,3[illegible]0 |
| 24 | 5.75 | 2,480 |
| 25 | 5.80 | 2,540 |
| 26 | 5.85 | 2,6[illegible] |
| 27 | 5.8[illegible] | 2,24[illegible] |
| 28 | 5.65 | 2,[illegible] |
| 29 | 5.70 | 2,4[illegible] |
| 30 | 5.75 | 2,480 |
| 31 | 5.75 | 2,480 |

MONTHLY DISCHARGE of North Saskatchewan River at Wilson's ranch, for 1915.

(Drainage area 836 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| May (15-31) | 2,605 | 1,200 | 2,035 | 2.43 | 1.54 | 68,602 |
| The period | ..... | ..... | ..... | ..... | ..... | ..... |

WHITERABBIT CREEK AT WILSON'S RANCH.

*Location.*—Tp. 36, Rge. 18, W. 5th Mer., about three hundred feet downstream from the Wilson Forest Ranger cabin. On July 7 this station was moved upstream about one mile on account of the change in the course of the Whiterabbit Creek caused by the June flood.

*Records available.*—May 16 to May 31, 1915.

*Gauge.*—Vertical staff. Zero maintained at elevation of 92.58 feet since establishment.

*Channel.*—Shifting, bed of stream sand and gravel.

*Discharge measurements.*—Made by wading or from a temporary cable.

*Winter flow.*—Stream affected by ice from November to May.

*Floods.*—During June, 1915, stream was in a violent state of flood overflowing its banks, and causing a complete diversion of the stream at a point about two miles above its mouth. A maximum gauge height of about 6.00 feet was reached.

*Observer.*—J. W. Chalmers.

DISCHARGE MEASUREMENTS of Whiterabbit Creek at Wilson's ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 13 | O. H. Hoover | 21.2 | 16.5 | 2.42 | .....*a* | 40 |
| May 18 | do | 16.0 | 12.9 | 1.47 | 2.30 | 19 |
| June 20 | do | 32.5 | 33.6 | 2.47 | 2.87 | 83 |
| June 21 | do | 34.5 | 43.7 | 4.26 | 3.10 | 186 |
| July 7 | do | 22.0 | 39.4 | 5.63 | 80.83*c* | 222*b* |
| Oct. 6 | do | 20.0 | 12.0 | 2.08 | 80.52*c* | 25*b* |

*a* Gauge not installed.
*b* Discharge of new gauging station.
*c* Elevation of water level.

DAILY GAUGE HEIGHT AND DISCHARGE of Whiterabbit Creek at Wilson's ranch, for 1915.

| DAY. | May. | |
|---|---|---|
| | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... |
| 2 | ..... | ..... |
| 3 | ..... | ..... |
| 4 | ..... | ..... |
| 5 | ..... | ..... |
| 6 | ..... | ..... |
| 7 | ..... | ..... |
| 8 | ..... | ..... |
| 9 | ..... | ..... |
| 10 | ..... | ..... |
| 11 | ..... | ..... |
| 12 | ..... | ..... |
| 13 | ..... | ..... |
| 14 | ..... | ..... |
| 15 | ..... | ..... |
| 16 | 2.25 | 17.0 |
| 17 | 2.30 | 19.0 |
| 18 | 2.30 | 19.0 |
| 19 | 2.35 | 21.0 |
| 20 | 2.40 | 23.0 |
| 21 | 2.55 | 33.0 |
| 22 | 2.60 | 37.0 |
| 23 | 2.65 | 42.0 |
| 24 | 2.70 | 48.0 |
| 25 | 2.70 | 48.0 |
| 26 | 2.60 | 37.0 |
| 27 | 2.55 | 33.0 |
| 28 | 2.65 | 42.0 |
| 29 | 2.60 | 37.0 |
| 30 | 2.60 | 37.0 |
| 31 | 2.65 | 42.0 |

MONTHLY DISCHARGE of Whiterabbit Creek at Wilson's ranch, for 1915.

(Drainage area 213 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| May (16-31) | 48 | 17 | 33 | 0.155 | 0.09 | 1,047 |
| The period | ..... | ..... | ..... | ..... | ..... | ..... |

CLINE RIVER

*Location.*—Tp. 37, Rge. 18, W. 5th Mer., about three miles above mouth of stream.
*Records available.*—Discharge measurements only.
*Gauge.*—None established.
*Bench-mark.*—Standard wooden. Located 250 feet downstream from cable on the left bank. Assumed elevation of 100.00 feet.
*Channel.*—Shifting, consisting of sand, gravel and rock.
*Discharge measurements.*—Made by wading or from a cable.

*Winter flow.*—Stream affected by ice from November to May.

*Floods.*—During June, 1915, stream was in a violent state of flood but did not overflow its banks at cable. An elevation of 98.00 feet relative to bench-mark was reached.

*Observer.*—None obtainable.

DISCHARGE MEASUREMENTS of Cline River in Tp. 37, Rge. 18, W. 5th Mer., in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| June 18 | O. H. Hoover | 37 | 202.0 | 3.97 | 84.25*b* | 802 |
| July 9 | do | 39 | 203.2 | 8.43 | 88.05*b* | 1,714 |
| Sept. 15 | do | 62 | 96.8 | 3.46 | 84.77*b* | 335 |
| Oct. 4 | do | 66 | 103.0 | 2.73 | 84.34*b* | 284 |
| Nov. 1 | do | 61 | 88.2 | 2.41 | 83.93*b* | 213 |
| Nov. 18 | do | 64 | 80.0 | 2.01 | 83.73*b* | 161*a* |

*a* Slight ice conditions.
*b* Water surface elevation.

## BIGHORN RIVER

*Location.*—Tp. 39, Rge. 16, W. 5th Mer. about two miles above mouth of stream.

*Records available.*—Discharge measurements only.

*Gauge.*—None established.

*Bench-mark.*—Standard wooden. Located on left bank about 30 feet from water edge and about 600 feet downstream from cable. Assumed elevation, 100.00 feet.

*Channel.*—Fairly permanent, consisting of sand, gravel and small boulders.

*Discharge measurements.*—Made by wading or from a cable.

*Winter flow.*—Stream affected by ice from November to May.

*Floods.*—During June, 1915, stream was in a violent state of flood overflowing its banks and reaching an elevation of about 99.00 feet relative to bench-mark.

*Observer.*—None obtainable.

DISCHARGE MEASUREMENTS of Bighorn River in Tp. 39, Rge 16, W. 5th Mer., in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| June 14 | O. H. Hoover | 53.0 | 64.9 | 4.07 | 95.04 | 264 |
| July 11 | do | 81.0 | 94.0 | 4.27 | 95.63 | 401 |
| Sept. 17 | do | 49.5 | 42.4 | 3.16 | 94.82 | 134 |
| Oct. 3 | do | 58.0 | 43.7 | 2.68 | 94.88 | 117 |
| Nov. 3 | do | 35.0 | 25.2 | 1.35 | 94.56*a* | 34 |
| Nov. 21 | do | 14.0 | 14.1 | 1.85 | 96.27*b* | 27 |

*a* Slush ice running.
*b* Ice conditions.

## MARTIN CREEK NEAR NORDEGG.

*Location.*—SE. ¼ Sec. 27, Tp. 40, Rge. 15, W. 5th Mer., about one-quarter of a mile due south of the Canadian Northern Railway depot at Nordegg, and 300 feet upstream from the town power plant.

*Records available.*—June 12 to October 31, 1915.

*Gauge.*—Vertical staff. Zero maintained at elevation of 95.31 feet since establishment.

*Bench-mark.*—Standard wooden. Located on left bank about 40 feet downstream from the gauge. Assumed elevation, 100.00 feet.

*Channel.*—Shifting, consisting of sand, gravel and clay.

*Discharge measurements.*—Made by wading or by a weir.

*Winter flow.*—Stream affected by ice from November to May.

*Floods.*—During June, 1915, stream was in a violent state of flood, overflowing its banks and reaching a gauge height of about 5 feet.

*Observer.*—John Wise, June 12 to September 4; F. Birch, September 5 to October 31.

DISCHARGE MEASUREMENTS of Martin Creek near Nordegg, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| June 12 | O. H. Hoover | 3.0 | 1.65 | 3.22 | 2.20 | 5.40 |
| July 15 | do | 5.8 | 5.36 | 2.84 | 0.83 | 15.20 |
| July 16 | do | 11.3 | 6.70 | 2.09 | 0.76 | 14.00 |
| Aug. 17 | do | 4.7 | 1.68 | 0.39 | 0.33 | 0.66 |
| Aug. 18 | do | 2.8 | 0.41 | 0.88 | 0.35 | 0.36 |
| Aug. 18 | do | ....a | ..... | ..... | 0.35 | 0.49 |
| Aug. 20 | do | ....a | ..... | ..... | 0.40 | 0.81 |
| Sept. 29 | do | ....a | ..... | ..... | 0.25 | 0.21 |
| Nov. 5 | do | ....a | ..... | ..... | ..... | 0.04 |
| Nov. 9 | do | ....b | ..... | ..... | 1.28 | 0.01 |

*a* Weir measurement.
*b* Ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Martin Creek near Nordegg, for 1915.

| Day. | June. | | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 0.70 | 9.1 | 0.45 | 1.40 | 0.24 | 0.18 | 0.20 | 0.10 |
| 2 | ..... | ..... | 0.65 | 6.7 | 0.45 | 1.40 | 0.26 | 0.22 | 0.20 | 0.10 |
| 3 | ..... | ..... | 0.60 | 4.9 | 0.45 | 1.40 | 0.24 | 0.18 | 0.20 | 0.10 |
| 4 | ..... | ..... | 0.60 | 4.9 | 0.41 | 0.92 | 0.24 | 0.18 | 0.20 | 0.10 |
| 5 | ..... | ..... | 0.55 | 3.4 | 0.40 | 0.80 | 0.22 | 0.14 | 0.19 | 0.09 |
| 6 | ..... | ..... | 0.65 | 6.7 | 0.40 | 0.80 | 0.22 | 0.14 | 0.18 | 0.07 |
| 7 | ..... | ..... | 0.60 | 4.9 | p.40 | 0.80 | 0.24 | 0.18 | 0.18 | 0.07 |
| 8 | ..... | ..... | 0.60 | 4.9 | 0.40 | 0.80 | 0.24 | 0.18 | 0.18 | 0.07 |
| 9 | ..... | ..... | 0.60 | 4.9 | 0.40 | 0.80 | 0.26 | 0.22 | 0.17 | 0.06 |
| 10 | ..... | ..... | 0.60 | 4.9 | 0.38 | 0.64 | 0.26 | 0.22 | 0.17 | 0.06 |
| 11 | ..... | ..... | 0.60 | 4.9 | 0.36 | 0.48 | 0.25 | 0.20 | 0.17 | 0.06 |
| 12 | 2.20 | 5.00 | 0.60 | 4.9 | 0.35 | 0.40 | 0.26 | 0.22 | 0.16 | 0.04 |
| 13 | 2.15 | 4.00 | 0.60 | 4.9 | 0.34 | 0.38 | 0.25 | 0.20 | 0.16 | 0.04 |
| 14 | 2.08 | 2.60 | 0.96 | 25.0 | 0.33 | 0.36 | 0.25 | 0.20 | 0.16 | 0.04 |
| 15 | 2.02 | 1.40 | 0.85 | 17.8 | 0.33 | 0.36 | 0.24 | 0.18 | 0.16 | 0.04 |
| 16 | 2.00 | 1.00 | 0.85 | 17.8 | 0.33 | 0.36 | 0.24 | 0.18 | 0.16 | 0.04 |
| 17 | 2.05 | 2.00 | 0.75 | 11.8 | 0.32 | 0.34 | 0.24 | 0.18 | 0.15 | 0.03 |
| 18 | 2.05 | 2.00 | 0.70 | 9.1 | 0.37 | 0.56 | 0.24 | 0.18 | 0.15 | 0.03 |
| 19 | 2.10 | 3.00 | 0.66 | 7.2 | 0.39 | 0.72 | 0.24 | 0.18 | 0.15 | 0.03 |
| 20 | 2.05 | 2.00 | 0.65 | 6.7 | 0.35 | 0.40 | 0.24 | 0.18 | 0.15 | 0.03 |
| 21 | 2.00 | 1.00 | 0.60 | 4.9 | 0.34 | 0.38 | 0.24 | 0.18 | 0.15 | 0.03 |
| 22 | 2.00 | 1.00 | 0.55 | 3.4 | 0.32 | 0.34 | 0.24 | 0.18 | 0.15 | 0.03 |
| 23 | 1.97 | 0.85 | 0.50 | 2.3 | 0.32 | 0.34 | 0.23 | 0.16 | 0.14 | 0.02 |
| 24 | 1.94 | 0.70 | 0.50 | 2.3 | 0.30 | 0.30 | 0.23 | 0.16 | 0.15 | 0.03 |
| 25 | 1.98 | 0.90 | 0.50 | 2.3 | 0.30 | 0.30 | 0.22 | 0.14 | 0.14 | 0.02 |
| 26 | 3.55*a* | 201.00 | 0.50 | 2.3 | 0.28 | 0.26 | 0.22 | 0.14 | 0.14 | 0.02 |
| 27 | 1.20 | 30.00 | 0.45 | 1.4 | 0.26 | 0.22 | 0.22 | 0.14 | 0.14 | 0.02 |
| 28 | 0.90*a* | 21.00 | 0.45 | 1.4 | 0.26 | 0.22 | 0.21 | 0.12 | 0.14 | 0.02 |
| 29 | 0.78 | 13.60 | 0.45 | 1.4 | 0.26 | 0.22 | 0.20 | 0.10 | 0.13 | 0.02 |
| 30 | 0.70 | 9.10 | 0.45 | 1.4 | 0.26 | 0.22 | 0.20 | 0.10 | 0.12 | 0.01 |
| 31 | ..... | ..... | 0.45 | 1.4 | 0.24 | 0.18 | | | 0.12 | 0.01 |

*a* to *a* Shifting conditions.

MONTHLY DISCHARGE of Martin Creek near Nordegg, for 1915.

(Drainage area 5 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| June (12-30) | 201.00 | 0.70 | 15.90 | 3.180 | 2.25 | 599 |
| July | 25.00 | 1.40 | 6.10 | 1.220 | 1.41 | 375 |
| August | 1.40 | 0.18 | 0.55 | 0.110 | 0.13 | 34 |
| September | 0.22 | 0.10 | 0.17 | 0.034 | 0.04 | 10 |
| October (1-31) | 0.10 | 0.10 | 0.05 | 0.010 | 0.01 | 3 |
| The period | ..... | ..... | ..... | ..... | 3.84 | 1,021 |

SHUNDA CREEK NEAR SAUNDERS.

*Location.*—Tp. 40, Rge. 13, W. 5th Mer., about two and one-half miles southwest of Saunders on the Canadian Northern Railway.

*Records available.*—June 1 to June 30 and from August 4 to November 29, 1915.

*Gauge.*—Vertical staff. Zero maintained at elevation of 90.51 feet since establishment.

*Bench-mark.*—Standard wooden. Located on left bank about 100 feet above the gauge. Assumed elevation, 100.00 feet.

*Channel.*—Fairly permanent, consisting of sand, gravel and rock.

*Discharge measurements.*—Made from a temporary cable or by wading.

*Winter flow.*—Stream affected by ice from November to May.

*Floods.*—During June, 1915, stream was in a violent state of flood overflowing its banks and reaching a gauge height of 12.13 feet. The slope method gives a corresponding maximum discharge of 3,426 sec.-ft.

*Observer.*—J. J. Lundy, June 3 to June 24; Wm. Buchner, August 4 to September 26; Thos. Rees, September 27 to December 31.

DISCHARGE MEASUREMENTS of Shunda Creek near Saunders, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| June 3 | O. H. Hoover | 53.5 | 90.2 | 3.81 | 2.98 | 344.0 |
| June 27 | do | 83.0 | 405.4 | 8.45 | 12.13 | 3,426.0*a* |
| Aug. 14 | do | 45.5 | 31.3 | 2.08 | 1.76 | 65.0 |
| Sept. 22 | do | 48.0 | 30.4 | 1.88 | 1.74 | 57.0 |
| Nov. 6 | do | 32.5 | 36.2 | 0.51 | 1.48 | 18.6 |

*a* Slope measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Shunda Creek near Saunders, for 1915.

| Day. | June. | | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.00*b* | 350 | ..... | ..... | ..... | ..... | 1.61 | 37 | 1.78 | 65 |
| 2 | 3.06*b* | 366 | ..... | ..... | ..... | ..... | 1.63 | 40 | 1.90 | 87 |
| 3 | 2.98 | 345 | ..... | ..... | ..... | ..... | 1.60 | 35 | 1.70 | 51 |
| 4 | 2.90 | 323 | ..... | ..... | 2.22 | 152 | 1.58 | 32 | 1.68 | 48 |
| 5 | 2.75 | 282 | ..... | ..... | 2.15 | 138 | 1.56 | 29 | 1.67 | 46 |
| 6 | 2.76*a* | 285 | ..... | ..... | 2.10 | 127 | 1.69 | 49 | 1.75 | 60 |
| 7 | 2.77*a* | 288 | ..... | ..... | 2.00 | 106 | 1.65 | 43 | 1.79 | 67 |
| 8 | 2.78*a* | 291 | ..... | ..... | 1.96 | 98 | 1.60 | 35 | 1.78 | 65 |
| 9 | 2.79*a* | 293 | ..... | ..... | 1.90 | 87 | 1.72 | 55 | 1.78 | 65 |
| 10 | 2.80*a* | 296 | ..... | ..... | 1.87 | 82 | 1.78 | 65 | 1.78 | 65 |
| 11 | 2.81*a* | 299 | ..... | ..... | 1.80 | 69 | 1.69 | 49 | 1.79 | 67 |
| 12 | 2.82*a* | 301 | ..... | ..... | 1.78 | 65 | 1.70 | 51 | 1.78 | 65 |
| 13 | 2.83*a* | 304 | ..... | ..... | 1.76 | 62 | 1.70 | 51 | 1.76 | 62 |
| 14 | 2.84*a* | 307 | ..... | ..... | 1.75 | 60 | 1.78 | 65 | 1.76 | 62 |
| 15 | 2.85*a* | 310 | ..... | ..... | 1.72 | 55 | 1.73 | 56 | 1.76 | 62 |
| 16 | 2.86*a* | 312 | ..... | ..... | 1.70 | 51 | 1.80 | 69 | 1.75 | 60 |
| 17 | 2.87*a* | 315 | ..... | ..... | 1.68 | 48 | 1.60 | 35 | 1.74 | 58 |
| 18 | 2.88*a* | 318 | ..... | ..... | 1.72 | 55 | 1.69 | 49 | 1.74 | 58 |
| 19 | 2.90 | 323 | ..... | ..... | 2.40 | 193 | 1.70 | 51 | 1.74 | 58 |
| 20 | 2.90 | 323 | ..... | ..... | 2.49 | 215 | 1.68 | 48 | 1.75 | 60 |
| 21 | 2.75 | 282 | ..... | ..... | 2.13 | 133 | 1.67 | 46 | 1.75 | 60 |
| 22 | 2.65 | 256 | ..... | ..... | 2.00 | 106 | 1.78 | 65 | 1.74 | 58 |
| 23 | 2.55 | 230 | ..... | ..... | 1.86 | 80 | 1.73 | 56 | 1.74 | 58 |
| 24 | 2.55 | 230 | ..... | ..... | 1.78 | 65 | 1.75 | 60 | 1.75 | 60 |
| 25 | 5.74*a* | 1,162 | ..... | ..... | 1.76 | 62 | 1.74 | 58 | 1.74 | 58 |
| 26 | 8.93*a* | 2,250 | ..... | ..... | 1.73 | 56 | 1.72 | 55 | 1.73 | 56 |
| 27 | 12.13 | 3,426 | ..... | ..... | 1.69 | 49 | 1.71 | 53 | 1.72 | 55 |
| 28 | 9.26*b* | 2,370 | ..... | ..... | 1.67 | 46 | 1.70 | 51 | 1.70 | 51 |
| 29 | 6.39*b* | 1,370 | ..... | ..... | 1.65 | 43 | 1.69 | 49 | 1.69 | 49 |
| 30 | 3.52*b* | 496 | ..... | ..... | 1.64 | 41 | 1.69 | 49 | 1.69 | 49 |
| 31 | ..... | ..... | ..... | ..... | 1.62 | 38 | ..... | ..... | 1.69 | 49 |

*a* Gauge height interpolated.
*b* Gauge height estimated.
No observations in July.

DAILY GAUGE HEIGHT AND DISCHARGE of Shunda Creek near Saunders, for 1915—*Concluded.*

| Day. | November. | | December. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.68 | 48.0 | 2.74 | 19.3*d* |
| 2 | 1.63 | 40.0 | 2.76 | 19.7 |
| 3 | 1.62 | 38.0 | 2.54 | 20.0 |
| 4 | 1.61 | 37.0 | 2.39 | 20.0 |
| 5 | 1.59 | 34.0 | 2.21 | 20.0 |
| 6 | 1.48 | 19.0 | 2.20 | 19.8 |
| 7 | 1.56 | 29.0 | 1.56 | 19.6 |
| 8 | 1.50 | 21.0 | 1.54 | 19.2 |
| 9 | 1.54 | 27.0 | 1.54 | 19.0 |
| 10 | 1.52 | 24.0 | 1.52 | 18.7 |
| 11 | 1.50 | 21.0 | 1.49 | 18.5 |
| 12 | 1.50 | 21.0 | 1.49 | 18.3 |
| 13 | 1.49 | 20.0 | 1.48 | 18.3 |
| 14 | 1.48 | 19.0 | 1.46 | 18.3 |
| 15 | 1.49 | 20.0 | 1.46 | 18.4 |
| 16 | 1.54 | 20.0*c* | 1.49 | 18.5 |
| 17 | 1.76 | 20.0 | 1.52 | 18.7 |
| 18 | 1.89 | 19.8 | 1.56 | 18.8 |
| 19 | 1.92 | 19.7 | 1.59 | 19.0 |
| 20 | 1.92 | 19.5 | 1.59 | 19.0 |
| 21 | 2.00 | 19.5 | 1.56 | 18.8 |
| 22 | 2.00 | 19.5 | 1.53 | 18.7 |
| 23 | 2.10 | 19.6 | 1.53 | 18.4 |
| 24 | 2.00 | 19.5 | 1.53 | 18.3 |
| 25 | 1.98 | 19.5 | 1.49 | 18.2 |
| 26 | 1.92 | 19.2 | 1.49 | 18.0 |
| 27 | 1.85 | 19.0 | 1.47 | 17.8 |
| 28 | 1.75 | 19.0 | 1.47 | 17.5 |
| 29 | 1.89 | 19.0 | 1.46 | 17.2 |
| 30 | 2.70 | 19.0 | 1.46 | 16.5 |
| 31 | ..... | ..... | 1.46 | 15.7 |

*c* Ice conditions after Nov. 16.
*d* Discharge approximate during December.

MONTHLY DISCHARGE of Shunda Creek near Saunders, for 1915.

(Drainage area 120 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| June (1-30) | 3,426 | 230.0 | 610.0 | 5.080 | 5.67 | 36,303 |
| July | ..... | ..... | ..... | ..... | ..... | ..... |
| August (4-31) | 215 | 38.0 | 85.0 | 0.708 | 0.74 | 4,725 |
| September | 65 | 29.0 | 50.0 | 0.417 | 0.46 | 2,975 |
| October | 87 | 46.0 | 59.0 | 0.492 | 0.57 | 3,640 |
| November | 48 | 19.0 | 23.7 | 0.198 | 0.22 | 1,410 |
| December (1-31) | 20 | 15.7 | 18.6 | 0.155 | 0.18 | 1,144 |
| The period | ..... | ..... | ..... | ..... | 7.84 | 50,197 |

NORTH SASKATCHEWAN RIVER NEAR SAUNDERS.

*Location.*—Sec. 14, Tp. 40, Rge. 13, W. 5th Mer., about two miles southwest of Saunders on the Canadian Northern Railway.

*Records available.*—August 4, to December 3, 1915.

*Gauge.*—Vertical staff. Zero maintained at elevation of 81.18 feet since establishment.

*Bench-mark.*—Standard wooden. Located on the left bank 104 feet above cable. Assumed elevation, 100.00 feet.

*Channel.*—Fairly permanent, consisting of gravel, stones and rock.

*Discharge measurements.*—Made from a cable.

*Winter flow.*—Stream affected by ice from November to May.

*Floods.*—During June, 1915, stream was in a violent state of flood overflowing its banks and reaching a gauge height of 15.62 feet. The slope method gives a corresponding maximum discharge of 43,841 sec.-ft.

*Observer.*—Wm. Buchner, August 4 to September 26; Thos. Rees, September 27 to December 31.

DISCHARGE MEASUREMENTS of North Saskatchewan River near Saunders, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| June 27 and 28 | O. H. Hoover | ..... | 4,419 | 8.70 | 15.62 | 43,841*a* |
| Aug. 13 | do | 284 | 1,851 | 6.20 | 6.87 | 11,467 |
| Aug. 13 | do | 284 | 1,879 | 6.30 | 7.00 | 11,830 |
| Sept. 22 | do | 276 | 766 | 3.55 | 3.51 | 2,720 |
| Nov. 8 | do | 244 | 363 | 2.49 | 2.00 | 903 |

*a* Slope measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River near Saunders, for 1915.

| Day. | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 6.80 | 11,230 | 3.29 | 2,414 | 2.70 | 1,580 | 2.19 | 1,061*b* |
| 2 | ..... | ..... | 6.23 | 9,604 | 3.35 | 2,515 | 2.69 | 1,568 | 2.19 | 1,061 |
| 3 | ..... | ..... | 6.00 | 8,960 | 3.34 | 2,498 | 2.50 | 1,350 | 2.45 | 1,060*a* |
| 4 | 7.90 | 14,500 | 6.10 | 9,240 | 3.22 | 2,302 | 2.45 | 1,300 | 2.57 | 1,040 |
| 5 | 7.40 | 13,000 | 6.00 | 8,960 | 3.20 | 2,270 | 2.39 | 1,241 | 2.69 | 1,030 |
| 6 | 7.20 | 12,400 | 5.80 | 8,400 | 3.13 | 2,165 | 2.20 | 1,070 | 2.69 | 1,005 |
| 7 | 7.30 | 12,700 | 5.39 | 7,273 | 3.00 | 1,970 | 2.00 | 900 | 2.72 | 980 |
| 8 | 7.20 | 12,400 | 5.00 | 6,220 | 3.00 | 1,970 | 2.00 | 900 | 2.78 | 950 |
| 9 | 7.25 | 12,550 | 4.60 | 5,200 | 2.98 | 1,942 | 1.98 | 886 | 2.83 | 910 |
| 10 | 7.30 | 12,700 | 4.38 | 4,672 | 2.95 | 1,900 | 1.98 | 886 | 2.90 | 880 |
| 11 | 7.10 | 12,100 | 4.20 | 4,250 | 2.94 | 1,886 | 2.00 | 900 | 2.92 | 850 |
| 12 | 7.15 | 12,250 | 4.06 | 3,932 | 2.94 | 1,886 | 2.00 | 900 | 2.95 | 835 |
| 13 | 7.00 | 11,810 | 3.20 | 2,270 | 2.86 | 1,778 | 2.00 | 900 | 3.46 | 835 |
| 14 | 7.10 | 12,100 | 3.10 | 2,120 | 2.86 | 1,778 | 2.00 | 900 | 3.49 | 838 |
| 15 | 7.20 | 12,400 | 3.05 | 2,045 | 2.86 | 1,778 | 2.14 | 1,016 | 4.63 | 838 |
| 16 | 7.23 | 12,490 | 3.00 | 1,970 | 2.85 | 1,765 | 2.16 | 1,034 | 4.87 | 830 |
| 17 | 7.10 | 12,100 | 2.80 | 1,700 | 2.84 | 1,752 | 2.16 | 1,034 | 5.00 | 825 |
| 18 | 7.50 | 13,300 | 2.50 | 1,350 | 2.84 | 1,752 | 2.19 | 1,061 | 5.00 | 835 |
| 19 | 8.10 | 15,100 | 3.00 | 1,970 | 2.82 | 1,726 | 2.19 | 1,061 | 5.10 | 840 |
| 20 | 8.30 | 15,700 | 3.20 | 2,270 | 2.80 | 1,700 | 2.21 | 1,079 | 4.98 | 845 |
| 21 | 7.70 | 13,900 | 3.90 | 3,580 | 2.80 | 1,700 | 2.24 | 1,106 | 4.96 | 835 |
| 22 | 7.58 | 13,540 | 3.51 | 2,799 | 2.79 | 1,688 | 2.20 | 1,070 | 4.96 | 835 |
| 23 | 7.36 | 12,880 | 3.45 | 2,690 | 2.80 | 1,700 | 2.18 | 1,052 | 4.96 | 825 |
| 24 | 7.30 | 12,700 | 3.72 | 3,210 | 2.79 | 1,688 | 2.16 | 1,034 | 4.89 | 820 |
| 25 | 7.20 | 12,400 | 3.53 | 2,837 | 2.79 | 1,688 | 2.13 | 1,007 | 4.83 | 814 |
| 26 | 7.10 | 12,100 | 3.48 | 2,744 | 2.77 | 1,664 | 2.13 | 1,007 | 4.79 | [illegible] |
| 27 | 7.00 | 11,810 | 3.42 | 2,636 | 2.77 | 1,664 | 2.15 | 1,025 | 4.23 | [illegible] |
| 28 | 6.80 | 11,230 | 3.40 | 2,600 | 2.74 | 1,628 | 2.15 | 1,025 | 4.19 | [illegible] |
| 29 | 6.86 | 11,404 | 3.35 | 2,515 | 2.73 | 1,616 | 2.19 | 1,061 | 4.16 | [illegible] |
| 30 | 7.00 | 11,810 | 3.29 | 2,414 | 2.73 | 1,616 | 2.14 | 1,016 | 4.00 | [illegible] |
| 31 | 7.05 | 11,955 | .. | . . | 2.72 | 1,604 | | | 4.00 | [illegible] |

*a* Ice conditions.
*b* Discharges approximate during December.

MONTHLY DISCHARGE of North Saskatchewan River near Saunders, for 1915.

(Drainage area 1,689 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| August (4–31) | 15,700 | 11,230 | 12,690 | 7.510 | 7.82 | 704,600 |
| September | 11,230 | 1,350 | 4,389 | 2.600 | 2.90 | 261,164 |
| October | 2,515 | 1,604 | 1,871 | 1.110 | 1.28 | 115,043 |
| November | 1,580 | 886 | 1,066 | 0.631 | 0.70 | 63,431 |
| December (1–31) | 1,061 | 690 | 869 | 0.514 | 0.59 | 53,433 |
| The period | ..... | ..... | ..... | ..... | 13.29 | 1,197,671 |

RAM RIVER.

*Location.*—Tp. 39, Rge. 11, W. 5th Mer., about one and one-half miles above the stream mouth.

*Records available.*—Discharge measurements only.

*Gauge.*—None established.

*Bench-mark.*—Standard wooden: Located on the right bank near Forestry trail, about 100 yards above gauging section. Assumed elevation, 100.00 feet.

*Channel.*—Fairly permanent, consisting of sand, gravel and shale.

*Discharge measurements.*—Made by wading or from a temporary cable.

*Winter flow.*—Stream affected by ice from November to May.

*Floods.*—During June, 1915, stream was in a violent state of flood overflowing its banks, and reaching an elevation of 100.95 feet relative to bench-mark. The slope method gives a corresponding maximum discharge of 33,579 sec.-ft.

*Observer.*—None obtainable.

DISCHARGE MEASUREMENTS of Ram River in Tp. 39, Rge. 11, W. 5th Mer., in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| June 27 | O. H. Hoover | 338 | 2,869 | 11.704 | 99.86*b* | 33,579*a* |
| Aug. 10 | do | 166 | 327 | 3.290 | 90.70*b* | 1,076 |
| Sept. 25 | do | 157 | 276 | 2.570 | 90.46*b* | 710 |

*a* Slope measurement.
*b* Water surface elevation.

CLEARWATER RIVER NEAR ROCKY MOUNTAIN HOUSE.

*Location.*—On SE. ¼ sec. 16, Tp. 39, Rge. 7, W. 5th Mer., on G. Fletcher's farm, three miles southwest of Rocky Mountain House.

*Records available.*—January 1, 1914, to December 31, 1915.

*Gauges.*—Chain gauge, located on left bank of river 60 feet upstream from the cable. There is a staff gauge on the right bank of the river, and in the same section which is used by the observer during the open water season. The zero elevation of the gauges has been maintained at 3,105.04 feet since establishment.

*Bench-marks.*—On nails in a poplar stump directly in front of cable tower on the right bank. Elevation, 3,120.00 feet. (Department of Public Works of Canada datum.) On June 4th, 1915, a permanent iron bench-mark was set 3 feet upstream from the cable tower on the right bank. Its elevation is 3,118.39 feet and is referred to the old datum.

*Channel.*—One permanent channel at low water and probably two in high stages.

*Discharge measurements.*—Made from a cable car.

*Winter flow.*—Stream affected by ice from November to April and measurements are made 300 feet below the cable section.

*Floods.*—In the latter part of June, 1915, this stream was in violent flood and rose about 14 feet in 36 hours. At a gauge height of 15 feet it overflowed the left bank and did considerable damage to low lying farm lands. The maximum gauge height of 18.08 feet was reached on June 27. During the flood the cables and gauges were carried downstream. The main cable was recovered and the station re-erected on July 8.

*Observer.*—G. Fletcher.

DISCHARGE MEASUREMENTS of Clearwater River near Rocky Mountain House, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 15 | H. S. Kerby | 155*a* | 323 | 0.53 | 2.28 | 171 |
| Feb. 5 | do | 143*a* | 306 | 0.66 | 2.45 | 200 |
| Feb. 26 | H. W. Rowley | 155*a* | 289 | 0.64 | 2.51 | 184 |
| Mar. 18 | R. J. McGuinness | 165*a* | 371 | 0.77 | 3.05 | 286 |
| April 15 | I. R. Strome | 175 | 432 | 0.69 | 1.47 | 302 |
| May 3 | do | 184 | 492 | 0.93 | 1.90 | 458 |
| May 19 | do | 196 | 816 | 2.30 | 3.47 | 1,879 |
| June 10 | do | 198 | 930 | 2.88 | 4.12 | 2,680 |
| July 9 | do | 210 | 1,290 | 3.15 | 5.29 | 4,059 |
| Aug. 6 | do | 209 | 1,110 | 2.71 | 4.56 | 3,009 |
| Sept. 4 | do | 203 | 915 | 2.12 | 3.72 | 1,939 |
| Sept. 23 | do | 201 | 802 | 1.66 | 3.22 | 1,330 |
| Oct. 7 | do | 200 | 776 | 1.57 | 3.06 | 1,217 |
| Oct. 26 | do | 196 | 697 | 1.25 | 2.67 | 871 |
| Dec. 3 | F. K. Beach | 225*a* | 536 | 1.10 | 4.09 | 590 |
| Dec. 29 | do | 219*a* | 342 | 0.87 | 3.93 | 305 |

*a* Ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Clearwater River near Rocky Mountain House, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge | Gauge Height. | Discharge |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.00 | 160*a* | 2.28 | 188 | 2.55 | 197 | 2.46 | 295 | 1.80 | 480 | 3.72 | 2,164 |
| 2 | 2.00 | 162 | 2.33 | 185 | 2.60 | 192 | 2.36 | 298 | 1.85 | 510 | 3.97 | 2,464 |
| 3 | 2.01 | 162 | 2.38 | 184 | 2.60 | 188 | 2.26 | 304 | 1.95 | 570 | 5.00 | 3,875 |
| 4 | 2.02 | 162 | 2.37 | 191 | 2.61 | 190 | 2.21 | 320*a* | 2.28 | 799 | 4.70 | 3,430 |
| 5 | 2.13 | 162 | 2.37 | 200 | 2.61 | 198 | 1.78 | 375*e* | 2.82 | 1,238 | 4.30 | 2,890 |
| 6 | 2.24 | 161 | 2.37 | 209 | 2.61 | 197 | 1.71 | 430 | 2.91 | 1,319 | 4.18 | 2,734 |
| 7 | 2.25 | 162 | 2.42 | 212 | 2.67 | 193 | 1.66 | 405 | 2.93 | 1,337 | 4.08 | 2,604 |
| 8 | 2.26 | 162 | 2.47 | 212 | 2.67 | 192 | 1.58 | 365 | 2.92 | 1,328 | 4.01 | 2,513 |
| 9 | 2.27 | 162 | 2.51 | 212 | 2.67 | 198 | 1.56 | 355 | 3.04 | 1,440 | 4.16 | 2,708 |
| 10 | 2.28 | 163 | 2.51 | 210 | 2.68 | 204 | 1.56 | 355 | 2.97 | 1,373 | 4.12 | 2,656 |
| 11 | 2.29 | 165 | 2.56 | 200 | 2.68 | 209 | 1.52 | 335 | 2.79 | 1,211 | 4.32 | 2,916 |
| 12 | 2.35 | 166 | 2.56 | 193 | 2.68 | 219 | 1.49 | 320 | 2.63 | 1,079 | 4.28 | 2,864 |
| 13 | 2.36 | 168 | 2.55 | 187 | 2.68 | 225 | 1.47 | 313 | 2.74 | 1,167 | 4.25 | 2,825 |
| 14 | 2.37 | 170 | 2.45 | 186 | 2.69 | 235 | 1.47 | 313 | 3.09 | 1,490 | 4.15 | 2,695 |
| 15 | 2.32 | 171 | 2.44 | 187 | 2.69 | 249 | 1.47 | 313 | 3.82 | 2,284 | 4.18 | 2,734 |
| 16 | 2.22 | 181 | 2.39 | 190 | 2.84 | 261 | 1.47 | 313 | 3.94 | 2,428 | 4.25 | 2,825 |
| 17 | 2.21 | 200 | 2.39 | 190 | 2.90 | 272 | 1.48 | 317 | 3.53 | 1,936 | 4.25 | 2,825 |
| 18 | 2.31 | 205 | 2.34 | 193 | 3.05 | 286 | 1.48 | 317 | 3.49 | 1,890 | 4.62 | 3,318 |
| 19 | 2.41 | 206 | 2.38 | 197 | 3.05 | 295 | 1.49 | 321 | 3.47 | 1,870 | 4.30 | 2,890 |
| 20 | 2.40 | 203 | 2.62 | 199 | 3.05 | 300 | 1.49 | 321 | 3.40 | 1,800 | 4.22 | 2,786 |
| 21 | 2.40 | 198 | 2.51 | 200 | 3.05 | 301 | 1.61 | 380 | 3.40 | 1,800 | 4.05 | 2,565 |
| 22 | 2.30 | 192 | 2.46 | 193 | 3.05 | 302 | 1.63 | 390 | 3.50 | 1,900 | 3.95 | 2,440 |
| 23 | 2.30 | 188 | 2.40 | 190 | 3.05 | 302 | 1.63 | 390 | 3.48 | 1,880 | 3.95 | 2,440 |
| 24 | 2.29 | 182 | 2.49 | 184 | 3.10 | 298 | 1.63 | 390 | 3.53 | 1,936 | 4.02 | 2,525 |
| 25 | 2.39 | 180 | 2.48 | 183 | 3.05 | 296 | 1.67 | 410 | 3.64 | 2,068 | 4.65 | [illegible] |
| 26 | 2.29 | 176 | 2.47 | 184 | 2.25 | 286 | 1.75 | 450 | 3.81 | 2,272 | 10.52 | 15,800 |
| 27 | 2.29 | 174 | 2.48 | 188 | 2.30 | 279 | 1.69 | 420 | 3.74 | 2,188 | 17.58 | 16,100 |
| 28 | 2.29 | 172 | 2.54 | 194 | 2.35 | 277 | 1.68 | 415 | 3.54 | 1,948 | 11.02 | [illegible] |
| 29 | 2.29 | 171 | ... | ... | 2.40 | 278 | 1.69 | 420 | 3.44 | 1,840 | 9.48 | 12,710 |
| 30 | 2.28 | 172 | ... | ... | 2.45 | 281 | 1.69 | 420 | 3.99 | 2,488 | 8.22 | 9,650 |
| 31 | 2.28 | 178 | ... | ... | 2.50 | 292 | | | 3.82 | 2,284 | | |

*a* to *a* Ice conditions.
*b* to *b* Gauge washed out; water surface marked by stakes.
*c* Maximum gauge height 18.08 feet.
*e* Discharge interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of Clearwater River near Rocky Mountain House, for 1915.

—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 7.40*b* | 7,840 | 5.17 | 3,855 | 4.01 | 2,238 | 3.09 | 1,240 | 2.70 | 885 | 3.95 | 607 |
| 2 | 6.86 | 6,759 | 5.12 | 3,780 | 3.98 | 2,203 | 3.09 | 1,240 | 2.70 | 885 | 4.00 | 595 |
| 3 | 6.00 | 5,175 | 5.02 | 3,630 | 3.83 | 2,238 | 3.16 | 1,310 | 2.68 | 869 | 4.12 | 590 |
| 4 | 5.69 | 4,679 | 4.92 | 3,488 | 3.73 | 1,928 | 3.19 | 1,340 | 2.65 | 845 | 4.10 | 570 |
| 5 | 5.69 | 4,679 | 4.78 | 3,292 | 3.63 | 1,818 | 3.14 | 1,290 | 2.60 | 805 | 4.23 | 555 |
| 6 | 5.69 | 4,679 | 4.58 | 3,012 | 3.63 | 1,818 | 3.12 | 1,270 | 2.63 | 829 | 4.15 | 539 |
| 7 | 5.80*b* | 4,855 | 4.48 | 2,872 | 3.58 | 1,763 | 3.05 | 1,200 | 2.65 | 845 | 4.00 | 523 |
| 8 | 5.50 | 4,375 | 4.41 | 2,774 | 3.53 | 1,708 | 2.98 | 1,132 | 2.66 | 853 | 4.01 | 520 |
| 9 | 5.28 | 4,023 | 4.43 | 2,802 | 3.58 | 1,763 | 2.88 | 1,042 | 2.72 | 901 | 4.14 | 521 |
| 10 | 5.20 | 3,900 | 4.35 | 2,690 | 3.58 | 1,763 | 2.92 | 1,078 | 2.78 | 952 | 4.03 | 505 |
| 11 | 4.98 | 3,572 | 4.18 | 2,459 | 3.48 | 1,653 | 3.00 | 1,150 | 2.92 | 912*f* | 3.86 | 502 |
| 12 | 4.72 | 3,208 | 4.03 | 2,264 | 3.43 | 1,598 | 2.95 | 1,105 | 3.04 | 862*f* | 3.85 | 492 |
| 13 | 4.79 | 3,306 | 4.03 | 2,264 | 3.35 | 1,510 | 2.88 | 1,042 | 3.03 | 812*f* | 3.85 | 475 |
| 14 | 6.04 | 5,246 | 3.93 | 2,148 | 3.33 | 1,488 | 2.88 | 1,015 | 3.24 | 762*d* | 3.97 | 458 |
| 15 | 9.40 | 12,540 | 3.93 | 2,148 | 3.31 | 1,466 | 2.80 | 970 | 3.60 | 741 | 4.08 | 450 |
| 16 | 8.31 | 9,863 | 3.98 | 2,203 | 3.33 | 1,488 | 2.78 | 952 | 4.12 | 736 | 4.09 | 452 |
| 17 | 8.21 | 9,633 | 3.93 | 2,148 | 3.33 | 1,488 | 2.75 | 925 | 4.13 | 730 | 4.00 | 457 |
| 18 | 9.01 | 11,526 | 3.91 | 2,126 | 3.33 | 1,488 | 2.76 | 934 | 3.34 | 725 | 3.96 | 460 |
| 19 | 7.96 | 9,062 | 4.35 | 2,690 | 3.33 | 1,488 | 2.78 | 952 | 3.35 | 718 | 3.82 | 463 |
| 20 | 7.26 | 7,546 | 5.43 | 4,263 | 3.31 | 1,466 | 2.76 | 934 | 3.36 | 713 | 3.80 | 455 |
| 21 | 6.81 | 6,664 | 8.38 | 10,024 | 3.28 | 1,433 | 2.75 | 925 | 3.77 | 718 | 3.89 | 427 |
| 22 | 8.36 | 9,978 | 6.13 | 5,409 | 3.25 | 1,400 | 2.72 | 901 | 3.78 | 711 | 4.01 | 432 |
| 23 | 6.13 | 5,409 | 5.35 | 4,135 | 3.23 | 1,380 | 2.70 | 885 | 3.79 | 700 | 4.01 | 425 |
| 24 | 5.86 | 4,953 | 5.01 | 3,615 | 3.23 | 1,380 | 2.69 | 877 | 3.80 | 673 | 4.00 | 408 |
| 25 | 5.53 | 4,423 | 4.75 | 3,250 | 3.28 | 1,433 | 2.66 | 853 | 3.81 | 651 | 4.00 | 387 |
| 26 | 5.44 | 4,277 | 4.58 | 3,012 | 3.23 | 1,380 | 2.65 | 845 | 3.83 | 642 | 4.09 | 382 |
| 27 | 5.22 | 3,930 | 4.38 | 2,732 | 3.18 | 1,330 | 2.66 | 853 | 3.85 | 633 | 4.10 | 362 |
| 28 | 5.04 | 3,660 | 4.23 | 2,524 | 3.13 | 1,280 | 2.66 | 853 | 3.91 | 621 | 4.14 | 330 |
| 29 | 5.54 | 4,439 | 4.15 | 2,420 | 3.13 | 1,280 | 2.66 | 853 | 3.98 | 622 | 3.93 | 305 |
| 30 | 5.37 | 4,167 | 4.05 | 2,290 | 3.08 | 1,230 | 2.66 | 853 | 4.04 | 622 | 3.96 | 305 |
| 31 | 5.22 | 3,930 | 4.03 | 2,264 | ..... | ..... | 2.70 | 885 | ..... | ..... | 3.97 | 312*d* |

*b* to *b* Gauge washed out; water surface marked by stakes.
*d* to *d* Ice conditions.
River freezing up; discharge interpolated.

MONTHLY DISCHARGE of Clearwater River near Rocky Mountain House, for 1915.

(Drainage area 881 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 206 | 160 | 175 | 0.199 | 0.23 | 10,760 |
| February | 212 | 183 | 194 | 0.220 | 0.23 | 10,774 |
| March | 302 | 188 | 248 | 0.282 | 0.33 | 15,249 |
| April | 450 | 295 | 359 | 0.407 | 0.45 | 21,362 |
| May | 2,488 | 480 | 1,618 | 1.840 | 2.12 | 99,490 |
| June | 39,100 | 2,164 | 5,688 | 6.460 | 7.21 | 338,460 |
| July | 12,540 | 3,208 | 5,881 | 6.680 | 7.70 | 361,610 |
| August | 10,024 | 2,126 | 3,180 | 3.610 | 4.16 | 195,530 |
| September | 2,238 | 1,230 | 1,590 | 1.800 | 2.01 | 94,610 |
| October | 1,340 | 845 | 1,023 | 1.160 | 1.34 | 62,903 |
| November | 952 | 621 | 766 | 0.869 | 0.97 | 45,580 |
| December | 607 | 305 | 460 | 0.522 | 0.60 | 28,284 |
| The year | ..... | ..... | ..... | ..... | 27.35 | 1,284,612 |

NORTH SASKATCHEWAN RIVER NEAR ROCKY MOUNTAIN HOUSE.

*Location.*—On the NE. ¼ Sec. 21, Tp. 39, Rge. 7, W. 5th Mer., 2,000 feet below the railway bridge and one mile west of Rocky Mountain House.

*Records available.*—From June 2, 1913, to December 31, 1915.

*Gauge.*—Inclined staff graduated to feet and tenths. From June 2, 1913, to June 27, 1915, located 1,200 feet above the cable on the left bank. Zero elevation maintained at 3,108.39 feet from June 2, 1913, to October 23, 1913. Zero elevation maintained at 3,108.42 feet from October 23, 1913, to June 27, 1915. After June 28, 1915, the gauge was located 20 feet below the cable, on the left bank and has been maintained at a zero elevation of 3,108.47 feet.

*Bench-marks.*—On nails in a spruce tree, on the north side of the road allowance, on the left bank of the river and 50 feet from the edge of the bank; elevation 3,126.93 feet. (Department of Public Works of Canada datum.) On October 8, 1915, a permanent iron bench-mark was set on the left bank 3 feet above the cable tower. Elevation, 3,125.96 feet. (Department of Public Works of Canada datum.)

*Channel.*—One channel at all stages.

*Discharge measurements.*—Made from a cable car.

*Winter flow.*—Stream affected by ice from November to April and measurements made 1,400 feet above the cable section.

*Floods.*—In the latter part of June, 1915, this stream was in violent flood and rose 14 feet in about 36 hours. At a gauge height of 14.0 feet the right bank overflowed and at a gauge height of 18.0 feet the left bank overflowed. Considerable damage was done to low lying farm lands along the river. A maximum gauge height of 23.38 feet was reached on June 27. During this flood the gauge and cables were swept away. A new gauge was put in at once but owing to the high water stage, existing all summer, the new cable was not put in place until early in September, which accounts for the fact that there were no gaugings taken between June 11 and September 8, 1915.

*Observer.*— Wm. Austin.

DISCHARGE MEASUREMENTS of North Saskatchewan River near Rocky Mountain House, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 14 | H. S. Kerby | 405*a* | 672 | 1.23 | 6.30 | 824 |
| Feb. 4 | do | 405*a* | 528 | 1.51 | 6.34 | 795 |
| Feb. 25 | do | 410*a* | 461 | 1.52 | 5.82 | 702 |
| Mar. 17 | R. J. McGuinness | 405*a* | 404 | 1.56 | 6.40 | 631 |
| April 14 | I. R. Strome | 421 | 668 | 2.11 | 4.07 | 1,406 |
| May 3 | do | 426 | 846 | 2.70 | 4.58 | 2,282 |
| May 20 | do | 434 | 1,419 | 3.94 | 6.05 | 5,592 |
| May 28 | O. H. Hoover | 440 | 1,623 | 4.51 | 6.72 | 7,318 |
| June 11 | I. R. Strome | 443 | 2,054 | 5.28 | 7.68 | 10,852 |
| * | | | | | | |
| Sept. 8 | do | 512*b* | 1,909 | 4.21 | 5.60 | 8,043 |
| Sept. 24 | do | 510 | 1,456 | 3.53 | 4.70 | 5,148 |
| Oct. 7 | do | 510 | 1,216 | 3.16 | 4.23 | 3,941 |
| Oct. 26 | do | 506*b* | 1,055 | 2.98 | 3.70 | 3,141 |
| Dec. 2 | F. K. Beach | 407*a* | 1,196 | 1.12 | 5.24 | 1,335 |
| Dec. 28 | do | 405*a* | 1,305 | 1.08 | 5.41 | 1,411 |

*Gauging equipment carried away by flood June 26, 1915.
*a* Ice conditions.
*b* to *b* New gauge datum; separate curve.

DAILY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River near Rocky Mountain House, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 6.30 | 875*a* | 6.13 | 791 | 6.00 | 687 | 6.34 | 850 | 4.44 | 2,052 | 6.60 | 7,180 |
| 2 | 6.45 | 872 | 6.23 | 795 | 6.10 | 682 | 6.39 | 852 | 4.47 | 2,106 | 7.48 | 10,108 |
| 3 | 6.40 | 875 | 6.13 | 795 | 6.15 | 683 | 6.39 | 900 | 4.54 | 2,232 | 8.22 | 13,026 |
| 4 | 6.50 | 875 | 6.29 | 795 | 6.20 | 683 | 6.44 | 940 | 4.75 | 2,625 | 7.65 | 10,730 |
| 5 | 6.35 | 870 | 6.34 | 798 | 6.15 | 680 | 6.44 | 1,010 | 5.12 | 3,372 | 7.52 | 10,252 |
| 6 | 6.30 | 860 | 6.34 | 791 | 6.15 | 670 | 5.28 | 1,250*b* | 5.18 | 3,498 | 7.42 | 9,892 |
| 7 | 6.20 | 855 | 6.29 | 788 | 6.15 | 665 | 4.78 | 1,490*b* | 5.40 | 4,000 | 7.30 | 9,470 |
| 8 | 6.15 | 845 | 6.24 | 788 | 6.10 | 660 | 4.25 | 1,725 | 5.80 | 4,980 | 7.55 | 10,360 |
| 9 | 6.40 | 840 | 6.29 | 786 | 6.00 | 655 | 4.15 | 1,560 | 6.20 | 6,040 | 7.52 | 10,252 |
| 10 | 6.50 | 847 | 6.34 | 780 | 6.15 | 650 | 4.18 | 1,608 | 6.35 | 6,460 | 7.52 | 10,252 |
| 11 | 6.45 | 843 | 6.34 | 779 | 6.20 | 640 | 3.95 | 1,250 | 6.42 | 6,658 | 7.68 | 10,844 |
| 12 | 6.40 | 837 | 6.29 | 771 | 6.20 | 640 | 3.99 | 1,306 | 6.12 | 5,824 | 7.62 | 10,616 |
| 13 | 6.40 | 830 | 6.34 | 762 | 6.25 | 638 | 3.98 | 1,292 | 6.00 | 5,500 | 7.68 | 10,844 |
| 14 | 6.30 | 824 | 6.29 | 752 | 6.30 | 630 | 4.08 | 1,448 | 6.25 | 6,180 | 7.88 | 11,620 |
| 15 | 6.25 | 822 | 6.19 | 740 | 6.25 | 627 | 3.99 | 1,306 | 6.50 | 6,890 | 7.82 | 11,380 |
| 16 | 6.20 | 822 | 6.24 | 730 | 6.35 | 627 | 3.98 | 1,292 | 6.55 | 7,035 | 8.00 | 12,100 |
| 17 | 6.25 | 824 | 6.34 | 732 | 6.35 | 630 | 4.05 | 1,400 | 6.22 | 6,096 | 8.42 | 13,886 |
| 18 | 6.30 | 832 | 6.29 | 737 | 6.45 | 640 | 4.11 | 1,496 | 6.10 | 5,770 | 8.68 | 15,012 |
| 19 | 6.40 | 840 | 6.24 | 733 | 6.55 | 650 | 4.18 | 1,608 | 6.02 | 5,554 | 8.35 | 13,585 |
| 20 | 6.35 | 839 | 6.29 | 730 | 6.55 | 660 | 4.21 | 1,657 | 6.05 | 5,635 | 8.22 | 13,026 |
| 21 | 6.30 | 837 | 6.29 | 721 | 6.65 | 672 | 4.31 | 1,827 | 6.28 | 6,264 | 8.12 | 12,604 |
| 22 | 6.20 | 834 | 6.09 | 718 | 6.65 | 688 | 4.25 | 1,725 | 6.60 | 7,180 | 7.92 | 11,780 |
| 23 | 6.20 | 830 | 6.14 | 715 | 6.70 | 703 | 4.25 | 1,725 | 6.62 | 7,242 | 7.98 | 12,020 |
| 24 | 6.15 | 825 | 6.24 | 710 | 6.60 | 720 | 4.21 | 1,657 | 6.60 | 7,180 | 8.20 | 12,940 |
| 25 | 6.10 | 819 | 5.79 | 702 | 6.55 | 732 | 4.21 | 1,657 | 6.80 | 7,800 | 9.30 | 17,830 |
| 26 | 6.12 | 810 | 5.84 | 700 | 6.40 | 727 | 4.28 | 1,776 | 7.08 | 8,712 | 14.10 | 48,100 |
| 27 | 5.72 | 800 | 5.94 | 698 | 6.35 | 707 | 4.28 | 1,776 | 6.95 | 8,280 | 22.10*c* | 129,700 |
| 28 | 6.42 | 793 | 6.04 | 695 | 6.40 | 710 | 4.25 | 1,725 | 6.68 | 7,428 | 20.80 | 115,600 |
| 29 | 5.62 | 785 | ..... | ..... | 6.35 | 730 | 4.18 | 1,608 | 7.00 | 8,440 | 14.40 | 58,000 |
| 30 | 5.92 | 785 | ..... | ..... | 6.30 | 780 | 4.31 | 1,827 | 7.18 | 9,052 | 12.40*c* | 43,800 |
| 31 | 6.02 | 787 | ..... | ..... | 6.30 | 847 | ..... | ..... | 6.82 | 7,864 | ..... | ..... |

*a* to *a* Ice conditions.
*b* Ice going out. Discharge interpolated.
*c* to *c* Gauge heights interpolated. Gauge washed out. High water mark, 23.38 feet, June 27th. Maximum discharge estimated to be 145,000 sec.-feet.

DAILY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River near Rocky Mountain House, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 10.80*c* | 33,600 | 8.08 | 18,500 | 6.70 | 12,400 | 4.43 | 4,575 | 3.62 | 3,030 | 5.10 | 1,340 |
| 2 | 9.40 | 25,400 | 7.90 | 17,650 | 6.57 | 11,880 | 4.53 | 4,825 | 3.60 | 3,000 | 5.23 | 1,335 |
| 3 | 9.20 | 24,300 | 8.05 | 18,350 | 6.53 | 11,720 | 4.57 | 4,925 | 3.55 | 2,925 | 5.50 | 1,330 |
| 4 | 9.10 | 23,750 | 8.28 | 19,500 | 6.25 | 10,600 | 4.53 | 4,825 | 3.58 | 2,970 | 6.10 | 1,325 |
| 5 | 9.10*c* | 23,750 | 7.88 | 17,560 | 6.15 | 10,200 | 4.43 | 4,575 | 3.52 | 2,880 | 6.45 | 1,320 |
| 6 | 9.04 | 23,420 | 7.52 | 15,940 | 6.17 | 10,280 | 4.35 | 4,387 | 3.50 | 2,850 | 6.50 | 1,330 |
| 7 | 8.84 | 22,320 | 7.48 | 15,760 | 6.10 | 10,000 | 4.25 | 4,162 | 3.40 | 2,700 | 5.95 | 1,330 |
| 8 | 8.87 | 22,485 | 7.52 | 15,940 | 5.65 | 8,238 | 4.20 | 4,050 | 3.30 | 2,575 | 6.25 | 1,325 |
| 9 | 8.20 | 19,100 | 7.50 | 15,850 | 5.53 | 7,788 | 4.08*e* | 3,810 | 3.32 | 2,600 | 6.20 | 1,320 |
| 10 | 7.96 | 17,920 | 7.40 | 15,400 | 5.30 | 6,950 | 4.08 | 3,810 | 3.10 | 2,350 | 6.05 | 1,330 |
| 11 | 7.53 | 15,985 | 7.25 | 14,725 | 5.15 | 6,500 | 4.02 | 3,690 | 7.07 | 2,250*f* | 5.90 | 1,335 |
| 12 | 7.48 | 15,760 | 7.12 | 14,140 | 4.93 | 5,858 | 4.00 | 3,650 | 8.20 | 2,120 | 5.70 | 1,330 |
| 13 | 8.80 | 17,200 | 7.10 | 14,050 | 4.97 | 5,967 | 4.05 | 3,750 | 8.00 | 2,018 | 5.55 | 1,325 |
| 14 | 11.05 | 35,100 | 7.18 | 14,410 | 4.87 | 5,692 | 3.92 | 3,510 | 7.70 | 1,945 | 5.50 | 1,320 |
| 15 | 9.85 | 27,900 | 7.15*d* | 14,275 | 4.87 | 5,692 | 3.82 | 3,335 | 7.45 | 1,895 | 5.40 | 1,330 |
| 16 | 10.00 | 28,800 | 7.20 | 14,500 | 4.80 | 5,500 | 3.82 | 3,335 | 6.75 | 1,820 | 5.25 | 1,310 |
| 17 | 11.25 | 36,325 | 7.30 | 14,950 | 4.77 | 5,425 | 3.82 | 3,335 | 6.35 | 1,750 | 5.05 | 1,310 |
| 18 | 10.65 | 32,700 | 7.37 | 15,265 | 4.80 | 5,500 | 3.85 | 3,388 | 6.45 | 1,680 | 4.95 | 1,345 |
| 19 | 9.62 | 26,610 | 8.15 | 18,850 | 4.83 | 5,583 | 3.82 | 3,335 | 6.15 | 1,460 | 5.20 | 1,390 |
| 20 | 9.25 | 24,575 | 9.00 | 23,200 | 4.87 | 5,692 | 3.85 | 3,388 | 6.00 | 1,410 | 5.35 | 1,425 |
| 21 | 8.85 | 22,375 | 9.75 | 27,325 | 4.87 | 5,692 | 3.88 | 3,440 | 6.00 | 1,390 | 5.50 | 1,435 |
| 22 | 8.65 | 21,350 | 9.15 | 24,025 | 4.77 | 5,425 | 3.82 | 3,335 | 5.95 | 1,380 | 5.65 | 1,415 |
| 23 | 8.52 | 20,700 | 8.05 | 18,350 | 4.77 | 5,425 | 3.80 | 3,300 | 6.00 | 1,370 | 5.60 | 1,395 |
| 24 | 8.18 | 19,000 | 7.85 | 17,425 | 4.75 | 5,375 | 3.78 | 3,270 | 6.10 | 1,360 | 5.50 | 1,410 |
| 25 | 7.82 | 17,290 | 7.70 | 16,750 | 4.67 | 5,175 | 3.78 | 3,270 | 5.90 | 1,350 | 5.65 | 1,420 |
| 26 | 7.70 | 16,750 | 7.50 | 15,850 | 4.67 | 5,175 | 3.70 | 3,150 | 5.35 | 1,340 | 5.55 | 1,420 |
| 27 | 7.58 | 16,210 | 7.33 | 15,085 | 4.63 | 5,075 | 3.72 | 3,180 | 6.10 | 1,340 | 5.40 | 1,410 |
| 28 | 7.48 | 15,760 | 7.17 | 14,365 | 4.53 | 4,825 | 3.75 | 3,225 | 5.60 | 1,350 | 5.40 | 1,410 |
| 29 | 8.05 | 18,350 | 7.00 | 13,600 | 4.47 | 4,675 | 3.72 | 3,180 | 5.80 | 1,365 | 5.35 | 1,410 |
| 30 | 7.75 | 16,975 | 7.07 | 13,915 | 4.45 | 4,625 | 3.70 | 3,150 | 5.45 | 1,355 | 5.20 | 1,415 |
| 31 | 7.90 | 17,650 | 7.05 | 13,825 | ..... | ..... | 3.68 | 3,120 | ..... | ..... | 5.25 | 1,425*f* |

*c* to *c* Gauge heights interpolated.
*d* Temporary gauge installed at cable section.
*e* New gauge placed and gauge heights June 28 to Oct. 8 reduced to datum of new gauge.
*f* to *f* Ice conditions.

MONTHLY DISCHARGE of North Saskatchewan River near Rocky Mountain House, for 1915.

(Drainage area 4,050 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile | Depth in inches on Drainage Area | Total in Acre-feet |
| January | 875 | 785 | 833 | 0.206 | 0.238 | 51,219 |
| February | 798 | 695 | 751 | 0.185 | 0.193 | 41,7[illegible] |
| March | 847 | 627 | 681 | 0.168 | 0.194 | 41,87[illegible] |
| April | 1,827 | 850 | 1,451 | 0.358 | 0.399 | 86,34[illegible] |
| May | 9,052 | 2,052 | 5,934 | 1.465 | 1.689 | 364,868 |
| June | 129,700 | 7,180 | 22,894 | 5.653 | 6.307 | 1,362,24[illegible] |
| July | 36,325 | 15,760 | 22,562 | 5.571 | 6.423 | 1,387,282 |
| August | 27,325 | 13,600 | 16,753 | 4.137 | 4.7[illegible] | 1,030,[illegible] |
| September | 12,400 | 4,625 | 6,984 | 1.724 | 1.919 | 414,38[illegible] |
| October | 4,925 | 3,120 | 3,680 | 0.910 | 1.048 | 2[illegible],642 |
| November | 3,030 | 1,340 | 1,994 | 0.492 | 0.549 | 118,6[illegible] |
| December | 1,435 | 1,310 | 1,364 | 0.337 | 0.388 | 83,8[illegible] |
| The year | | | | | 24.117 | 5,2[illegible],188 |

SOUTHESK RIVER.

*Location.*—Tp. 43, Rge. 20, W. 5th Mer., about five miles above mouth of stream. at Forestry ford.

*Records available.*—Discharge measurements only.

*Gauge.*—None established.

*Bench-mark.*—Standard wooden. Located on the left bank about 50 feet downstream from trail. Assumed elevation, 100.00 feet.

*Channel.*—Fairly permanent, consisting of sand, gravel and rock.

*Discharge measurements.*—Made from a temporary cable.

*Winter flow.*—Stream affected by ice from November to May.

*Floods.*—During June, 1915, stream was in a violent state of flood but did not overflow its banks. An elevation of 94.81 feet relative to bench-mark was reached. The slope method gives a corresponding discharge of 3,835 sec.-ft.

*Observer.*—None obtainable.

DISCHARGE MEASUREMENTS of Southesk River in Tp. 43, Rge. 20, W. 5th Mer., in 1916.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| June 27 | O. H. Hoover | 103 | 510.3 | 7.52 | 94.81*b* | 3,835*a* |
| Sept. 2 | do | 72 | 105.0 | 4.40 | 91.05*b* | 462 |

*a* Slope measurement.
*b* Water surface elevation.

SOUTH BRANCH OF BRAZEAU RIVER.

*Location.*—Tp. 43, Rge. 16, W. 5th Mer., about one-half mile above mouth of Chungo Creek.

*Records available.*—Discharge measurements only.

*Gauge.*—None established.

*Bench-mark.*—Standard wooden. Located on the left bank, 60 feet from water edge, and 30 feet upstream from gauging section. Assumed elevation, 100.00 feet.

*Channel.*—Shifting, consisting of sand and gravel.

*Discharge measurements.*—Made by wading or from a temporary cable.

*Winter flow.*—Stream affected by ice from November to May.

*Floods.*—During June, 1915, stream was in a violent state of flood, overflowing its banks and reaching a gauge height elevation of 100.95 feet relative to bench-mark. The slope method gives a corresponding maximum discharge of 30,424 sec.-ft.

*Observer.*—None obtainable.

DISCHARGE MEASUREMENTS of South Branch Brazeau River in Tp. 43, Rge. 16, W. 5th Mer., in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| June 27 | O. H. Hoover | 198 | 2130.2 | 14.28 | 100.95*b* | 30,424*a* |
| Aug. 27 | do | 134 | 170.0 | 1.95 | 94.57*b* | 331 |

*a* Slope measurement.
*b* Water surface elevation.

CHUNGO CREEK.

*Location.*—Tp. 43, Rge. 17, W. 5th Mer., about 500 feet above stream mouth.

*Records available.*—Discharge measurements only.

*Gauge.*—None established.

*Bench-mark.*—Standard wooden. Located on the right bank about 30 feet from water edge, and on a line with measuring section. Assumed elevation, 100.00 feet.

*Channel.*—Fairly permanent, consisting of sand, gravel and rock.

*Discharge measurements.*—Made by wading.

*Winter flow.*—Stream affected by ice from November to May.

*Floods.*—During June, 1915, stream was in a violent state of flood but did not overflow its banks. A maximum elevation of 95.41 feet relative to bench-mark was reached. The slope method gives a corresponding discharge of 9,351 sec.-ft.

*Observer.*—None obtainable.

PLATE 7

Brazeau River in Sec. 34, Tp. 44, Rge. 15, West 5th Meridian. (Note the high water marks.) Taken on September 1, 1915, by O. H. Hoover.

PLATE 8

Flood debris and large gravel wash on Brazeau River, in Sec. 34, Tp. 44, Rge. 15, West 5th Meridian. Taken on August 24, 1915, by O. H. Hoover.

DISCHARGE MEASUREMENTS of Chungo Creek in Tp. 43, Rge. 17, W. 5th Mer., in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| June 27 | O. H. Hoover | 101.0 | 843.7 | 11.07 | 95.41*b* | 9,351*a* |
| Aug. 26 | do | 41.2 | 57.6 | 1.20 | 86.78*b* | 69 |

*a* Slope measurement.
*b* Water surface elevation.

BROWN CREEK.

*Location.*—Tp. 44, Rge. 17, W. 5th Mer., about five miles above stream mouth near Forestry ford.

*Records available.*—Discharge measurements only.

*Gauge.*—None established.

*Bench-mark.*—Standard wooden. Located on the left bank, 50 feet below gauging section. Assumed elevation, 100.00 feet.

*Channel.*—Fairly permanent, consisting of sand, gravel and rock.

*Discharge measurements.*—Made by wading.

*Winter flow.*—Stream affected by ice from November to May.

*Floods.*—During June, 1915, stream was in a violent state of flood but did not overflow its banks. A maximum elevation of 95.58 feet relative to bench-mark was reached. The slope method gives a corresponding discharge of 11,982 sec.-ft.

*Observer.*—None obtainable.

DISCHARGE MEASUREMENTS of Brown Creek in Tp. 44, Rge. 17, W. 5th Mer., in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| June 27 | O. H. Hoover | 143.0 | 881.0 | 13.60 | 95.58*b* | 11,982*a* |
| Aug. 28 | do | 59.5 | 47.8 | 0.88 | 88.94*b* | 42 |

*a* Slope measurement.
*b* Water surface elevation.

NORTH SASKATCHEWAN RIVER AT ROCKY RAPIDS.

*Location.*—On the NE. ¼ Sec. 10, Tp. 49, Rge. 7, W. 5th Mer.,

*Records available.*—Data supplied by Sir John Jackson (Canada) Company, Limited, from June 10, 1913, to May 2, 1914. Records by this office, January 1, 1915, December 31, 1915.

*Gauge.*—Vertical staff on left bank. Zero elevation unintained at 88.30 feet from November 15, to December 31, 1915.

*Bench-mark.*—On five-inch spike in stump near gauge. Assumed elevation, 100.00 feet.

*Maximum stage.*—June 27, 1915, with gauge height of 26.86 feet.

*Accuracy.*—The records given herewith are based on those of the Sir John Jackson (Canada) Company, Limited, and our records at Edmonton. In using these records, therefore, it should be borne in mind that they are only estimates based on very meagre information.

*Observer.*—W. H. Kew.

*Note.*—The cable constructed by the Sir John Jackson (Canada) Company as well as all equipment installed by this office were destroyed in the June-July floods of 1915. A new cable station with complete equipment is being established early in 1916 and complete records will be obtained throughout the year.

DISCHARGE MEASUREMENTS of North Saskatchewan River at Rocky Rapids, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 20 | H. B. R. Thompson | 277 | 1,076 | 1.26 | ..... | 1,364 |
| Jan. 21 | do | 277 | 1,076 | 1.25 | ..... | 1,347 |
| Mar. 8 | do | 255 | 870 | 1.26 | ..... | 1,093 |
| Mar. 9 | do | 255 | 870 | 1.27 | ..... | 1,100 |
| Dec. 21 | J. M. Paul | 416 | 2,513 | 0.62 | 5.50 | 1,559 |

DAILY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River at Rocky Rapids, for 1915.

| DAY. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | 1,300 | ..... | 1,300 | ..... | 1,100 | ..... | 2,400 | ..... | 3,700 | ..... | 19,100 |
| 2 | ..... | 1,300 | ..... | 1,300 | ..... | 1,100 | ..... | 2,500 | ..... | 3,700 | ..... | 23,000 |
| 3 | ..... | 1,300 | ..... | 1,200 | ..... | 1,100 | ..... | 2,800 | ..... | 4,100 | ..... | 40,000 |
| 4 | ..... | 1,350 | ..... | 1,200 | ..... | 1,100 | ..... | 3,000 | ..... | 4,000 | ..... | 37,000 |
| 5 | ..... | 1,300 | ..... | 1,200 | ..... | 1,100 | ..... | 3,500 | ..... | 4,600 | ..... | 29,000 |
| 6 | ..... | 1,300 | ..... | 1,300 | ..... | 1,100 | ..... | 3,900 | ..... | 5,900 | ..... | 24,200 |
| 7 | ..... | 1,250 | ..... | 1,300 | ..... | 1,050 | ..... | 4,300 | ..... | 6,200 | ..... | 21,500 |
| 8 | ..... | 1,250 | ..... | 1,300 | ..... | 1,090 | ..... | 4,900 | ..... | 6,800 | ..... | 22,500 |
| 9 | ..... | 1,300 | ..... | 1,300 | ..... | 1,100 | ..... | 4,700 | ..... | 7,500 | ..... | 44,000 |
| 10 | ..... | 1,300 | ..... | 1,200 | ..... | 1,100 | ..... | 3,500 | ..... | 8,500 | ..... | 40,000 |
| 11 | ..... | 1,200 | ..... | 1,200 | ..... | 1,200 | ..... | 3,500 | ..... | 9,000 | ..... | 36,100 |
| 12 | ..... | 1,200 | ..... | 1,200 | ..... | 1,200 | ..... | 3,500 | ..... | 9,000 | ..... | 32,700 |
| 13 | ..... | 1,200 | ..... | 1,300 | ..... | 1,300 | ..... | 3,300 | ..... | 8,200 | ..... | 29,500 |
| 14 | ..... | 1,200 | ..... | 1,200 | ..... | 1,400 | ..... | 3,300 | ..... | 7,500 | ..... | 26,800 |
| 15 | ..... | 1,200 | ..... | 1,200 | ..... | 1,400 | ..... | 3,300 | ..... | 9,600 | ..... | 25,400 |
| 16 | ..... | 1,200 | ..... | 1,200 | ..... | 1,400 | ..... | 3,200 | ..... | 11,300 | ..... | 23,100 |
| 17 | ..... | 1,250 | ..... | 1,200 | ..... | 1,400 | ..... | 3,200 | ..... | 11,400 | ..... | 30,000 |
| 18 | ..... | 1,300 | ..... | 1,100 | ..... | 1,500 | ..... | 3,200 | ..... | 9,700 | ..... | 34,500 |
| 19 | ..... | 1,350 | ..... | 1,200 | ..... | 1,550 | ..... | 3,200 | ..... | 9,000 | ..... | 31,000 |
| 20 | ..... | 1,360 | ..... | 1,200 | ..... | 1,650 | ..... | 3,500 | ..... | 8,700 | ..... | 28,700 |
| 21 | ..... | 1,350 | ..... | 1,200 | ..... | 1,800 | ..... | 3,600 | ..... | 8,500 | ..... | 25,700 |
| 22 | ..... | 1,300 | ..... | 1,200 | ..... | 2,000 | ..... | 3,800 | ..... | 9,000 | ..... | 25,000 |
| 23 | ..... | 1,300 | ..... | 1,200 | ..... | 2,100 | ..... | 3,900 | ..... | 9,800 | ..... | 24,200 |
| 24 | ..... | 1,200 | ..... | 1,150 | ..... | 2,150 | ..... | 3,800 | ..... | 10,900 | ..... | 25,600 |
| 25 | ..... | 1,300 | ..... | 1,150 | ..... | 2,150 | ..... | 3,800 | ..... | 12,300 | ..... | 26,500 |
| 26 | ..... | 1,300 | ..... | 1,150 | ..... | 2,100 | ..... | 3,800 | ..... | 14,200 | ..... | 55,400 |
| 27 | ..... | 1,300 | ..... | 1,100 | ..... | 2,200 | ..... | 3,800 | ..... | 15,000 | ..... | 190,500 |
| 28 | ..... | 1,100 | ..... | 1,100 | ..... | 2,200 | ..... | 3,800 | ..... | 13,000 | ..... | 177,700 |
| 29 | ..... | 1,100 | ..... | ..... | ..... | 2,300 | ..... | 3,700 | ..... | 15,000 | ..... | 93,800 |
| 30 | ..... | 1,100 | ..... | ..... | ..... | 2,350 | ..... | 3,700 | ..... | 16,000 | ..... | 64,000 |
| 31 | ..... | 1,200 | ..... | ..... | ..... | 2,350 | ..... | ..... | ..... | 23,000 | ..... | ..... |

NOTE.—Estimated from discharges at Edmonton.

DAILY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River at Rocky Rapids, for 1915. —*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | 50,000*a* | 6.89 | 28,675 | 5.88 | 21,360 | 3.14 | 6,950 | 1.98 | 4,570 | 4.41 | 2,320 |
| 2 | ..... | 45,000 | 6.93 | 28,975 | 5.38 | 18,170 | 3.27 | 7,345 | 1.83 | 4,345 | 4.45 | 2,320 |
| 3 | ..... | 44,500 | 6.73 | 27,475 | 5.23 | 17,195 | 3.35 | 7,625 | 1.72 | 4,220 | 4.68 | 2,320 |
| 4 | ..... | 41,500 | 6.88 | 28,670 | 5.10 | 16,350 | 3.33 | 7,555 | 1.69 | 4,190 | 4.75 | 2,275 |
| 5 | ..... | 40,700 | 7.03 | 29,725 | 5.18 | 16,870 | 3.31 | 7,485 | 1.67 | 4,170 | 4.90 | 2,195 |
| 6 | ..... | 40,400 | 6.33 | 24,510 | 5.13 | 16,545 | 3.16 | 7,000 | 1.66 | 4,160 | 5.09 | 2,180 |
| 7 | ..... | 41,300 | 5.93 | 21,745 | 5.10 | 16,350 | 3.10 | 6,825 | 1.65 | 4,150*b* | 5.18 | 2,170 |
| 8 | ..... | 41,800 | 5.99 | 22,135 | 4.78 | 14,390 | 3.06 | 6,750 | 2.68 | 3,820*c* | 5.20 | 2,100 |
| 9 | ..... | 39,000 | 5.98 | 22,070 | 4.68 | 13,840 | 3.03 | 6,675 | 3.78 | 3,525 | 5.18 | 1,990 |
| 10 | ..... | 38,600 | 5.80 | 20,900 | 4.48 | 12,740 | 2.73 | 5,960 | 2.27 | 3,150 | 5.22 | 1,860 |
| 11 | ..... | 38,000 | 5.57 | 19,405 | 4.23 | 11,450 | 2.63 | 5,760 | 2.48 | 3,085 | 5.22 | 1,805 |
| 12 | ..... | 34,000 | 5.51 | 19,015 | 4.00 | 10,300 | 2.60 | 5,700 | 4.12 | 3,070 | 5.18 | 1,800 |
| 13 | ..... | 35,500 | 5.46 | 18,690 | 3.73 | 9,020 | 2.52 | 5,540 | 4.08 | 3,030 | 5.16 | 1,800 |
| 14 | ..... | 38,000 | 5.39 | 18,235 | 3.58 | 8,430 | 2.49 | 5,480 | 4.55 | 3,000 | 5.17 | 1,800 |
| 15 | ..... | 94,200*a* | 5.32 | 17,780 | 3.47 | 8,045 | 2.43 | 5,360 | 4.46 | 2,990 | 5.21 | 1,770 |
| 16 | 14.43 | 90,670*b* | 5.47 | 18,755 | 3.50 | 8,150 | 2.37 | 5,240 | 4.50 | 2,960 | 5.37 | 1,730 |
| 17 | 11.84 | 67,740 | 5.41 | 18,365 | 3.58 | 8,430 | 2.31 | 5,120 | 4.54 | 2,900 | 5.45 | 1,700 |
| 18 | 11.93 | 68,505 | 5.39 | 18,235 | 3.50 | 8,150 | 2.28 | 5,060 | 4.77 | 2,800 | 5.60 | 1,680 |
| 19 | 11.03 | 61,040 | 7.53 | 33,475 | 3.60 | 8,500 | 2.30 | 5,100 | 4.70 | 2,755 | 5.74 | 1,660 |
| 20 | 10.13 | 53,840 | 6.93 | 28,975 | 3.53 | 8,355 | 2.33 | 5,160 | 4.78 | 2,720 | 5.62 | 1,640 |
| 21 | 9.58 | 49,440 | 8.68 | 42,240 | 3.58 | 8,430 | 2.35 | 5,200 | 4.72 | 2,715 | 5.50 | 1,560 |
| 22 | 8.93 | 44,240 | 8.08 | 37,600 | 3.50 | 8,150 | 2.30 | 5,100 | 4.77 | 2,700 | 5.67 | 1,520 |
| 23 | 8.58 | 41,440 | 7.09 | 30,175 | 3.33 | 7,555 | 2.25 | 5,000 | 4.64 | 2,680 | 5.63 | 1,500 |
| 24 | 8.33 | 39,475 | 6.68 | 27,100 | 3.33 | 7,555 | 2.23 | 4,960 | 4.76 | 2,575 | 5.72 | 1,480 |
| 25 | 7.54 | 33,550 | 6.59 | 26,425 | 3.43 | 7,905 | 2.15 | 4,825 | 4.74 | 2,480 | 5.80 | 1,470 |
| 26 | 7.23 | 31,225 | 6.36 | 24,720 | 3.28 | 7,380 | 2.10 | 4,750 | 4.85 | 2,410 | 5.88 | 1,460 |
| 27 | 6.98 | 29,350 | 6.13 | 23,145 | 3.18 | 7,030 | 2.10 | 4,750 | 4.76 | 2,350 | 5.90 | 1,450 |
| 28 | 6.58 | 26,350 | 5.99 | 22,135 | 3.13 | 6,925 | 2.10 | 4,750 | 4.62 | 2,315 | 5.95 | 1,440 |
| 29 | 6.38 | 24,860 | 5.68 | 20,120 | 3.08 | 6,800 | 2.10 | 4,750 | 4.65 | 2,310 | 5.95 | 1,430 |
| 30 | 6.98 | 29,350 | 5.63 | 19,795 | 3.08 | 6,800 | 2.10 | 4,750 | 4.50 | 2,315 | 5.90 | 1,420 |
| 31 | 6.78 | 27,850 | 5.93 | 21,745 | ..... | ..... | 2.07 | 4,705 | ..... | ..... | 5.94 | 1,410*c* |

*a* to *a* Estimated from discharges at Edmonton.
*b* to *b* Estimated from gauge heights taken by W. H. Kew.
*c* to *c* Ice conditions.

MONTHLY DISCHARGE of North Saskatchewan River at Rocky Rapids, for 1915.

(Drainage area 8,230 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 1,360 | 1,100 | 1,257 | 0.153 | 0.18 | 77,290 |
| February | 1,300 | 1,100 | 1,209 | 0.147 | 0.15 | 67,145 |
| March | 2,350 | 1,050 | 1,569 | 0.191 | 0.22 | 96,474 |
| April | 4,900 | 2,400 | 3,547 | 0.431 | 0.48 | 211,061 |
| May | 23,000 | 3,700 | 9,519 | 1.157 | 1.33 | 585,300 |
| June | 190,500 | 19,100 | 43,550 | 5.292 | 5.90 | 2,591,405 |
| July | 94,200 | 24,860 | 41,094 | 4.993 | 5.76 | 2,526,772 |
| August | 42,240 | 17,780 | 24,549 | 2.983 | 3.44 | 1,509,459 |
| September | 21,360 | 6,800 | 10,906 | 1.325 | 1.48 | 648,952 |
| October | 7,625 | 4,705 | 5,717 | 0.695 | 0.80 | 351,524 |
| November | 4,570 | 2,310 | 3,149 | 0.383 | 0.43 | 187,379 |
| December | 2,320 | 1,410 | 1,782 | 0.216 | 0.25 | 109,571 |
| The year | ..... | ..... | ..... | ..... | 20.42 | 8,962,332 |

NORTH SASKATCHEWAN RIVER AT EDMONTON.

*Location.*—On river lot No. 17, NW. ¼ Sec. 33, Tp. 52, Rge. 24, W. 4th Mer., at the low level traffic and railway bridge in the city of Edmonton.

*Records available.*—May 1, 1911, to December 31, 1915.

*Gauges.*—Two vertical staff gauges at this station, a low level gauge reading from 0 to 10 feet and a high level gauge reading from 10 to 34 feet. The high level gauge is spiked to a timber pier a short distance above the mill of the Edmonton Lumber Company, the low level gauge being attached to a pier about 75 feet above the other and 200 feet from the right bank of the river. Zero elevation of low level gauge maintained at 1,991.73 feet during 1911. Zero elevation of low level gauge maintained at 1,991.09 feet during 1912 and up to June 28, 1915. Zero elevation of high level gauge maintained at 1,995.67 feet during 1911–1912. Zero elevation of high level gauge maintained at 1,991.09 feet during 1913 and up to June 28, 1915. On June 28, 1915, both gauges were swept away by the flood and a temporary gauge was used until July 16 when a chain gauge was installed on the downstream side of the bridge between the third and fourth piers. The zero elevation of the chain gauge has since been maintained at 1,991.09 feet. On November 6 a staff gauge for winter use was fastened to the pier to which the old gauges were attached. This gauge is also at a zero elevation of 1,991.09 feet.

*Bench-mark.*—Permanent iron bench-mark on the right bank, close to the Edmonton Lumber Company's fence and 10 feet below the right hand abutment of the bridge. Elevation, 2,037.33 feet. (Department of Public Works of Canada datum.)

*Channel.*—One, slightly shifting at all stages.

*Discharge measurements.*—Made from a bridge.

*Floods.*—Up to 1915 the largest flood upon record took place in August, 1899, followed by another one, not quite so large in 1900. On both occasions considerable damage was done but no actual figures are available. On June 28, 1915, the water rose to a gauge height of 45.04 feet, which, as near as can be found, is some four feet higher than the high water mark of 1899. At a gauge height of about 35 feet the river overflowed the flats along the bank. Probably 2,000 people were rendered homeless and the loss to property is estimated at about $750,000. The damage done to sidewalks, roads, and other city property is given at about $17,500.00.

*Observer.*—Edmonton Lumber Company, per W. H. Schneider.

DISCHARGE MEASUREMENTS of North Saskatchewan River at Edmonton, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-f.* |
| Jan. 2 | P. H. Daniells | 330*a* | 2,061 | 0.61 | 7.98 | 1,255 |
| Jan. 22 and 23 | R. J. McGuinness | 318*a* | 1,823 | 0.61 | 7.96 | 1,128 |
| Feb. 14 | do | 318*a* | 1,803 | 0.62 | 8.10 | 1,090 |
| Mar. 26 | J. M. Paul | 318*a* | 2,069 | 1.11 | 8.99 | 2,306 |
| April 10 | I. R. Strome | 414 | 2,384 | 1.42 | 8.93 | 4,377 |
| April 28 | do | 406 | 2,084 | 1.68 | 8.46 | 3,506 |
| May 17 | do | 550 | 3,708 | 2.90 | 11.54 | 10,762 |
| June 7 | do | 574 | 5,593 | 3.80 | 14.72 | 21,253 |
| June 23 | G. H. Whyte and I. R. Strome | 577 | 5,882 | 3.66 | 14.93 | 21,651 |
| June 27 | I. R. Strome | 612 | 11,127 | 6.03 | 24.20 | 67,133 |
| June 28 | do | 649 | 20,870 | 7.78 | 39.50 | 162,583 |
| June 30 | do | 631 | 12,993 | 5.97 | 26.72 | 77,538 |
| July 16 | do | 631 | 14,407 | 6.28 | 28.96*b* | 90,469 |
| July 28 | do | 594 | 7,374 | 3.86 | 17.12 | 28,445 |
| Aug. 27 | do | 591 | 5,941 | 3.65 | 15.63 | 21,680 |
| Sept. 17 | do | 543 | 3,526 | 2.24 | 11.08 | 7,901 |
| Oct. 2 | do | 500 | 3,441 | 2.01 | 10.42 | 6,920 |
| Oct. 20 | do | 484 | 2,935 | 1.75 | 9.70 | 5,145 |
| Nov. 6 | do | 422 | 2,488 | 1.42 | 8.92 | 3,539 |
| Nov. 29 | J. M. Paul | 375*a* | 2,564 | 0.87 | 9.07 | 2,232 |
| Dec. 24 | I. R. Strome | 353*a* | 2,106 | 0.67 | 8.62 | 1,414 |

*a* Ice conditions.
*b* Chain gauge installed on bridge, and used until freeze-up.

North Saskatchewan River in flood at Edmonton, on August 19, 1899. General view looking west from road to low level traffic bridge. Copyright photograph published by permission from the owner, Ernest Brown, Limited, Edmonton, Alberta.

DAILY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River at Edmonton, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 8.0 | 1,250*a* | 8.0 | 1,070 | 8.0 | 1,115 | 8.0 | 2,220 | 8.3 | 3,280 | 14.5 | 20,240 |
| 2 | 8.0 | 1,250 | 8.0 | 1,110 | 8.0 | 1,125 | 8.0 | 2,300 | 8.4 | 3,440 | 13.7 | 17,420 |
| 3 | 8.0 | 1,330 | 7.9 | 1,115 | 8.0 | 1,130 | 8.0 | 2,450 | 8.5 | 3,610 | 14.6 | 20,600 |
| 4 | 8.0 | 1,350 | 7.9 | 1,090 | 8.0 | 1,145 | 8.1 | 2,590 | 8.7 | 3,950 | 18.6 | 37,580 |
| 5 | 8.0 | 1,350 | 7.9 | 1,065 | 8.0 | 1,160 | 8.2 | 2,760 | 8.6 | 3,780 | 17.8 | 33,900 |
| 6 | 7.9 | 1,350 | 8.0 | 1,060 | 8.0 | 1,175 | 8.3 | 3,280 | 8.9 | 4,310 | 16.0 | 26,120 |
| 7 | 7.9 | 1,335 | 8.0 | 1,105 | 8.0 | 1,190 | 8.6 | 3,780*a* | 9.6 | 5,720 | 15.0 | 22,080 |
| 8 | 8.0 | 1,290 | 8.0 | 1,120 | 8.0 | 1,210 | 10.2 | 4,240*b* | 9.8 | 6,160 | 14.3 | 19,520 |
| 9 | 8.0 | 1,300 | 8.0 | 1,115 | 8.0 | 1,230 | 9.1 | 4,700*c* | 10.0 | 6,620 | 14.6 | 20,600 |
| 10 | 7.9 | 1,330 | 8.0 | 1,090 | 8.0 | 1,260 | 9.0 | 4,500 | 10.3 | 7,340 | 19.2 | 40,420 |
| 11 | 7.8 | 1,320 | 8.0 | 1,070 | 8.0 | 1,310 | 8.4 | 3,440 | 10.6 | 8,100 | 18.6 | 37,580 |
| 12 | 7.8 | 1,275 | 8.0 | 1,060 | 8.0 | 1,345 | 8.4 | 3,440 | 10.8 | 8,620 | 17.6 | 32,980 |
| 13 | 7.9 | 1,210 | 8.0 | 1,070 | 8.0 | 1,390 | 8.4 | 3,440 | 10.8 | 8,620 | 17.0 | 30,320 |
| 14 | 7.9 | 1,195 | 8.0 | 1,090 | 8.0 | 1,425 | 8.2 | 3,120 | 10.5 | 7,840 | 16.3 | 27,380 |
| 15 | 7.9 | 1,200 | 8.1 | 1,075 | 8.0 | 1,480 | 8.2 | 3,120 | 10.2 | 7,100 | 15.7 | 24,880 |
| 16 | 7.9 | 1,230 | 8.0 | 1,070 | 8.0 | 1,550 | 8.2 | 3,120 | 11.0 | 9,140 | 15.3 | 23,280 |
| 17 | 7.9 | 1,275 | 8.0 | 1,055 | 8.0 | 1,610 | 8.1 | 2,980 | 11.5 | 10,510 | 15.2 | 22,880 |
| 18 | 7.9 | 1,305 | 8.0 | 1,050 | 8.1 | 1,680 | 8.1 | 2,980 | 11.5 | 10,510 | 16.2 | 26,960 |
| 19 | 7.9 | 1,315 | 8.0 | 1,040 | 8.3 | 1,790 | 8.1 | 2,980 | 11.0 | 9,140 | 17.1 | 30,760 |
| 20 | 7.9 | 1,280 | 8.0 | 1,045 | 8.4 | 1,890 | 8.1 | 2,980 | 10.8 | 8,620 | 16.5 | 28,220 |
| 21 | 7.9 | 1,220 | 8.0 | 1,055 | 8.6 | 2,040 | 8.2 | 3,120 | 10.7 | 8,360 | 15.9 | 25,700 |
| 22 | 7.9 | 1,160 | 8.0 | 1,060 | 9.0 | 2,170 | 8.3 | 3,280 | 10.6 | 8,100 | 15.4 | 23,680 |
| 23 | 7.9 | 1,140 | 8.0 | 1,065 | 9.5 | 2,280 | 8.5 | 3,610 | 10.8 | 8,620 | 15.1 | 22,480 |
| 24 | 8.0 | 1,120 | 8.0 | 1,075 | 9.6 | 2,420 | 8.6 | 3,780 | 11.0 | 9,140 | 15.0 | 22,080 |
| 25 | 8.0 | 1,100 | 8.0 | 1,090 | 9.2 | 2,420 | 8.5 | 3,610 | 11.4 | 10,220 | 15.3 | 23,280 |
| 26 | 7.9 | 1,110 | 8.0 | 1,095 | 9.0 | 2,310 | 8.5 | 3,610 | 11.8 | 11,390 | 15.5 | 24,080 |
| 27 | 7.9 | 1,140 | 8.0 | 1,100 | 8.9 | 2,270 | 8.5 | 3,610 | 12.3 | 12,900 | 21.5 | 52,200 |
| 28 | 7.9 | 1,125 | 8.0 | 1,110 | 8.8 | 2,230 | 8.5 | 3,610 | 12.6 | 13,830 | 42.4 | 185,560 |
| 29 | 8.0 | 1,030 | ..... | ..... | 8.6 | 2,210 | 8.5 | 3,610 | 12.0 | 11,990 | 41.1 | 173,780 |
| 30 | 8.0 | 1,010 | ..... | ..... | 8.2 | 2,210 | 8.4 | 3,440 | 12.6 | 13,830 | 27.5 | 81,900 |
| 31 | 8.0 | 1,030 | ..... | ..... | 8.2 | 2,205 | ..... | ..... | 12.9 | 14,780 | ..... | ..... |

*a* Ice conditions Jan. 1 to April 7.
*b* Ice jam; discharge interpolated on April 8.
*c* Open water April 9 to Nov. 9.
Curve No. 1 April 9 to June 28; curve No. 2 June 29 to Nov. 9.

DAILY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River at Edmonton, for 1915.

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 23.9 | 61,260 | 17.0 | 27,500 | 14.6 | 18,260 | 10.5 | 6,690 | 9.4 | 4,450 | 8.5 | 2,260 |
| 2 | 20.9 | 45,500 | 17.0 | 27,500 | 14.7 | 18,600 | 10.4 | 6,470 | 9.3 | 4,270 | 8.6 | 2,270 |
| 3 | 19.7 | 39,560 | 16.8 | 26,670 | 14.1 | 16,560 | 10.7 | 7,130 | 9.3 | 4,270 | 8.5 | 2,280 |
| 4 | 19.6 | 39,080 | 16.7 | 26,260 | 13.6 | 14,960 | 10.9 | 7,590 | 9.1 | 3,910 | 8.5 | 2,230 |
| 5 | 19.3 | 37,680 | 17.0 | 27,500 | 13.6 | 14,960 | 11.0 | 7,830 | 9.1 | 3,910 | 8.4 | 2,100 |
| 6 | 19.1 | 36,760 | 17.1 | 27,920 | 13.7 | 15,280 | 11.1 | 8,070 | 8.9 | 3,550 | 8.3 | 2,120 |
| 7 | 19.0 | 36,300 | 16.2 | 24,260 | 13.3 | 14,020 | 10.8 | 7,350 | 9.0 | 3,730 | 8.5 | 2,130 |
| 8 | 19.2 | 37,220 | 16.0 | 23,480 | 13.1 | 13,420 | 10.6 | 6,910 | 9.0 | 3,730 | 8.8 | 2,020 |
| 9 | 19.3 | 37,680 | 15.8 | 22,700 | 13.0 | 13,120 | 10.4 | 6,470 | 8.7 | 3,200*c* | 9.0 | 1,900 |
| 10 | 18.7 | 34,950 | 15.7 | 22,310 | 12.2 | 10,850 | 10.3 | 6,250 | 11.9 | 3,000*d* | 9.1 | 1,800 |
| 11 | 18.7 | 34,950 | 15.6 | 21,920 | 12.0 | 10,310 | 10.1 | 5,830 | 12.5 | 2,970 | 9.1 | 1,760 |
| 12 | 18.5 | 34,050 | 15.5 | 21,530 | 11.8 | 9,790 | 10.1 | 5,830 | 10.3 | 2,900*d* | 8.9 | 1,760 |
| 13 | 17.7 | 30,480 | 15.3 | 20,790 | 11.5 | 9,030 | 10.0 | 5,630 | 9.9 | 2,850*e* | 8.8 | 1,770 |
| 14 | 17.9 | 31,360 | 15.2 | 20,420 | 11.3 | 8,550 | 9.9 | 5,430 | 9.8 | 2,870 | 8.8 | 1,775 |
| 15 | 18.5 | 34,050 | 15.1 | 20,050 | 11.2 | 8,310 | 9.7 | 5,030 | 9.7 | 2,900 | 8.6 | 1,730 |
| 16 | 28.9 | 90,200 | 15.0 | 19,680 | 11.2 | 8,310 | 9.8 | 5,230 | 9.6 | 2,900 | 8.5 | 1,680 |
| 17 | 27.6 | 82,480 | 15.1 | 20,050 | 11.0 | 7,830 | 9.7 | 5,030 | 9.9 | 2,810 | 8.4 | 1,640 |
| 18 | 25.6 | 70,880 | 15.6 | 21,920 | 11.1 | 8,070 | 9.7 | 5,030 | 10.3 | 2,750 | 8.3 | 1,625 |
| 19 | 25.1 | 67,980 | 15.2 | 20,420 | 10.9 | 7,590 | 9.7 | 5,030 | 10.4 | 2,670 | 8.4 | 1,600 |
| 20 | 23.2 | 57,480 | 16.2 | 24,260 | 10.9 | 7,590 | 9.7 | 5,030 | 10.2 | 2,650 | 8.5 | 1,520 |
| 21 | 21.9 | 50,680 | 16.9 | 27,080 | 10.9 | 7,590 | 9.6 | 4,830 | 10.0 | 2,650 | 8.6 | 1,470 |
| 22 | 20.9 | 45,500 | 18.3 | 33,150 | 11.2 | 8,310 | 9.7 | 5,030 | 9.8 | 2,660 | 8.6 | 1,450 |
| 23 | 19.7 | 39,560 | 17.3 | 28,760 | 10.9 | 7,590 | 9.6 | 4,830 | 9.6 | 2,590 | 8.7 | 1,430 |
| 24 | 19.5 | 38,600 | 16.8 | 26,670 | 10.9 | 7,590 | 9.7 | 5,030 | 9.5 | 2,470 | 8.6 | 1,420 |
| 25 | 18.9 | 35,850 | 16.2 | 24,260 | 10.7 | 7,130 | 9.6 | 4,830 | 9.2 | 2,380 | 8.6 | 1,360 |
| 26 | 18.4 | 33,600 | 15.9 | 23,090 | 10.8 | 7,350 | 9.6 | 4,830 | 9.1 | 2,320 | 8.8 | 1,380 |
| 27 | 17.6 | 30,040 | 15.7 | 22,310 | 10.8 | 7,350 | 9.4 | 4,450 | 8.8 | 2,290 | 8.9 | 1,390 |
| 28 | 17.2 | 28,340 | 15.4 | 21,160 | 10.6 | 6,910 | 9.4 | 4,450 | 9.1 | 2,270 | 8.9 | 1,340 |
| 29 | 16.8 | 26,670 | 15.0 | 19,680 | 10.6 | 6,910 | 9.4 | 4,450 | 8.9 | 2,230 | 9.0 | 1,340 |
| 30 | 16.8 | 26,670 | 14.6 | 18,260 | 10.5 | 6,690 | 9.6 | 4,830 | 8.7 | 2,230 | 9.1 | 1,330 |
| 31 | 16.9 | 27,080 | 14.7 | 18,600 | ..... | ..... | 9.4 | 4,450 | ..... | ..... | 9.0 | 1,320*e* |

*c* Open water April 9 to Nov. 9.
Curve No. 1 April 9 to June 28; curve No. 2 June 29 to Nov. 9.
*d* River freezing Nov. 10 to 12; discharge interpolated.
*e* Ice conditions Nov. 13 to Dec. 31.

MONTHLY DISCHARGE of North Saskatchewan River at Edmonton, for 1915.

(Drainage area 10,620 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 1,350 | 1,010 | 1,223 | 0.115 | 0.13 | 75,196 |
| February | 1,120 | 1,040 | 1,079 | 0.102 | 0.11 | 59,924 |
| March | 2,420 | 1,115 | 1,677 | 0.158 | 0.18 | 103,114 |
| April | 4,700 | 2,220 | 3,323 | 0.313 | 0.35 | 197,730 |
| May | 14,780 | 3,280 | 8,373 | 0.788 | 0.91 | 514,836 |
| June | 185,560 | 17,420 | 39,272 | 3.700 | 4.13 | 2,336,848 |
| July | 90,200 | 26,670 | 42,661 | 4.020 | 4.64 | 2,623,121 |
| August | 33,150 | 18,260 | 23,554 | 2.220 | 2.56 | 1,448,294 |
| September | 18,600 | 6,690 | 10,294 | 0.969 | 1.08 | 612,540 |
| October | 8,070 | 4,450 | 5,673 | 0.534 | 0.62 | 348,816 |
| November | 4,450 | 2,230 | 3,013 | 0.284 | 0.32 | 179,287 |
| December | 2,280 | 1,320 | 1,716 | 0.162 | 0.19 | 105,512 |
| The year | ..... | ..... | ..... | ..... | 15.22 | 8,605,218 |

## Monthly Discharge of North Saskatchewan River at Edmonton, for 1914.

(Drainage area 10,620 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 1,450 | 968 | 1,213 | 0.114 | 0.13 | 74,583 |
| February | 1,100 | 800 | 952 | 0.090 | 0.09 | 52,871 |
| March | 1,300 | 975 | 1,134 | 0.107 | 0.12 | 69,728 |
| April | 6,570 | 1,075 | 2,983 | 0.281 | 0.31 | 177,501 |
| May | 15,000 | 3,950 | 9,064 | 0.854 | 0.98 | 557,324 |
| June | 61,740 | 5,440 | 24,618 | 2.320 | 2.59 | 1,464,880 |
| July | 25,620 | 11,130 | 18,889 | 1.780 | 2.05 | 1,161,429 |
| August | 14,400 | 9,110 | 11,099 | 1.040 | 1.20 | 682,439 |
| September | 9,370 | 4,240 | 6,492 | 0.611 | 0.68 | 386,300 |
| October | 5,840 | 3,130 | 4,558 | 0.429 | 0.49 | 280,258 |
| November | 2,970 | 2,050 | 2,473 | 0.233 | 0.26 | 147,157 |
| December | 2,350 | 700 | 1,102 | 0.104 | 0.12 | 67,762 |
| The year | ..... | ..... | ..... | ..... | 9.02 | 5,122,232 |

Note.—This table is inserted in this report to correct a table which was published on page 76 of the report for 1914. The records for the month of April and the totals were incorrect as then published.

STURGEON RIVER NEAR MCDONALD'S RANCH.

*Location.*—On the NW. ¼ Sec. 13, Tp. 54, Rge. 5, W. 5th Mer., at traffic bridge near McDonald's ranch and 100 feet below Canadian Northern Railway trestle over Sturgeon River.

*Records available.*—April 21, 1914, to November 1, 1914, and March 4, 1915, to October 31, 1915.

*Gauge.*—Vertical staff on right bank of river, spiked to pile on upstream side of bridge. Datum maintained at 90.32 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark on left bank of stream 50 feet upstream from gauge. Assumed elevation, 100.00 feet.

*Channel.*—One channel at all stages, shifting.

*Discharge measurements.*—Made from a bridge.

*Winter flow.*—Gauge height observations discontinued on November 1. One discharge measurement made under winter conditions.

*Observer.*—H. H. Jones.

*Remarks.*—Relation between gauge height and discharge changed during summer because of a growth of weeds in the river.

DISCHARGE MEASUREMENTS of Sturgeon River near McDonald's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 4 | R. J. McGuinness | 27 | 9.05 | 0.04 | 3.01 | 0.37 |
| April 1 | J. M. Paul | 30 | 36.50 | 0.80 | 2.91 | 29.00 |
| April 19 | do | 27 | 34.90 | 0.82 | 2.78 | 28.00 |
| May 10 | do | 25 | 32.80 | 0.60 | 2.68 | 19.70 |
| May 29 | do | 26 | 32.40 | 0.81 | 2.64 | 26.00 |
| June 15 | do | 53 | 136.20 | 1.46 | 4.63 | 199.00 |
| July 7 | do | 53 | 113.60 | 0.75 | 4.13 | 85.00 |
| July 26 | do | 53 | 148.70 | 0.56 | 4.71 | 83.00 |
| Aug. 11 | P. M. Sauder and J. M. Paul | 53 | 131.20 | 0.37 | 4.53 | 49.00 |
| Aug. 30 | J. M. Paul | 53 | 122.00 | 0.30 | 4.33 | 36.00 |
| Sept. 15 | T. H. Burt | 53 | 110.00 | 0.42 | 3.96 | 46.00 |
| Oct. 1 | J. M. Paul | 53 | 91.00 | 0.39 | 3.66 | 35.00 |
| Oct. 20 | do | 53 | 72.60 | 0.56 | 3.33 | 41.00 |

DAILY GAUGE HEIGHT AND DISCHARGE of Sturgeon River near McDonald's Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.85 | 28 | 2.75 | 26 | 2.85 | 28 |
| 2 | ..... | ..... | 2.85 | 28 | 2.73 | 25 | 2.98 | 31 |
| 3 | ..... | ..... | 2.89 | 29 | 2.71 | 25 | 3.40 | 43 |
| 4 | ..... | ..... | 2.89 | 29 | 2.70 | 24 | 4.00 | 74 |
| 5 | ..... | ..... | 2.89 | 29 | 2.69 | 24 | 4.02 | 76 |
| 6 | ..... | ..... | 2.89 | 29 | 2.68 | 24 | 3.85 | 64 |
| 7 | ..... | ..... | 2.89 | 29 | 2.68 | 24 | 4.20 | 92 |
| 8 | ..... | ..... | 2.89 | 29 | 2.68 | 24 | 4.65 | 205 |
| 9 | ..... | ..... | 2.87 | 28 | 2.67 | 24 | 4.75 | 241 |
| 10 | ..... | ..... | 2.87 | 28 | 2.66 | 24 | 4.80 | 259 |
| 11 | ..... | ..... | 2.85 | 28 | 2.65 | 23 | 4.85 | 277 |
| 12 | ..... | ..... | 2.85 | 28 | 2.64 | 23 | 4.82 | 266 |
| 13 | ..... | ..... | 2.84 | 27 | 2.60 | 22 | 4.75 | 241 |
| 14 | ..... | ..... | 2.84 | 27 | 2.57 | 22 | 4.70 | 223 |
| 15 | ..... | ..... | 2.83 | 27 | 2.55 | 21 | 4.70 | 223 |
| 16 | ..... | ..... | 2.83 | 27 | 2.54 | 21 | 4.68 | 216 |
| 17 | ..... | ..... | 2.83 | 27 | 2.54 | 21 | 4.68 | 216 |
| 18 | 3.41 | 44 | 2.83 | 27 | 2.53 | 21 | 4.67 | 212 |
| 19 | 3.42 | 44 | 2.79 | 26 | 2.52 | 21 | 4.62 | 194 |
| 20 | 3.43 | 44 | 2.78 | 26 | 2.50 | 20 | 4.56 | 173 |
| 21 | 3.44 | 45 | 2.79 | 26 | 2.50 | 20 | 4.50 | 151 |
| 22 | 3.50 | 47 | 2.78 | 26 | 2.50 | 20 | 4.49 | 148 |
| 23 | 3.51 | 48 | 2.78 | 26 | 2.49 | 20 | 4.47 | 143 |
| 24 | 3.37 | 42 | 2.78 | 26 | 2.48 | 20 | 4.45 | 138 |
| 25 | 3.38 | 43 | 2.77 | 26 | 2.49 | 20 | 4.40 | 124 |
| 26 | 3.29 | 40 | 2.77 | 26 | 2.50 | 20 | 4.40 | 124 |
| 27 | 3.30 | 40 | 2.77 | 26 | 2.50 | 20 | 4.38 | 120 |
| 28 | 3.31 | 40 | 2.76 | 26 | 2.55 | 21 | 4.37 | 119 |
| 29 | 3.33 | 41 | 2.76 | 26 | 2.55 | 21 | 4.35 | 115 |
| 30 | 3.25 | 38 | 2.75 | 26 | 2.58 | 22 | 4.35 | 115 |
| 31 | 3.26 | 38 | ..... | ..... | 2.80 | 27 | ..... | ..... |

PLATE 10

North Saskatchewan River in flood at Edmonton, on June 28, 1915. General view looking west from road to low level traffic bridge. Note the same building (grist mill) as in the full-page view. Water was about three feet below maximum when this photograph was taken. Taken by I. R. Strome.

PLATE 11

North Saskatchewan River in flood at Edmonton, on June 28, 1915. Note the loaded cars on the bridge to weigh it down. Water was about one foot below maximum when this photograph was taken. Taken by I. R. Strome.

DAILY GAUGE HEIGHT AND DISCHARGE of Sturgeon River near McDonald's Ranch, for 1915. —*Concluded.*

| DAY. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 4.30 | 106 | 4.63 | 70 | 4.35 | 40 | 3.70 | 36 |
| 2 | 4.25 | 99 | 4.63 | 68 | 4.30 | 39 | 3.70 | 37 |
| 3 | 4.20 | 92 | 4.62 | 66 | 4.24 | 39 | 3.70 | 38 |
| 4 | 4.15 | 87 | 4.62 | 65 | 4.20 | 39 | 3.68 | 38 |
| 5 | 4.10 | 82 | 4.61 | 63 | 4.20 | 40 | 3.65 | 38 |
| 6 | 4.10 | 82 | 4.61 | 61 | 4.20 | 42 | 3.65 | 39 |
| 7 | 4.10 | 82 | 4.60 | 59 | 4.18 | 43 | 3.63 | 39 |
| 8 | 4.10 | 79 | 4.60 | 58 | 4.16 | 44 | 3.60 | 39 |
| 9 | 4.10 | 76 | 4.60 | 56 | 4.15 | 45 | 3.57 | 39 |
| 10 | 4.10 | 74 | 4.59 | 56 | 4.12 | 45 | 3.55 | 40 |
| 11 | 4.15 | 76 | 4.59 | 52 | 4.10 | 46 | 3.55 | 40 |
| 12 | 4.15 | 73 | 4.58 | 51 | 4.05 | 46 | 3.48 | 39 |
| 13 | 4.20 | 75 | 4.57 | 50 | 4.02 | 46 | 3.45 | 39 |
| 14 | 4.42 | 92 | 4.55 | 49 | 4.00 | 46 | 3.40 | 38 |
| 15 | 4.55 | 106 | 4.55 | 49 | 4.00 | 48 | 3.38 | 38 |
| 16 | 4.56 | 102 | 4.55 | 48 | 4.00 | 48 | 3.35 | 38 |
| 17 | 4.57 | 99 | 4.55 | 48 | 4.00 | 48 | 3.35 | 39 |
| 18 | 4.57 | 95 | 4.53 | 47 | 4.00 | 48 | 3.35 | 40 |
| 19 | 4.59 | 94 | 4.50 | 46 | 4.00 | 48 | 3.35 | 40 |
| 20 | 4.60 | 92 | 4.48 | 44 | 4.00 | 48 | 3.33 | 41 |
| 21 | 4.65 | 94 | 4.47 | 44 | 4.00 | 48 | 3.30 | 40 |
| 22 | 4.68 | 94 | 4.45 | 43 | 4.00 | 48 | 3.29 | 40 |
| 23 | 4.70 | 92 | 4.45 | 42 | 4.00 | 48 | 3.28 | 39 |
| 24 | 4.70 | 88 | 4.45 | 42 | 4.00 | 47 | 3.25 | 38 |
| 25 | 4.70 | 86 | 4.45 | 42 | 3.95 | 45 | 3.24 | 38 |
| 26 | 4.70 | 82 | 4.45 | 41 | 3.95 | 45 | 3.20 | 37 |
| 27 | 4.70 | 81 | 4.45 | 41 | 3.90 | 43 | 3.20 | 37 |
| 28 | 4.69 | 80 | 4.44 | 40 | 3.89 | 43 | 3.20 | 37 |
| 29 | 4.65 | 75 | 4.44 | 40 | 3.86 | 42 | 3.20 | 37 |
| 30 | 4.65 | 74 | 4.42 | 39 | 3.80 | 40 | 3.20 | 37 |
| 31 | 4.63 | 71 | 4.40 | 40 | ..... | ..... | 3.20 | 37 |

Shifting conditions July 8 to Oct. 19.

MONTHLY DISCHARGE of Sturgeon River near McDonald's Ranch, for 1915.

(Drainage area 100 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (18-31) | 48 | 38 | 42 | 0.42 | 0.22 | 1,166 |
| April | 29 | 26 | 27 | 0.27 | 0.30 | 1,607 |
| May | 27 | 20 | 22 | 0.22 | 0.25 | 1,353 |
| June | 277 | 28 | 155 | 1.55 | 1.73 | 9,223 |
| July | 106 | 71 | 86 | 0.86 | 0.99 | 5,288 |
| August | 70 | 39 | 50 | 0.50 | 0.58 | 3,074 |
| September | 48 | 39 | 44 | 0.44 | 0.49 | 2,618 |
| October | 41 | 36 | 38 | 0.38 | 0.44 | 2,337 |
| The period | | | | | 5.00 | 26,666 |

STURGEON RIVER NEAR ONOWAY.

*Location.*—On the SE. ¼ of Sec. 7, Tp. 55, Rge. 2, W. 5th Mer., at a highway bridge about 3 miles northwest of Onoway near Trek's ranch.

*Records available.*—April 23, 1914, to November 1, 1914, and March 3, 1915, to October 31, 1915.

*Gauge.*—Vertical staff, spiked to pile near centre of downstream side of bridge. Datum maintained at 95.16 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark on downstream side of east abutment. Assumed elevation, 100.00 feet.

*Channel.*—One channel at all stages, permanent.

*Discharge measurements.*—Made from a bridge.

*Winter flow.*—Gauge height observations discontinued on November 1. Stream affected by ice from November to April.

*Observer.*—J. Calnan.

*Remarks.*—Relation of gauge height to discharge changed during summer because of a growth of weeds in the river.

DISCHARGE MEASUREMENTS of Sturgeon River near Onoway, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 3 | R. J. McGuinness | 38 | 59 | 0.76 | 3.35 | 45 |
| Mar. 31 | J. M. Paul | 38 | 71 | 1.05 | 1.96 | 74 |
| April 17 | do | 36 | 73 | 1.33 | 2.27 | 97 |
| May 13 | do | 35 | 62 | 0.98 | 2.09 | 61 |
| June 1 | do | 35 | 64 | 1.01 | 2.13 | 65 |
| June 17 | do | 37 | 93 | 1.20 | 2.86 | 113 |
| July 9 | do | 37 | 95 | 0.59 | 2.83 | 56 |
| July 28 | do | 37 | 98 | 0.60 | 3.04 | 59 |
| Aug. 13 | do | 37 | 112 | 0.47 | 3.20 | 52 |
| Aug. 27 | do | 37 | 117 | 0.51 | 3.44 | 60 |
| Sept. 16 | T. H. Burt | 35 | 111 | 0.70 | 3.30 | 77 |
| Oct. 2 | J. M. Paul | 37 | 104 | 0.89 | 3.14 | 92 |
| Oct. 21 | do | 34 | 97 | 1.10 | 3.02 | 107 |

DAILY GAUGE HEIGHT AND DISCHARGE of Sturgeon River near Onoway, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.02 | 78 | 2.30 | 86 | 2.10 | 63 |
| 2 | ..... | ..... | 2.04 | 80 | 2.30 | 85 | 2.10 | 63 |
| 3 | ..... | ..... | 2.06 | 81 | 2.30 | 84 | 2.50 | 87 |
| 4 | ..... | ..... | 2.18 | 90 | 2.30 | 83 | 3.00 | 124 |
| 5 | ..... | ..... | 2.20 | 91 | 2.30 | 81 | 2.70 | 101 |
| 6 | ..... | ..... | 2.21 | 92 | 2.30 | 80 | 2.60 | 94 |
| 7 | ..... | ..... | 2.22 | 93 | 2.30 | 79 | 2.50 | 87 |
| 8 | ..... | ..... | 2.23 | 94 | 2.30 | 78 | 2.40 | 80 |
| 9 | ..... | ..... | 2.24 | 95 | 2.30 | 76 | 4.00 | 204 |
| 10 | ..... | ..... | 2.25 | 96 | 2.30 | 75 | 4.40 | 236 |
| 11 | 3.00 | 163 | 2.26 | 96 | 2.30 | 74 | 3.50 | 164 |
| 12 | 3.00 | 163 | 2.27 | 97 | 2.30 | 74*a* | 3.20 | 140 |
| 13 | 3.00 | 163 | 2.28 | 98 | 2.20 | 68 | 3.10 | 132 |
| 14 | 3.00 | 163 | 2.30 | 100 | 2.20 | 68 | 3.00 | 124 |
| 15 | 3.00 | 163 | 2.32 | 102 | 2.20 | 68 | 2.80 | 108 |
| 16 | 3.00 | 163 | 2.34 | 104 | 2.20 | 68 | 2.80 | 108 |
| 17 | 3.00 | 163 | 2.30 | 100 | 2.10 | 63 | 2.80 | 108 |
| 18 | 3.00 | 163 | 2.30 | 99*a* | 2.10 | 63 | 2.80 | 106*b* |
| 19 | 3.00 | 163 | 2.30 | 98 | 2.10 | 63 | 2.80 | 104 |
| 20 | 2.70 | 136 | 2.30 | 98 | 2.10 | 63 | 2.80 | 102 |
| 21 | 2.20 | 91 | 2.30 | 96 | 2.10 | 63 | 2.80 | 99 |
| 22 | 2.10 | 84 | 2.30 | 96 | 2.10 | 63 | 2.80 | 97 |
| 23 | 2.10 | 84 | 2.30 | 95 | 2.10 | 63 | 2.80 | 94 |
| 24 | 2.10 | 84 | 2.30 | 94 | 2.10 | 63 | 2.80 | 92 |
| 25 | 2.10 | 84 | 2.30 | 93 | 2.10 | 63 | 2.80 | 89 |
| 26 | 2.10 | 84 | 2.30 | 92 | 2.10 | 63 | 2.80 | 87 |
| 27 | 2.10 | 84 | 2.00 | 70 | 2.10 | 63 | 3.00 | 98 |
| 28 | 2.10 | 84 | 2.30 | 90 | 2.10 | 63 | 2.80 | 82 |
| 29 | 2.10 | 84 | 2.30 | 88 | 2.10 | 63 | 2.80 | 79 |
| 30 | 2.10 | 84 | 2.30 | 87 | 2.10 | 63 | 3.10 | 98 |
| 31 | 2.00 | 77 | ..... | ..... | 2.10 | 63 | ..... | ..... |

*a* Shifting conditions April 18 to May 12.
*b* Shifting conditions June 18 to Oct. 31.

DAILY GAUGE HEIGHT AND DISCHARGE of Sturgeon River near Onoway, for 1915—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.00 | 88 | 3.00 | 54 | 3.40 | 63 | 3.10 | 88 |
| 2 | 3.00 | 85 | 3.00 | 53 | 3.40 | 64 | 3.10 | 89 |
| 3 | 3.00 | 82 | 3.10 | 56 | 3.40 | 66 | 3.10 | 90 |
| 4 | 3.00 | 80 | 3.10 | 56 | 3.40 | 67 | 3.10 | 92 |
| 5 | 2.80 | 65 | 3.10 | 55 | 3.30 | 63 | 3.10 | 93 |
| 6 | 2.80 | 62 | 3.10 | 54 | 3.30 | 64 | 3.10 | 94 |
| 7 | 2.80 | 60 | 3.10 | 53 | 3.30 | 66 | 3.10 | 95 |
| 8 | 2.80 | 57 | 3.10 | 52 | 3.40 | 73 | 3.20 | 104 |
| 9 | 2.80 | 55 | 3.10 | 51 | 3.30 | 69 | 3.20 | 105 |
| 10 | 2.80 | 54 | 3.10 | 50 | 3.30 | 70 | 3.20 | 106 |
| 11 | 3.00 | 63 | 3.10 | 50 | 3.30 | 72 | 3.20 | 108 |
| 12 | 3.10 | 69 | 3.20 | 52 | 3.30 | 73 | 3.10 | 102 |
| 13 | 3.00 | 62 | 3.20 | 52 | 3.30 | 74 | 3.10 | 103 |
| 14 | 3.10 | 68 | 3.20 | 52 | 3.20 | 69 | 3.10 | 104 |
| 15 | 3.10 | 68 | 3.20 | 52 | 3.20 | 70 | 3.10 | 105 |
| 16 | 3.10 | 67 | 3.20 | 52 | 3.20 | 71 | 3.10 | 106 |
| 17 | 3.10 | 67 | 3.20 | 51 | 3.30 | 78 | 3.10 | 108 |
| 18 | 3.00 | 61 | 3.20 | 51 | 3.30 | 80 | 3.10 | 109 |
| 19 | 3.00 | 60 | 3.40 | 60 | 3.30 | 82 | 3.10 | 110 |
| 20 | 3.10 | 65 | 3.40 | 60 | 3.30 | 84 | 3.10 | 112 |
| 21 | 3.10 | 65 | 3.40 | 60 | 3.30 | 85 | 3.00 | 106 |
| 22 | 3.10 | 64 | 3.40 | 60 | 3.30 | 87 | 3.00 | 106 |
| 23 | 3.10 | 64 | 3.40 | 59 | 3.20 | 82 | 3.00 | 106 |
| 24 | 3.10 | 64 | 3.40 | 59 | 3.20 | 83 | 3.00 | 106 |
| 25 | 3.10 | 64 | 3.40 | 59 | 3.20 | 85 | 3.00 | 106 |
| 26 | 3.10 | 63 | 3.40 | 58 | 3.20 | 86 | 3.00 | 106 |
| 27 | 3.10 | 63 | 3.40 | 58 | 3.20 | 88 | 3.00 | 106 |
| 28 | 3.00 | 57 | 3.30 | 54 | 3.10 | 83 | 3.00 | 106 |
| 29 | 3.00 | 56 | 3.40 | 60 | 3.10 | 84 | 3.00 | 106 |
| 30 | 3.00 | 56 | 3.40 | 61 | 3.10 | 86 | 3.10 | 110 |
| 31 | 3.00 | 55 | 3.40 | 62 | ..... | ..... | 3.00 | 106*b* |

*b* Shifting conditions June 18 to Oct. 31.

MONTHLY DISCHARGE of Sturgeon River near Onoway, for 1915.

(Drainage area 241 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (11-31) | 163 | 77 | 120 | 0.498 | 0.39 | 4,998 |
| April | 104 | 70 | 93 | 0.386 | 0.43 | 5,534 |
| May | 86 | 63 | 70 | 0.290 | 0.33 | 4,304 |
| June | 236 | 63 | 108 | 0.448 | 0.50 | 6,426 |
| July | 88 | 54 | 65 | 0.270 | 0.31 | 3,997 |
| August | 62 | 50 | 55 | 0.228 | 0.26 | 3,382 |
| September | 88 | 63 | 76 | 0.315 | 0.35 | 4,522 |
| October | 112 | 88 | 103 | 0.427 | 0.49 | 6,333 |
| The period | | | | | 3.06 | 39,496 |

STURGEON RIVER NEAR VILLENEUVE.

*Location.*—On the NW. ¼ Sec. 31, Tp. 54, Rge. 26, W. 4th Mer., at the highway bridge near Mageau's ranch, and about two and one-half miles north of Villeneuve and about three miles west of Ray.

*Records available.*—April 22, 1914, to October 31, 1914, and March 2, 1915, to October 30, 1915.

*Gauge.*—Vertical staff, spiked to upstream end of the pier near the right bank. Elevation of zero of gauge 88.97 feet.

*Bench-mark.*—Permanent iron bench-mark on left bank of river and 30 feet upstream from bridge. Assumed elevation, 100.00 feet.

*Channels.*—Straight for about 25 feet on either side of section. Gravel bed covered with clay and sand, fairly permanent. Two channels at high stages, one channel at low stages.

*Discharge measurements.*—Made from a bridge.

*Winter flow.*—Gauge height observations discontinued on November 1. Stream affected by ice from November to April.

*Observer.*—V. Mageau.

DISCHARGE MEASUREMENTS of Sturgeon River near Villeneuve, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 2 | R. J. McGuinness | 50.0 | 135.5 | 0.53 | 4.62 | 72 |
| Mar. 30 | J. M. Paul | 54.0 | 263.0 | 1.01 | 5.78 | 266 |
| April 16 | do | 46.5 | 230.0 | 0.81 | 4.03 | 187 |
| May 12 | do | 44.5 | 182.5 | 0.35 | 3.16 | 64 |
| May 31 | do | 44.5 | 176.2 | 0.51 | 2.94 | 90 |
| June 12 | do | 70.5 | 668.0 | 2.76 | 11.05 | 1,839 |
| June 16 | do | 73.0 | 573.7 | 1.87 | 9.35 | 1,072 |
| July 8 | do | 54.0 | 241.4 | 0.92 | 4.31 | 223 |
| July 27 | do | 53.5 | 221.8 | 0.87 | 4.11 | 194 |
| Aug. 12 | do | 47.5 | 167.8 | 0.58 | 3.24 | 97 |
| Aug. 28 | do | 47.5 | 160.4 | 0.50 | 3.12 | 80 |
| Sept. 17 | T. H. Burt | 47.5 | 174.0 | 0.58 | 3.31 | 100 |
| Oct. 3 | J. M. Paul | 48.5 | 175.6 | 0.62 | 3.42 | 109 |
| Oct. 22 | do | 49.5 | 183.9 | 0.68 | 3.55 | 126 |

DAILY GAUGE HEIGHT AND DISCHARGE of Sturgeon River near Villeneuve, for 1915.

| Day. | April. | | May. | | June. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 3.50 | 128 | 3.00 | 82 |
| 2 | ..... | ..... | 3.45 | 123 | 3.20 | 99 |
| 3 | ..... | ..... | 3.45 | 123 | 5.20 | 337 |
| 4 | ..... | ..... | 3.45 | 123 | 6.30 | 491 |
| 5 | ..... | ..... | 3.45 | 123 | 7.00 | 598 |
| 6 | ..... | ..... | 3.40 | 118 | 7.25 | 638 |
| 7 | ..... | ..... | 3.35 | 113 | 7.30 | 646 |
| 8 | 5.90 | 432 | 3.32 | 110 | 7.10 | 614 |
| 9 | 5.70 | 404 | 3.30 | 108 | 7.62 | 702 |
| 10 | 5.10 | 324 | 3.25 | 104 | 8.80 | 937 |
| 11 | 4.70 | 272 | 3.20 | 99 | 10.76 | 1,661 |
| 12 | 4.50 | 246 | 3.20 | 99 | 10.92 | 1,756 |
| 13 | 4.30 | 220 | 3.15 | 99 | 10.97 | 1,787 |
| 14 | 4.20 | 207 | 3.10 | 90 | 10.72 | 1,638 |
| 15 | 4.10 | 194 | 3.00 | 82 | 10.22 | 1,378 |
| 16 | 4.05 | 188 | 2.95 | 78 | 9.60 | 1,145 |
| 17 | 4.00 | 182 | 2.95 | 78 | 8.95 | 972 |
| 18 | 3.85 | 164 | 2.90 | 74 | 8.35 | 838 |
| 19 | 3.75 | 154 | 2.85 | 70 | 7.70 | 716 |
| 20 | 3.65 | 143 | 2.80 | 67 | 7.00 | 598 |
| 21 | 3.60 | 138 | 2.75 | 64 | 6.45 | 514 |
| 22 | 3.65 | 143 | 2.70 | 60 | 6.05 | 453 |
| 23 | 3.75 | 154 | 2.70 | 60 | 5.75 | 411 |
| 24 | 3.78 | 157 | 2.70 | 60 | 5.50 | 376 |
| 25 | 3.73 | 151 | 2.75 | 64 | 5.25 | 344 |
| 26 | 3.70 | 148 | 2.80 | 67 | 5.10 | 324 |
| 27 | 3.60 | 138 | 2.85 | 70 | 6.70 | 551 |
| 28 | 3.60 | 138 | 2.85 | 70 | 7.00 | 598 |
| 29 | 3.55 | 133 | 2.85 | 70 | 6.70 | 551 |
| 30 | 3.50 | 128 | 2.90 | 74 | 6.50 | 521 |
| 31 | ..... | ..... | 2.90 | 74 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Sturgeon River near Villeneuve, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 6.35 | 498 | 3.65 | 143 | 3.12 | 92 | 3.32 | 110 |
| 2 | 6.10 | 461 | 3.60 | 138 | 3.10 | 90 | 3.32 | 110 |
| 3 | 5.70 | 404 | 3.55 | 133 | 3.10 | 90 | 3.40 | 118 |
| 4 | 5.05 | 318 | 3.50 | 128 | 3.10 | 90 | 3.42 | 120 |
| 5 | 5.00 | 311 | 3.45 | 123 | 3.10 | 90 | 3.45 | 123 |
| 6 | 4.70 | 272 | 3.40 | 118 | 3.11 | 91 | 3.48 | 126 |
| 7 | 4.45 | 240 | 3.40 | 118 | 3.15 | 94 | 3.48 | 126 |
| 8 | 4.35 | 226 | 3.35 | 113 | 3.15 | 94 | 3.48 | 126 |
| 9 | 4.25 | 214 | 3.30 | 108 | 3.15 | 94 | 3.48 | 126 |
| 10 | 4.25 | 214 | 3.30 | 108 | 3.17 | 96 | 3.48 | 126 |
| 11 | 4.40 | 233 | 3.25 | 104 | 3.15 | 94 | 3.50 | 128 |
| 12 | 4.35 | 226 | 3.25 | 104 | 3.15 | 94 | 3.50 | 128 |
| 13 | 4.40 | 233 | 3.20 | 99 | 3.17 | 96 | 3.50 | 128 |
| 14 | 4.55 | 252 | 3.15 | 94 | 3.18 | 97 | 3.49 | 127 |
| 15 | 4.60 | 259 | 3.10 | 90 | 3.20 | 99 | 3.51 | 129 |
| 16 | 4.80 | 285 | 3.10 | 90 | 3.28 | 106 | 3.51 | 129 |
| 17 | 4.90 | 298 | 3.05 | 86 | 3.30 | 108 | 3.51 | 129 |
| 18 | 5.00 | 311 | 3.05 | 86 | 3.31 | 109 | 3.52 | 130 |
| 19 | 5.00 | 311 | 3.10 | 90 | 3.31 | 109 | 3.53 | 131 |
| 20 | 4.90 | 298 | 3.10 | 90 | 3.31 | 109 | 3.54 | 132 |
| 21 | 4.80 | 285 | 3.08 | 88 | 3.32 | 110 | 3.54 | 132 |
| 22 | 4.65 | 266 | 3.06 | 87 | 3.32 | 110 | 3.54 | 132 |
| 23 | 4.50 | 246 | 3.05 | 86 | 3.32 | 110 | 3.54 | 132 |
| 24 | 4.35 | 226 | 3.03 | 84 | 3.32 | 110 | 3.50 | 128 |
| 25 | 4.25 | 214 | 3.02 | 84 | 3.32 | 110 | 3.50 | 128 |
| 26 | 4.20 | 207 | 3.02 | 84 | 3.32 | 110 | 3.40 | 118 |
| 27 | 4.15 | 200 | 3.08 | 88 | 3.31 | 109 | 3.40 | 118 |
| 28 | 4.03*a* | 186 | 3.09 | 89 | 3.31 | 109 | 3.40 | 118 |
| 29 | 3.90 | 170 | 3.12 | 92 | 3.31 | 109 | 3.40 | 118 |
| 30 | 3.85 | 164 | 3.12 | 92 | 3.32*a* | 110 | 3.40*a* | 118 |
| 31 | 3.70 | 148 | 3.12 | 92 | ..... | ..... | 3.40 | 118 |

*a* Gauge heights interpolated.

MONTHLY DISCHARGE of Sturgeon River near Villeneuve, for 1915.

(Drainage area 506 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| April (8 to 30) | 432 | 128 | 198 | 0.391 | 0.33 | 9,031 |
| May | 128 | 60 | 88 | 0.174 | 0.20 | 5,411 |
| June | 1,787 | 82 | 743 | 1.468 | 1.64 | 44,212 |
| July | 498 | 148 | 264 | 0.522 | 0.60 | 16,233 |
| August | 143 | 84 | 101 | 0.200 | 0.23 | 6,210 |
| September | 110 | 90 | 101 | 0.200 | 0.22 | 6,010 |
| October | 132 | 110 | 125 | 0.247 | 0.28 | 7,686 |
| The period | | | | | 3.50 | 94,793 |

STURGEON RIVER AT ST. ALBERT.

*Location.*—Between river lots 27 and 52 in St. Albert settlement, Alberta, at the highway bridge crossing the Sturgeon river in the village of St. Albert.

*Records available.*—April 23, 1913, to October 31, 1915.

*Gauge.*—Vertical staff fastened to sheet piling on the left bank of the river near the upstream face of the left abutment. Zero elevation maintained at 90.23 feet since establishment.

*Bench-mark.*—On the cement sill of the east basement window of the St. Albert hotel and marked "B.M., D. 1" and "broad arrow," in white paint. Assumed elevation, 100.00 feet.

*Channel.*—One channel at all stages, fairly permanent.
*Control.*—Vegetation in bed of stream causes a change of control during the summer.
*Discharge measurements.*—Made from a bridge.
*Winter flow.*—Stream affected by ice from November to April. Previously winter measurements have been taken but were discontinued during winter.
*Observer.*—Lawrence Farrel.

DISCHARGE MEASUREMENTS of Sturgeon River at St. Albert, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 8 | P. H. Daniells | 90 | 74 | 0.83 | 2.16 | 62 |
| Jan. 29 | R. J. McGuinness | 90 | 77 | 0.80 | 2.47 | 62 |
| Feb. 22 | do | 90 | 60 | 0.92 | 2.82 | 55 |
| Mar. 25 | J. M. Paul | 85 | 374 | 0.82 | 4.28 | 308 |
| April 8 | I. R. Strome | 85 | 365 | 1.37 | 4.13 | 501 |
| April 13 | J. M. Paul | 85 | 366 | 1.25 | 3.66 | 458 |
| April 26 | I. R. Strome | 85 | 237 | 0.99 | 2.51 | 234 |
| May 14 | do | 75 | 155 | 0.68 | 1.71 | 106 |
| June 4 | do | 84 | 210 | 0.84 | 2.20 | 176 |
| June 21 | G. H. Whyte and I. R. Strome | 85 | 604 | 1.45 | 6.82 | 879 |
| July 26 | I. R. Strome | 82 | 337 | 1.32 | 3.66 | 438 |
| Aug. 19 | do | 82 | 178 | 0.82 | 1.85 | 146 |
| Sept. 10 | do | 75 | 156 | 0.65 | 1.53 | 101 |
| Sept. 29 | do | 79 | 162 | 0.71 | 1.66 | 116 |
| Oct. 18 | do | 82 | 170 | 0.75 | 1.78 | 128 |
| Nov. 4 | do | 82 | 174 | 0.74 | 1.83 | 132 |

DAILY GAUGE HEIGHT AND DISCHARGE of Sturgeon River at St. Albert, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.07 | 60*a* | 2.53 | 61 | 2.90 | 57 | 4.10 | 520 | 2.27 | 192 |
| 2 | 2.08 | 59 | 2.51 | 61 | 2.92 | 57 | 4.00 | 500 | 2.29 | 195 |
| 3 | 2.08 | 58 | 2.48 | 61 | 2.93 | 58 | 3.95 | 490 | 2.25 | 189 |
| 4 | 2.10 | 58 | 2.50 | 62 | 2.95 | 58 | 3.90 | 480 | 2.19 | 181 |
| 5 | 2.12 | 59 | 2.51 | 62 | 2.96 | 59 | 3.85 | 470 | 2.18 | 179 |
| 6 | 2.12 | 60 | 2.54 | 60 | 2.96 | 59 | 3.87 | 474 | 2.13 | 172 |
| 7 | 2.12 | 61 | 2.54 | 59 | 2.97 | 59 | 3.91 | 482 | 2.20 | 182 |
| 8 | 2.16 | 62 | 2.59 | 57 | 2.99 | 60 | 3.96 | 492 | 2.04 | 161 |
| 9 | 2.17 | 63 | 2.62 | 56 | 3.00 | 60 | 3.97 | 494 | 2.03 | 160 |
| 10 | 2.19 | 64 | 2.62 | 57 | 3.01 | 61 | 3.94 | 488 | 2.04 | 161 |
| 11 | 2.21 | 64 | 2.63 | 58 | 3.01 | 61 | 3.84 | 468 | 1.98 | 154 |
| 12 | 2.21 | 64 | 2.66 | 59 | 3.03 | 62 | 3.77 | 454 | 1.88 | 142 |
| 13 | 2.22 | 63 | 2.69 | 59 | 3.05 | 62 | 3.67 | 434 | 1.92 | 146 |
| 14 | 2.23 | 60 | 2.69 | 60 | 3.07 | 63 | 3.60 | 420 | 1.73 | 124 |
| 15 | 2.25 | 58 | 2.70 | 60 | 3.08 | 64 | 3.45 | 390 | 1.66 | 116 |
| 16 | 2.27 | 60 | 2.74 | 59 | 3.10 | 65 | 3.35 | 371 | 1.72 | 122 |
| 17 | 2.28 | 63 | 2.76 | 58 | 3.12 | 66 | 3.25 | 353 | 1.67 | 117 |
| 18 | 2.29 | 66 | 2.76 | 56 | 3.22 | 67 | 3.15 | 335 | 1.62 | 112 |
| 19 | 2.33 | 66 | 2.78 | 56 | 3.27 | 67 | 3.01 | 310 | 1.62 | 112 |
| 20 | 2.35 | 65 | 2.81 | 56 | 3.32 | 68 | 2.80 | 274 | 1.60 | 110 |
| 21 | 2.36 | 64 | 2.81 | 55 | 3.41 | 69 | 2.77 | 269 | 1.57 | 107 |
| 22 | 2.39 | 63 | 2.82 | 55 | 3.46 | 70*a* | 2.76 | 267 | 1.52 | 102 |
| 23 | 2.41 | 62 | 2.87 | 57 | 3.86 | 135*b* | 2.70 | 257 | 1.45 | 95 |
| 24 | 2.43 | 64 | 2.88 | 58 | 4.01 | 200 | 2.60 | 240 | 1.34 | 85 |
| 25 | 2.45 | 63 | 2.89 | 56 | 4.29 | 265 | 2.50 | 225 | 1.32 | 84 |
| 26 | 2.47 | 62 | 2.89 | 55 | 4.44 | 330 | 2.39 | 209 | 1.44 | 94 |
| 27 | 2.47 | 60 | 2.90 | 56 | 4.50 | 395 | 2.54 | 231 | 1.41 | 91 |
| 28 | 2.47 | 61 | 2.90 | 56 | 4.48 | 460 | 2.54 | 231 | 1.38 | 88 |
| 29 | 2.49 | 62 | ..... | ..... | 4.47 | 525*b* | 2.42 | 213 | 1.37 | 88 |
| 30 | 2.52 | 62 | ..... | ..... | 4.40 | 580 | 2.38 | 207 | 1.49 | 99 |
| 31 | 2.54 | 60 | ..... | ..... | 4.25 | 550 | ..... | ..... | 1.42 | 92 |

*a* to *a* Ice conditions.
*b* to *b* Ice breakup; discharge interpolated.
*c* Shifting conditions June 13 to July 10.

DAILY GAUGE HEIGHT AND DISCHARGE of Sturgeon River at St. Albert, for 1915.—*Concluded.*

| Day. | June. | | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.44 | 94 | 6.12 | 836 | 2.97 | 303 | 1.56 | 106 | 1.67 | 117 |
| 2 | 1.60 | 110 | 6.03 | 825 | 2.87 | 286 | 1.55 | 105 | 1.68 | 118 |
| 3 | 1.85 | 138 | 5.98 | 828 | 2.77 | 269 | 1.54 | 104 | 1.70 | 120 |
| 4 | 2.10 | 168 | 5.87 | 814 | 2.67 | 252 | 1.52 | 102 | 1.72 | 122 |
| 5 | 2.53 | 229 | 5.76 | 800 | 2.57 | 235 | 1.50 | 100 | 1.75 | 126 |
| 6 | 2.88 | 288 | 5.59 | 776 | 2.47 | 220 | 1.53 | 103 | 1.75 | 126 |
| 7 | 3.18 | 340 | 5.42 | 750 | 2.37 | 205 | 1.53 | 103 | 1.75 | 126 |
| 8 | 3.46 | 392 | 5.30 | 736 | 2.52 | 228 | 1.53 | 103 | 1.74 | 125 |
| 9 | 3.81 | 462 | 5.17 | 720 | 2.32 | 199 | 1.53 | 103 | 1.73 | 124 |
| 10 | 4.19 | 538 | 5.04 | 702*c* | 2.27 | 192 | 1.53 | 103 | 1.75 | 126 |
| 11 | 4.51 | 602 | 4.91 | 682 | 2.22 | 185 | 1.53 | 103 | 1.75 | 126 |
| 12 | 5.01 | 702 | 4.84 | 668 | 2.12 | 171 | 1.52 | 102 | 1.77 | 128 |
| 13 | 5.54 | 792*c* | 4.61 | 622 | 2.07 | 164 | 1.51 | 101 | 1.77 | 128 |
| 14 | 5.97 | 858 | 4.47 | 594 | 2.02 | 158 | 1.49 | 99 | 1.76 | 127 |
| 15 | 6.28 | 900 | 4.42 | 584 | 1.97 | 152 | 1.54 | 104 | 1.75 | 126 |
| 16 | 6.57 | 940 | 4.34 | 568 | 1.92 | 146 | 1.56 | 106 | 1.78 | 130 |
| 17 | 6.76 | 958 | 4.27 | 554 | 1.86 | 139 | 1.58 | 108 | 1.77 | 128 |
| 18 | 6.88 | 960 | 4.24 | 548 | 1.87 | 140 | 1.60 | 110 | 1.78 | 130 |
| 19 | 6.90 | 940 | 4.19 | 538 | 1.83 | 136 | 1.61 | 111 | 1.81 | 133 |
| 20 | 6.89 | 916 | 4.12 | 524 | 1.80 | 132 | 1.62 | 112 | 1.80 | 132 |
| 21 | 6.82 | 879 | 4.05 | 510 | 1.77 | 128 | 1.61 | 111 | 1.79 | 131 |
| 22 | 6.75 | 875 | 4.00 | 500 | 1.73 | 124 | 1.62 | 112 | 1.81 | 133 |
| 23 | 6.62 | 858 | 3.92 | 484 | 1.70 | 120 | 1.61 | 111 | 1.82 | 134 |
| 24 | 6.49 | 840 | 3.82 | 464 | 1.65 | 115 | 1.61 | 111 | 1.83 | 136 |
| 25 | 6.35 | 820 | 3.72 | 444 | 1.62 | 112 | 1.63 | 113 | 1.85 | 138 |
| 26 | 6.12 | 784 | 3.67 | 434 | 1.61 | 111 | 1.61 | 111 | 1.85 | 138 |
| 27 | 6.04 | 780 | 3.54 | 408 | 1.63 | 113 | 1.62 | 112 | 1.85 | 138 |
| 28 | 6.17 | 814 | 3.44 | 388 | 1.60 | 110 | 1.66 | 116 | 1.86 | 139 |
| 29 | 6.17 | 824 | 3.32 | 366 | 1.59 | 109 | 1.68 | 118 | 1.88 | 142 |
| 30 | 6.17 | 836 | 3.22 | 348 | 1.58 | 108 | 1.66 | 116 | 1.85 | 138 |
| 31 | ..... | ..... | 3.12 | 330 | 1.57 | 107 | ..... | ..... | 1.90 | 144 |

*c* Shifting conditions June 13 to July 10.

MONTHLY DISCHARGE of Sturgeon River at St. Albert, for 1915.

(Drainage area 1,010 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 66 | 58 | 62 | 0.061 | 0.07 | 3,812 |
| February | 62 | 55 | 58 | 0.057 | 0.06 | 3,221 |
| March | 580 | 57 | 155 | 0.153 | 0.18 | 9,531 |
| April | 520 | 207 | 368 | 0.364 | 0.41 | 21,898 |
| May | 195 | 84 | 131 | 0.130 | 0.15 | 8,055 |
| June | 960 | 94 | 655 | 0.648 | 0.72 | 38,975 |
| July | 836 | 330 | 592 | 0.586 | 0.68 | 36,401 |
| August | 303 | 107 | 167 | 0.165 | 0.19 | 10,268 |
| September | 118 | 99 | 107 | 0.106 | 0.12 | 6,367 |
| October | 144 | 117 | 130 | 0.129 | 0.15 | 7,993 |
| The period | | | | | 2.73 | 146,521 |

STURGEON RIVER NEAR FORT SASKATCHEWAN.

*Location.*—On the NW. ¼ Sec. 28, Tp. 55, Rge. 22, W. 4th Mer., at the steel traffic bridge about five miles north of Fort Saskatchewan and one and one-half miles from the mouth of the river.

*Records available.*—January 1, 1914, to December 31, 1915. Discharge measurements only in 1913.

*Gauge.*—Vertical staff fastened to a pile on the left bank of the river. Chain gauge installed on August 20, 1915, on the centre of the bridge downstream side. Zero elevation of both gauges maintained at 87.52 feet since establishment.

*Bench-marks.*—Marked with white paint on top of the downstream side of the left abutment. Assumed elevation, 100.00 feet. Auxiliary bench-mark on downstream side of left wing wall marked "B.M., D.1.," and "broad arrow," in white paint. Elevation, 96.00 feet; referred to assumed bench-mark.

*Channel.*—One permanent channel at all stages.

*Discharge measurements.*—Made from a bridge.

*Winter flow.*—Stream affected by ice from November to April.

*Observer.*—A. McDougall.

DISCHARGE MEASUREMENTS of Sturgeon River near Fort Saskatchewan, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 5 | P. H. Daniells | 49 | 85 | 0.68 | 3.60 | 57 |
| Jan. 26 | R. J. McGuinness | 45 | 83 | 0.67 | 3.76 | 56 |
| Feb. 23 | do | 45 | 72 | 0.76 | 4.17 | 55 |
| Mar. 27 | J. M. Paul | 79 | 50 | 1.08 | 4.42 | 54 |
| April 9 | I. R. Strome | 79 | 237 | 2.62 | 4.24 | 623 |
| April 27 | do | 69 | 173 | 1.69 | 3.52 | 294 |
| May 15 | do | 64 | 143 | 1.04 | 3.14 | 148 |
| June 5 | do | 66 | 158 | 1.23 | 3.30 | 195 |
| June 22 | G. H. Whyte and I. R. Strome | 78 | 321 | 3.16 | 5.20 | 1,015 |
| July 27 | I. R. Strome | 76 | 230 | 2.18 | 4.10 | 501 |
| Aug. 20 | do | 68 | 157 | 1.12 | 3.30 | 175 |
| Sept. 11 | do | 68 | 144 | 0.86 | 3.13 | 124 |
| Oct. 1 | do | 68 | 144 | 0.88 | 3.17 | 127 |
| Oct. 19 | do | 68 | 145 | 0.94 | 3.22 | 137 |
| Nov. 8 | J. M. Paul | 73 | 173 | 1.27 | 3.31 | 221 |
| Nov. 30 | do | 66 | 134 | 0.85 | 3.94 | 114 |
| Dec. 27 | C. M. O'Neil | 36 | 94 | 0.76 | 4.77 | 71 |

DAILY GAUGE HEIGHT AND DISCHARGE of Sturgeon River near Fort Saskatchewan, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.60 | 57*a* | 4.01 | 58 | 4.22 | 56 | 5.13 | 600 | 3.40 | 240 | 3.00 | 108 |
| 2 | 3.60 | 55 | 4.01 | 59 | 4.22 | 56 | 4.93 | 743*b* | 3.40 | 240 | 3.00 | 108 |
| 3 | 3.60 | 56 | 4.01 | 59 | 4.12 | 55 | 4.73 | 873 | 3.40 | 240 | 3.10 | 136 |
| 4 | 3.60 | 57 | 4.01 | 59 | 4.12 | 55 | 4.73 | 873 | 3.40 | 240 | 3.20 | 166 |
| 5 | 3.60 | 58 | 4.01 | 60 | 4.12 | 56 | 4.63 | 823 | 3.30 | 200 | 3.30 | 200 |
| 6 | 3.60 | 59 | 4.12 | 60 | 4.12 | 57 | 4.53 | 773 | 3.30 | 200 | 3.40 | 240 |
| 7 | 3.60 | 60 | 4.12 | 61 | 4.12 | 57 | 4.53 | 773 | 3.30 | 200 | 3.50 | 280 |
| 8 | 3.60 | 61 | 4.02 | 61 | 4.12 | 58 | 4.53 | 773 | 3.30 | 200 | 3.65 | 344 |
| 9 | 3.60 | 61 | 4.02 | 59 | 4.12 | 59 | 4.26 | 638 | 3.30 | 200 | 3.85 | 436 |
| 10 | 3.60 | 61 | 4.02 | 58 | 4.12 | 59 | 4.26 | 638 | 3.20 | 166 | 4.05 | 533 |
| 11 | 3.70 | 61 | 4.02 | 58 | 4.11 | 60 | 4.26 | 638 | 3.20 | 166 | 4.15 | 583 |
| 12 | 3.70 | 60 | 3.92 | 58 | 4.11 | 60 | 4.16 | 588 | 3.20 | 166 | 4.20 | 608 |
| 13 | 3.70 | 58 | 3.92 | 59 | 4.11 | 61 | 4.16 | 588 | 3.20 | 166 | 4.35 | 683 |
| 14 | 3.70 | 56 | 3.92 | 59 | 4.01 | 62 | 4.06 | 538 | 3.20 | 166 | 4.50 | 758 |
| 15 | 3.70 | 57 | 3.92 | 60 | 4.21 | 62 | 4.06 | 538 | 3.10 | 136 | 4.65 | 833 |
| 16 | 3.70 | 59 | 3.93 | 60 | 4.31 | 64 | 3.96 | 489 | 3.10 | 136 | 4.85 | 933 |
| 17 | 3.70 | 60 | 3.93 | 59 | 4.51 | 66 | 3.96 | 489 | 3.10 | 136 | 4.90 | 958 |
| 18 | 3.70 | 59 | 3.93 | 59 | 4.11 | 68 | 3.86 | 441 | 3.10 | 136 | 5.00 | 1,010 |
| 19 | 3.60 | 58 | 3.93 | 58 | 4.01 | 70 | 3.86 | 441 | 3.10 | 136 | 5.05 | 1,030*c* |
| 20 | 3.60 | 57 | 3.93 | 58 | 4.01 | 72 | 3.86 | 441 | 3.10 | 136 | 5.10 | 1,050 |
| 21 | 3.60 | 57 | 3.93 | 57 | 4.30 | 74 | 3.76 | 394 | 3.10 | 136 | 5.10 | 1,040 |
| 22 | 3.60 | 56 | 4.13 | 56 | 4.70 | 76 | 3.76 | 394 | 3.10 | 136 | 5.15 | 1,055 |
| 23 | 3.70 | 56 | 4.13 | 55 | 4.70 | 78 | 3.76 | 394 | 3.00 | 108 | 5.20 | 1,075 |
| 24 | 3.70 | 56 | 4.13 | 54 | 4.70 | 80 | 3.76 | 394 | 3.00 | 108 | 5.10 | 1,020 |
| 25 | 3.70 | 56 | 4.13 | 54 | 4.50 | 83 | 3.76 | 394 | 3.00 | 108 | 5.05 | 985 |
| 26 | 3.71 | 56 | 4.23 | 54 | 4.40 | 86 | 3.24 | 180 | 3.00 | 108 | 5.05 | 980 |
| 27 | 3.81 | 56 | 4.23 | 55 | 4.40 | 90 | 3.50 | 280 | 3.00 | 108 | 5.05 | 970 |
| 28 | 3.81 | 56 | 4.23 | 56 | 4.50 | 96*a* | 3.50 | 280 | 3.00 | 108 | 5.00 | 940 |
| 29 | 3.81 | 57 | ..... | ..... | 4.60 | 150*b* | 3.50 | 280 | 3.00 | 108 | 5.00 | 930 |
| 30 | 3.91 | 57 | ..... | ..... | 5.00 | 300 | 3.40 | 240 | 3.00 | 108 | 5.00 | 920*c* |
| 31 | 3.91 | 58 | ..... | ..... | 5 30 | 450 | ..... | ..... | 3.00 | 108 | ..... | ..... |

*a* to *a* Ice conditions.
*b* Ice breakup March 29 to April 2; discharge estimated.
*c* Shifting conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Sturgeon River near Fort Saskatchewan, for 1915. —*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 5.00 | 921 | 3.90 | 410 | 3.10 | 110 | 3.20 | 138 | 3.30 | 170 | 4.00 | 115 |
| 2 | 4.90 | 874 | 3.80 | 366 | 3.10 | 110 | 3.20 | 138 | 3.30 | 170 | 4.00 | 116 |
| 3 | 4.90 | 874 | 3.75 | 344 | 3.10 | 110 | 3.20 | 138 | 3.30 | 170 | 4.00 | 114 |
| 4 | 4.90 | 874 | 3.70 | 322 | 3.10 | 110 | 3.20 | 138 | 3.40 | 204 | 4.00 | 112 |
| 5 | 4.90 | 874 | 3.70 | 322 | 3.10 | 110 | 3.20 | 138 | 3.30 | 170 | 4.00 | 108 |
| 6 | 4.80 | 827 | 3.70 | 322 | 3.10 | 110 | 3.20 | 138 | 3.30 | 170 | 4.00 | 104 |
| 7 | 4.80 | 827 | 3.65 | 302 | 3.10 | 110 | 3.20 | 138 | 3.30 | 170 | 4.10 | 104 |
| 8 | 4.70 | 780 | 3.60 | 282 | 3.10 | 110 | 3.20 | 138 | 3.30 | 170 | 4.10 | 104 |
| 9 | 4.70 | 780 | 3.60 | 282 | 3.10 | 110 | 3.20 | 138 | 3.45 | 219*a* | 4.10 | 102 |
| 10 | 4.70 | 780 | 3.50 | 242 | 3.10 | 110 | 3.20 | 138 | 3.85 | 215*a* | 4.10 | 99 |
| 11 | 4.60 | 733 | 3.50 | 242 | 3.10 | 110 | 3.20 | 138 | 3.45 | 210*a* | 4.20 | 95 |
| 12 | 4.60 | 733 | 3.50 | 242 | 3.10 | 110 | 3.20 | 138 | 3.85 | 187*a* | 4.20 | 90 |
| 13 | 4.50 | 686 | 3.40 | 204 | 3.10 | 110 | 3.20 | 138 | 4.05 | 173*b* | 4.20 | 86 |
| 14 | 4.50 | 686 | 3.40 | 204 | 3.10 | 110 | 3.20 | 138 | 4.10 | 156 | 4.20 | 85 |
| 15 | 4.40 | 640 | 3.40 | 204 | 3.10 | 110 | 3.20 | 138 | 3.80 | 148 | 4.30 | 84 |
| 16 | 4.40 | 640 | 3.35 | 187 | 3.10 | 110 | 3.20 | 138 | 3.80 | 140 | 4.30 | 82 |
| 17 | 4.40 | 640 | 3.30 | 170 | 3.10 | 110 | 3.20 | 138 | 3.70 | 128 | 4.30 | 82 |
| 18 | 4.35 | 617 | 3.30 | 170 | 3.10 | 110 | 3.20 | 138 | 3.70 | 124 | 4.40 | 80 |
| 19 | 4.30 | 594 | 3.30 | 170 | 3.10 | 110 | 3.20 | 138 | 3.80 | 123 | 4.40 | 79 |
| 20 | 4.30 | 594 | 3.30 | 170 | 3.10 | 110 | 3.20 | 138 | 3.80 | 123 | 4.40 | 78 |
| 21 | 4.30 | 594 | 3.30 | 170 | 3.10 | 110 | 3.20 | 138 | 3.80 | 123 | 4.40 | 77 |
| 22 | 4.30 | 594 | 3.20 | 138 | 3.10 | 110 | 3.20 | 138 | 3.80 | 121 | 4.40 | 76 |
| 23 | 4.20 | 548 | 3.20 | 138 | 3.10 | 110 | 3.20 | 138 | 3.80 | 118 | 4.40 | 75 |
| 24 | 4.20 | 548 | 3.20 | 138 | 3.20 | 138 | 3.20 | 138 | 3.70 | 116 | 4.40 | 74 |
| 25 | 4.20 | 548 | 3.20 | 138 | 3.20 | 138 | 3.20 | 138 | 3.70 | 116 | 4.40 | 72 |
| 26 | 4.10 | 502 | 3.20 | 138 | 3.20 | 138 | 3.20 | 138 | 3.70 | 116 | 4.60 | 72 |
| 27 | 4.05 | 479 | 3.20 | 138 | 3.20 | 138 | 3.20 | 138 | 3.80 | 116 | 4.70 | 71 |
| 28 | 4.00 | 456 | 3.20 | 138 | 3.20 | 138 | 3.20 | 138 | 3.80 | 115 | 4.80 | 70 |
| 29 | 4.00 | 456 | 3.20 | 138 | 3.20 | 138 | 3.20 | 138 | 3.90 | 114 | 4.80 | 69 |
| 30 | 4.00 | 456 | 3.20 | 138 | 3.20 | 138 | 3.20 | 138 | 3.90 | 114 | 4.70 | 68 |
| 31 | 3.90 | 410 | 3.20 | 138 | ..... | ..... | 3.20 | 138 | ..... | ..... | 4.80 | 67 |

*a* Ice forming; discharge interpolated.
*b* Ice conditions.

MONTHLY DISCHARGE of Sturgeon River near Fort Saskatchewan, for 1915.

(Drainage area 1,330 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area | Total in Acre-feet. |
| January | 61 | 55 | 58 | 0.044 | 0.05 | 3,566 |
| February | 61 | 54 | 58 | 0.044 | 0.05 | 3,221 |
| March | 450 | 55 | 90 | 0.068 | 0.08 | 5,534 |
| April | 873 | 180 | 531 | 0.399 | 0.44 | 31,597 |
| May | 240 | 108 | 156 | 0.117 | 0.13 | 9,592 |
| June | 1,075 | 108 | 697 | 0.524 | 0.58 | 41,474 |
| July | 921 | 410 | 663 | 0.499 | 0.58 | 40,766 |
| August | 410 | 138 | 216 | 0.162 | 0.19 | 13,281 |
| September | 138 | 110 | 117 | 0.088 | 0.10 | 6,962 |
| October | 138 | 138 | 138 | 0.104 | 0.12 | 8,485 |
| November | 219 | 114 | 150 | 0.113 | 0.13 | 8,926 |
| December | 116 | 67 | 87 | 0.065 | 0.07 | 5,349 |
| The year | | | | | 2.52 | 178,753 |

NORTH SASKATCHEWAN RIVER AT BATTLEFORD.

*Location.*—North channel, SW. ¼ Sec. 33, Tp. 43, Rge. 16, W. 3rd Mer. South channel NE. ¼ Sec. 29, Tp. 43, Rge. 16, W. 3rd Mer.

*Records available.*—May 16, 1911, to December 31, 1915.

*Gauges.*—North channel: Chain; elevation of zero maintained at 1,512.30 feet since establishment. South channel: Chain; elevation of zero maintained at 1,511.88 feet since establishment.

*Bench-marks.*—North channel, on downstream side of left abutment. Elevation, 1,525.66 feet above mean sea level. (Department of Public Works, Canada.) South channel, permanent iron bench-mark on right bank. Elevation, 1,530,72 feet above mean sea level. (Department of Public Works, Canada.)

*Channel.*—Shifts considerably at high stages.

*Discharge measurements.*—From bridge.

*Observer.*—Harold W. Fisher.

DISCHARGE MEASUREMENTS of North Channel of North Saskatchewan River at Battleford, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 8 | F. R. Steinberger | 211 | 660 | 0.35 | 2.60 | 230 |
| Jan. 25 | do | 214 | 613 | 0.28 | 2.69 | 170 |
| Feb. 16 | E. W. W. Hughes | 201 | 567 | Plus | 2.71 | 12 |
| Mar. 2 | do | 192 | 549 | Nil. | 2.67 | Nil. |
| Mar. 18 | do | 167 | 573 | " | 2.77 | " |
| April 9-10 | do | 655 | 2,089 | 1.85 | 4.22 | 3,873 |
| May 5 | do | 251 | 979 | 1.63 | 2.45 | 1,593 |
| July 20-22 | F. K. Beach | 1,214 | 11,889 | 3.80 | 11.36 | 45,192 |
| Aug. 19 | do | 974 | 4,818 | 2.58 | 6.30 | 12,430 |
| Sept. 16-17 | do | 1,019 | 3,131 | 1.94 | 4.60 | 6,060 |
| Oct. 12-13 | do | 906 | 2,255 | 1.87 | 3.77 | 4,218 |
| Nov. 26 | F. R. Steinberger | 299 | 1,454 | 0.84 | 2.90 | 1,219 |
| Dec. 13 | do | 297 | 1,265 | 0.54 | 2.75 | 681 |
| Dec. 27 | do | 294 | 1,217 | 0.43 | 2.64 | 519 |

DAILY GAUGE HEIGHT AND DISCHARGE of North Channel of North Saskatchewan River at Battleford, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.10 | 220*b* | 2.80 | 160 | 2.75 | Nil | 4.95 | 4,500 | 2.80 | 1,900 | 5.68 | ..... |
| 2 | 2.25 | 230 | 2.80 | 150 | 2.72 | " | 4.90 | 4,780 | 2.70 | 1,800 | 5.70 | ..... |
| 3 | 2.30 | 215 | 2.80 | 145 | 2.74 | " | 4.82 | 5,020 | 2.52 | 1,620 | 5.76 | ..... |
| 4 | 2.40 | 225 | 2.82 | 135 | 2.76 | " | 4.75 | 5,150*b* | 2.50 | 1,600 | 5.83 | ..... |
| 5 | 2.55 | 235 | 2.82 | 130 | 2.75 | " | 4.90 | 5,540 | 2.45 | 1,560 | 5.90 | ..... |
| 6 | 2.65 | 225 | 2.80 | 120 | 2.75 | " | 4.83 | 5,360 | 2.42 | 1,540 | 6.01 | ..... |
| 7 | 2.60 | 220 | 2.77 | 110 | 2.75 | " | 4.80 | 5,280 | 2.40 | 1,520 | 6.10 | ..... |
| 8 | 2.62 | 230 | 2.75 | 90 | 2.75 | " | 4.49 | 4,480 | 2.45 | 1,560 | 6.20 | ..... |
| 9 | 2.64 | 260 | 2.76 | 75 | 2.80 | " | 4.07 | 3,640 | 2.60 | 1,700 | 6.32 | ..... |
| 10 | 2.68 | 320 | 2.75 | 60 | 2.77 | " | 5.60 | 7,780 | 2.89 | 1,990 | 6.45 | ..... |
| 11 | 2.70 | 325 | 2.75 | 45 | 2.75 | " | 5.35 | 6,920 | 3.00 | ..... | 6.68 | ..... |
| 12 | 2.70 | 325 | 2.73 | 35 | 2.75 | " | 4.00 | 3,500 | 3.15 | ..... | 7.25 | ..... |
| 13 | 2.68 | 320 | 2.70 | 20 | 2.75 | " | 3.91 | 3,360 | 3.30 | ..... | 9.55 | ..... |
| 14 | 2.71 | 330 | 2.68 | 15 | 2.75 | " | 3.80 | 3,180 | 3.42 | ..... | 9.30 | ..... |
| 15 | 2.71 | 335 | 2.73 | 15 | 2.75 | " | 3.65 | 2,940 | 3.60 | ..... | 9.35 | ..... |
| 16 | 2.73 | 340 | 2.74 | 13 | 2.75 | " | 3.32 | 2,480 | 3.62 | ..... | 9.34 | ..... |
| 17 | 2.73 | 360 | 2.75 | 15 | 2.78 | " | 3.25 | 2,400 | 3.65 | ..... | 9.18 | ..... |
| 18 | 2.73 | 380 | 2.75 | 15 | 2.85 | " | 3.10 | 2,220 | 3.78 | ..... | 9.10 | ..... |
| 19 | 2.70 | 360 | 2.77 | 30 | 2.85 | " | 2.95 | 2,050 | 3.90 | ..... | 8.95 | ..... |
| 20 | 2.71 | 365 | 2.80 | 160 | 2.85 | " | ..... | 1,940 | 4.01 | ..... | 8.72 | ..... |
| 21 | 2.75 | 360 | 2.90 | 230 | 2.85 | " | 2.73 | 1,830 | 4.25 | ..... | 8.50 | ..... |
| 22 | 2.73 | 340 | 3.15 | 280 | ..... | " | 2.67 | 1,770 | 4.57 | ..... | 8.28 | ..... |
| 23 | 2.73 | 230 | 3.25 | 310 | ..... | " | 2.65 | 1,750 | 5.07 | ..... | 7.97 | ..... |
| 24 | 2.73 | 230 | 3.32 | 330 | 2.86 | " | 2.62 | 1,720 | 5.55 | ..... | 7.60 | ..... |
| 25 | 2.69 | 170 | 3.30 | 330 | 2.86 | " | 2.60 | 1,700 | 5.52 | ..... | 7.32 | ..... |
| 26 | 2.70 | 170 | 3.06 | 260 | 2.90 | 40 | 2.60 | 1,700 | 5.50 | ..... | 7.09 | ..... |
| 27 | 2.72 | 170 | 3.00 | 180 | 3.10 | 330 | 2.55 | 1,650 | 5.55 | ..... | 6.96 | ..... |
| 28 | 2.75 | 170 | 2.80 | 80 | 3.20 | 520 | 2.60 | 1,700 | 5.57 | ..... | 6.90 | ..... |
| 29 | 2.75 | 170 | ..... | ..... | 3.55 | 960 | ..... | 1,900 | 5.59 | ..... | 8.02*a* | ..... |
| 30 | 2.79 | 170 | ..... | ..... | 4.02 | 1,620 | 3.00 | 2,100 | 5.60 | ..... | 15,08*a* | ..... |
| 31 | 2.80 | 165 | ..... | ..... | 4.90 | 3,900 | ..... | ..... | 5.65 | ..... | ..... | ..... |

*a* Mean gauge height from frequent readings. Maximum gauge height June 30, 15.60.
*b* to *b* Ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of North Channel of North Saskatchewan River at Battleford, for 1915—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 13.42*a* | ..... | 7.48 | ..... | 6.55 | ..... | 3.95 | ..... | 2.97 | ..... | 3.25 | 1,200 |
| 2 | 11.21*a* | ..... | 7.37 | ..... | 6.28 | ..... | 3.90 | ..... | 2.96 | ..... | 3.20 | 1,200 |
| 3 | 10.46 | ..... | 7.67 | ..... | 6.17 | ..... | 3.82 | ..... | 2.92 | ..... | 3.20 | 1,195 |
| 4 | 10.38 | ..... | 7.49 | ..... | 6.17 | ..... | 3.75 | ..... | 2.89 | ..... | 3.15 | 1,180 |
| 5 | 10.34 | ..... | 7.52 | ..... | 5.99 | ..... | 3.73 | ..... | 2.85 | ..... | 3.14 | 1,160 |
| 6 | 9.40 | ..... | 7.63 | ..... | 5.85 | ..... | 3.70 | ..... | .... | ..... | 3.10 | 1,120 |
| 7 | 8.75 | ..... | 7.58 | ..... | 5.75 | ..... | 3.75 | ..... | 2.87 | ..... | 3.05 | 1,080 |
| 8 | 8.45 | ..... | 7.45 | ..... | 5.55 | ..... | 3.77 | ..... | 2.85 | ..... | 3.05 | 1,040 |
| 9 | 8.40 | ..... | 7.40 | ..... | 5.37 | ..... | 3.78 | ..... | 3.82 | ..... | 3.01 | 1,000 |
| 10 | 8.38 | ..... | 7.35 | ..... | 5.20 | ..... | 3.80 | ..... | 2.80 | ..... | 3.00 | 970 |
| 11 | 8.25 | ..... | 6.96 | ..... | 5.40 | ..... | 3.82 | ..... | 2.81 | ..... | 2.95 | 890 |
| 12 | 8.10 | ..... | 6.80 | ..... | 5.27 | ..... | 3.82 | ..... | 2.80 | ..... | 2.90 | 830 |
| 13 | 8.05 | ..... | 6.78 | ..... | 5.14 | ..... | 3.74 | ..... | 2.85 | ..... | 2.75 | 680 |
| 14 | 7.80 | ..... | 6.70 | ..... | 4.93 | ..... | 3.70 | ..... | 3.85 | ..... | 2.70 | 620 |
| 15 | 7.72 | ..... | 6.60 | ..... | 4.80 | ..... | 3.63 | ..... | 3.13 | ..... | 2.68 | 610 |
| 16 | 7.68 | ..... | 6.50 | ..... | 4.64 | ..... | 3.58 | ..... | 3.10 | ..... | 2.70 | 600 |
| 17 | 7.46 | ..... | 6.45 | ..... | 4.54 | ..... | 3.50 | ..... | 3.10 | ..... | 2.70 | 600 |
| 18 | 10.60 | ..... | 6.39 | ..... | 4.34 | ..... | 3.45 | ..... | 3.09 | ..... | 2.70 | 600 |
| 19 | 12.33 | ..... | 6.33 | ..... | 4.25 | ..... | 3.40 | ..... | 3.07 | ..... | 2.70 | 600 |
| 20 | 11.60 | ..... | 6.29 | ..... | 4.15 | ..... | 3.35 | ..... | 3.05 | ..... | 2.68 | 590 |
| 21 | 11.44 | ..... | 6.26 | ..... | 4.10 | ..... | 3.31 | ..... | 3.05 | ..... | 2.68 | 580 |
| 22 | 11.10 | ..... | 6.25 | ..... | 4.05 | ..... | 3.25 | ..... | 3.05 | ..... | 2.66 | 550 |
| 23 | 10.46 | ..... | 6.30 | ..... | 4.00 | ..... | 3.05 | ..... | 3.05 | ..... | 2.65 | 530 |
| 24 | 10.05 | ..... | 7.58 | ..... | 3.97 | ..... | 3.02 | ..... | 3.00 | ..... | 2.65 | 520 |
| 25 | 9.35 | ..... | 8.90 | ..... | 4.03 | ..... | 3.00 | ..... | 2.95 | ..... | ..... | 520 |
| 26 | 9.05 | ..... | 8.50 | ..... | 4.07 | ..... | 3.05 | ..... | 2.95 | ..... | 2.65 | 520 |
| 27 | 8.92 | ..... | 7.80 | ..... | 4.05 | ..... | 3.06 | ..... | 3.05 | ..... | 2.64 | 520 |
| 28 | 8.57 | ..... | 7.32 | ..... | 3.98 | ..... | 3.08 | ..... | 3.20 | ..... | 2.64 | 515 |
| 29 | 8.22 | ..... | 7.14 | ..... | 3.95 | ..... | 3.05 | ..... | 3.20 | ..... | 2.64 | 515 |
| 30 | 7.96 | ..... | 6.96 | ..... | 3.90 | ..... | 3.03 | ..... | 3.20 | ..... | 2.64 | 515 |
| 31 | 7.70 | ..... | 6.90 | ..... | ..... | ..... | 3.00 | ..... | ..... | ..... | 2.64 | 515 |

*a* Mean gauge height from frequent readings.

MONTHLY DISCHARGE of North Channel of North Saskatchewan River at Battleford, for 1915.

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 380 | 165 | 263 | | | 16,171 |
| February | 330 | 13 | 126 | | | 6,998 |
| March | 3,900 | Nil | 238 | | | 14,634 |
| April | 7,780 | 1,650 | 3,345 | | | 199,041 |
| May (1–10) | 1,990 | 1,520 | 1,679 | | | 33,302 |
| June | | | | | | |
| July | | | | | | |
| August | | | | | | |
| September | | | | | | |
| October | | | | | | |
| November | | | | | | |
| December | 1,200 | 515 | 760 | | | 46,731 |
| The period | | | | | | 316,877 |

DISCHARGE MEASUREMENTS of South Channel of North Saskatchewan River at Battleford, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 9 | F. R. Steinberger | 138 | 942 | 1.62 | 4.54 | 1,525 |
| Jan. 26–27 | do | 134 | 817 | 1.52 | 4.50 | 1,243 |
| Feb. 16 | E. W. W. Hughes | 140 | 873 | 1.52 | 4.70 | 1,335 |
| Mar. 2 | do | 141 | 865 | 1.44 | 4.71 | 1,274 |
| Mar. 18 | do | 143 | 859 | 1.45 | 4.68 | 1,248 |
| April 8 | do | 401 | 3,722 | 1.27 | 5.70 | 4,738 |
| May 5 | do | 363 | 1,853 | 1.70 | 4.15 | 3,158 |
| July 17 | F. K Beach | 540 | 4,441 | 2.75 | 8.24 | 12,213 |
| Aug. 20 | do | 510 | 3,150 | 3.01 | 6.92 | 9,481 |
| Sept. 17 | do | 303 | 2,152 | 2.59 | 5.04 | 5,552 |
| Oct. 13 | do | 297 | 1,550 | 2.78 | 4.47 | 4,304 |
| Nov. 27 | F. R. Steinberger | 365 | 1,218 | 0.89 | 4.56 | 1,085 |
| Dec. 14 | do | 178 | 944 | 1.19 | 4.43 | 1,120 |
| Dec. 28 | do | 175 | 796 | 1.31 | 4.14 | 1,044 |

DAILY GAUGE HEIGHT AND DISCHARGE of South Channel of North Saskatchewan River at Battleford, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.90 | 1,500*b* | 4.68 | 1,340 | 4.75 | 1,280 | 5.90 | 4,530 | 4.90 | 3,770 | 6.95 | ..... |
| 2 | 3.91 | 1,515 | 4.68 | 1,350 | 4.75 | 1,275 | 5.84 | 4,640 | 4.75 | 3,650 | 6.98 | ..... |
| 3 | 3.97 | 1,490 | 4.68 | 1,350 | 4.75 | 1,280 | 5.76 | 4,690 | 4.35 | 3,330 | 7.04 | ..... |
| 4 | 4.00 | 1,495 | 4.67 | 1,340 | 4.77 | 1,280 | 5.69 | 4,750*b* | 4.25 | 3,250 | 7.10 | ..... |
| 5 | 4.20 | 1,520 | 4.65 | 1,335 | 4.77 | 1,285 | 5.85 | 5,010 | 4.20 | 3,210 | 7.15 | ..... |
| 6 | 4.39 | 1,525 | 4.65 | 1,340 | 4.80 | 1,300 | 5.70 | 4,770 | 4.15 | 3,170 | 7.25 | ..... |
| 7 | 4.47 | 1,510 | 4.69 | 1,350 | 4.78 | 1,320 | 5.65 | 4,690 | 4.13 | 3,154 | 7.36 | ..... |
| 8 | 4.47 | 1,510 | 4.70 | 1,360 | 4.80 | 1,340 | 5.63 | 4,660 | 4.20 | 3,210 | 7.47 | ..... |
| 9 | 4.55 | 1,525 | 4.71 | 1,370 | 4.85 | 1,365 | 5.40 | 4,330 | 4.32 | 3,306 | 7.60 | ..... |
| 10 | 4.57 | 1,540 | 4.73 | 1,365 | 4.85 | 1,365 | 6.75 | 7,025 | 4.57 | 3,506 | 7.75 | ..... |
| 11 | 4.60 | 1,555 | 4.73 | 1,360 | 4.82 | 1,350 | 6.55 | 6,485 | 4.61 | ..... | 7.95 | ..... |
| 12 | 4.58 | 1,545 | 4.73 | 1,360 | 4.80 | 1,345 | 5.45 | 4,390 | 4.74 | ..... | 9.22 | ..... |
| 13 | 4.58 | 1,520 | 4.74 | 1,350 | 4.80 | 1,340 | 5.35 | 4,270 | 4.85 | ..... | 10.20 | ..... |
| 14 | 4.55 | 1,480 | 4.75 | 1,345 | 4.80 | 1,340 | 5.26 | 4,162 | 4.95 | ..... | 10.02 | ..... |
| 15 | 4.52 | 1,440 | 4.75 | 1,340 | 4.80 | 1,335 | 5.00 | 3,850 | 5.10 | ..... | 10.10 | ..... |
| 16 | 4.52 | 1,420 | 4.75 | 1,335 | 4.80 | 1,325 | 4.68 | 3,594 | 5.12 | ..... | 10.10 | ..... |
| 17 | 4.50 | 1,410 | 4.75 | 1,340 | 4.75 | 1,290 | 4.63 | 3,554 | 5.15 | ..... | 9.96 | ..... |
| 18 | 4.50 | 1,400 | 4.75 | 1,340 | 4.68 | 1,250 | 4.58 | 3,514 | 5.18 | ..... | 9.95 | ..... |
| 19 | 4.52 | 1,400 | 4.77 | 1,345 | 4.68 | 1,250 | 4.55 | 3,490 | 5.20 | ..... | 9.81 | ..... |
| 20 | 4.55 | 1,400 | 4.80 | 1,350 | 4.68 | 1,255 | ..... | 3,450 | 5.29 | ..... | 9.60 | ..... |
| 21 | 4.55 | 1,370 | 4.75 | 1,350 | 4.68 | 1,260 | 4.43 | 3,394 | 5.52 | ..... | 9.38 | ..... |
| 22 | 4.50 | 1,335 | 4.75 | 1,340 | ..... | 1,270 | 4.38 | 3,354 | 5.85 | ..... | 9.15 | ..... |
| 23 | 4.50 | 1,300 | 4.75 | 1,335 | ..... | 1,280 | 4.37 | 3,346 | 6.34 | ..... | 8.85 | ..... |
| 24 | 4.50 | 1,270 | 4.75 | 1,325 | 4.75 | 1,290 | 4.35 | 3,330 | 6.84 | ..... | 8.50 | ..... |
| 25 | 4.50 | 1,240 | 4.75 | 1,320 | 4.78 | 1,310 | 4.35 | 3,330 | 6.80 | ..... | 8.35 | ..... |
| 26 | 4.50 | 1,240 | 4.80 | 1,310 | 4.78 | 1,310 | 4.32 | 3,306 | 6.78 | ..... | 8.20 | ..... |
| 27 | 4.60 | 1,245 | 4.77 | 1,300 | 4.80 | 1,310 | 4.30 | 3,290 | 6.78 | ..... | 8.12 | ..... |
| 28 | 4.62 | 1,260 | 4.75 | 1,290 | 4.95 | 1,530 | 4.40 | 3,370 | 6.84 | ..... | 8.05 | ..... |
| 29 | 4.65 | 1,280 | ..... | ..... | 5.20 | 2,265 | ..... | 3,590*c* | 6.85 | ..... | 9.04*a* | ..... |
| 30 | 4.65 | 1,290 | ..... | ..... | 5.58 | 3,250 | 4.95 | 3,810 | 6.85 | ..... | 15.21*a* | ..... |
| 31 | 4.67 | 1,315 | ..... | ..... | 5.95 | 4,390 | ..... | ..... | 6.91 | ..... | ..... | ..... |

*a* Mean gauge height from frequent readings. Maximum gauge height June 30, 15.80.
*b–b* Ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of South Channel of North Saskatchewan River, at Battleford, for 1915—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 14.24*a* | ..... | 8.15 | ..... | 7.12 | ..... | 4.50 | ..... | 3.66 | ..... | 4.80 | 1,100 |
| 2 | 11.73*a* | ..... | 8.03 | ..... | 6.85 | ..... | 4.47 | ..... | 3.68 | ..... | 4.80 | 1,110 |
| 3 | 11.04 | ..... | 8.32 | ..... | 6.75 | ..... | 4.40 | ..... | 3.64 | ..... | 4.78 | 1,115 |
| 4 | 11.02 | ..... | 8.14 | ..... | 6.68 | ..... | 4.33 | ..... | 3.61 | ..... | 4.75 | 1,120 |
| 5 | 11.01 | ..... | 8.16 | ..... | 6.55 | ..... | 4.35 | ..... | 3.60*b* | ..... | 4.75 | 1,125 |
| 6 | 10.40 | ..... | 8.25 | ..... | 6.45 | ..... | 4.30 | ..... | ..... | ..... | 4.72 | 1,130 |
| 7 | 9.73 | ..... | 8.20 | ..... | 6.37 | ..... | 4.37 | ..... | 3.70 | ..... | 4.70 | 1,130 |
| 8 | 9.40 | ..... | 8.07 | ..... | 6.22 | ..... | 4.40 | ..... | 3.87 | ..... | 4.67 | 1,130 |
| 9 | 9.35 | ..... | 8.00 | ..... | 6.08 | ..... | 4.42 | ..... | 3.85 | ..... | 4.65 | 1,135 |
| 10 | 9.34 | ..... | 7.95 | ..... | 5.95 | ..... | 4.45 | ..... | 3.57 | ..... | 4.62 | 1,135 |
| 11 | 9.21 | ..... | 7.55 | ..... | 5.95 | ..... | 4.51 | ..... | 3.55 | ..... | 4.60 | 1,130 |
| 12 | 9.00 | ..... | 7.47 | ..... | 5.80 | ..... | 4.58 | ..... | 3.55 | ..... | 4.59 | 1,130 |
| 13 | 8.90 | ..... | 7.46 | ..... | 5.65 | ..... | 4.47 | ..... | 3.52 | ..... | 4.50 | 1,125 |
| 14 | 8.66 | ..... | 7.41 | ..... | 5.52 | ..... | 4.40 | ..... | 4.60 | ..... | 4.44 | 1,120 |
| 15 | 8.56 | ..... | 7.32 | ..... | 5.37 | ..... | 4.34 | ..... | 4.48 | ..... | 4.35 | 1,120 |
| 16 | 8.55 | ..... | 7.25 | ..... | 5.21 | ..... | 4.28 | ..... | 4.45 | ..... | 4.35 | 1,100 |
| 17 | 8.24 | ..... | 7.05 | ..... | 5.04 | ..... | 4.19 | ..... | 4.42 | ..... | 4.32 | 1,080 |
| 18 | 11.50 | ..... | 6.94 | ..... | 4.88 | ..... | 4.15 | ..... | 4.42 | ..... | 4.30 | 1,070 |
| 19 | 13.20 | ..... | 6.90 | ..... | 4.80 | ..... | 4.10 | ..... | 4.40 | ..... | 4.30 | 1,060 |
| 20 | 12.26 | ..... | 6.92 | ..... | 4.75 | ..... | 4.05 | ..... | 4.38 | ..... | 4.28 | 1,060 |
| 21 | 12.17 | ..... | 6.90 | ..... | 4.70 | ..... | 4.00 | ..... | 4.39 | ..... | 4.25 | 1,055 |
| 22 | 11.82 | ..... | 6.88 | ..... | 4.65 | ..... | 3.96 | ..... | 4.38 | ..... | 4.25 | 1,055 |
| 23 | 10.96 | ..... | 6.95 | ..... | 4.60 | ..... | 3.75 | ..... | 4.45 | ..... | 4.20 | 1,055 |
| 24 | 10.55 | ..... | 8.29 | ..... | 4.56 | ..... | 3.72 | ..... | 4.38 | ..... | 4.20 | 1,050 |
| 25 | 10.05 | ..... | 9.59 | ..... | 4.60 | ..... | 3.71 | ..... | 4.37 | ..... | ..... | 1,050 |
| 26 | 9.76 | ..... | 9.15 | ..... | 4.64 | ..... | 3.75 | ..... | 4.35 | ..... | 4.15 | 1,045 |
| 27 | 9.55 | ..... | 8.40 | ..... | 4.62 | ..... | 3.78 | ..... | 4.56 | ..... | 4.15 | 1,045 |
| 28 | 9.18 | ..... | 7.90 | ..... | 4.55 | ..... | 3.80 | ..... | 4.79 | ..... | 4.14 | 1,045 |
| 29 | 8.86 | ..... | 7.72 | ..... | 4.51 | ..... | 3.76 | ..... | ..... | ..... | 4.14 | 1,045 |
| 30 | 8.62 | ..... | 7.53 | ..... | 4.47 | ..... | 3.73 | ..... | ..... | ..... | 4.15 | 1,050 |
| 31 | 8.36 | ..... | 7.47 | ..... | ..... | ..... | 3.69 | ..... | ..... | ..... | 4.13 | 1,055*b* |

*a* Mean gauge height and discharge from frequent readings.
*b* to *b* Ice conditions.

MONTHLY DISCHARGE of South Channel of North Saskatchewan River at Battleford, for 1915.

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 1,555 | 1,240 | 1,414 | | | 86,944 |
| February | 1,370 | 1,290 | 1,341 | | | 74,475 |
| March | 4,390 | 1,250 | 1,504 | | | 92,477 |
| April | 7,025 | 3,290 | 4,132 | | | 245,930 |
| May (1-10) | 3,770 | 3,154 | 3,356 | | | 66,565 |
| June | | | | | | |
| July | | | | | | |
| August | | | | | | |
| September | | | | | | |
| October | | | | | | |
| November | | | | | | |
| December | 1,135 | 1,045 | 1,090 | | | 67,022 |
| The period | | | | | | 633,413 |

NOTE. The following corrections should be made in the table of monthly discharge of the South Channel of the North Saskatchewan River at Battleford, for 1914:—The total run-off for the month of June should be 842,240 acre-feet, not 1,040,592 acre-feet, and the total run-off for the year should be 3,779,519 acre-feet.

MONTHLY DISCHARGE of North Saskatchewan River at Battleford, for 1915.

(Drainage area 27,100 (a) square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 1,880 | 1,410 | 1,677 | 0.0619 | 0.07 | 103,115 |
| February | 1,655 | 1,348 | 1,467 | 0.0541 | 0.06 | 81,473 |
| March | 8,290 | 1,250 | 1,742 | 0.0643 | 0.07 | 107,112 |
| April | 14,805 | 4,940 | 7,477 | 0.2759 | 0.31 | 444,971 |
| May (1-10) | 5,670 | 4,674 | 5,035 | 0.1858 | 0.21 | 99,867 |
| June | ..... | ..... | ..... | ..... | ..... | ..... |
| July | ..... | ..... | ..... | ..... | ..... | ..... |
| August | ..... | ..... | ..... | ..... | ..... | ..... |
| September | ..... | ..... | ..... | ..... | ..... | ..... |
| October | ..... | ..... | ..... | ..... | ..... | ..... |
| November | ..... | ..... | ..... | ..... | ..... | ..... |
| December | 2,300 | 1,560 | 1,850 | 0.0683 | 0.08 | 113,753 |
| The period | ..... | ..... | ..... | ..... | 0.80 | 959,179 |

*a* The drainage area given in this table is only approximate. It must be remembered that the greater part of the run-off at this station is derived from the eastern slope of the Rocky Mountains and must not be used to base estimates of run-off on other streams in the vicinity of Battleford.

No discharge estimates are made for dates between May 10, 1915 and December 1, 1915, owing to rapidly shifting conditions in the channels, and to the fact that measurements were not secured frequently enough to follow changes which it is believed occurred owing to unusually high stages.

## PIGEON CREEK NEAR WESTEROSE.

*Location.*—On the SE. ¼ Sec. 15, Tp. 46, Rge. 28, W. 4th Mer., at the traffic bridge near outlet of Pigeon Lake and on the trail from Wetaskiwin to Westerose post office.

*Records available.*—Discharge measurements only made during 1912, 1913 and 1914. Gauge readings every three days March 24, 1915, to October 31, 1915, and records computed for that period.

*Gauge.*—Vertical staff spiked to a post in creek on downstream side of bridge. Zero elevation maintained at 93.36 feet.

*Bench-mark.*—On a spike in a pile at the SW. corner of the bridge; assumed elevation 100.00 feet. Permanent iron bench-mark at SW. corner of bridge. Elevation, 100.23 feet.

*Channel.*—Permanent, sand and gravel.

*Discharge measurements.*—Made by wading near the bridge.

*Winter flow.*—The creek is partly open all winter and measurements are made by wading.

*Artificial control.*—Dam at outlet of lake fitted with two gates and a fishway. Owing to logs lodging in the creek below the dam, the control was changed in July.

*Observer.*—L. J. Wood, appointed March 24, and took readings at intervals of two or three days. All intermediate gauge heights were interpolated from the observed readings. Gauge readings were discontinued on October 31, 1915.

DISCHARGE MEASUREMENTS of Pigeon Creek near Westerose, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 7 | H. B. R. Thompson | 18.0 | 10.7 | 1.57 | 3.14 | 16.8 |
| Jan. 24 | do | 18.3 | 13.5 | 1.32 | 3.17 | 17.7 |
| Feb. 25 | do | 17.4 | 11.5 | 1.37 | 3.05 | 15.8 |
| Mar. 12 | do | 17.1 | 10.4 | 1.33 | 3.00 | 13.8 |
| Mar. 23 | J. M. Paul | 17.0 | 9.6 | 1.26 | 3.00 | 12.0 |
| April 20 | I. R. Strome | 18.0 | 13.1 | 1.50 | 2.99 | 19.6 |
| May 7 | do | 17.7 | 9.3 | 1.44 | 2.91 | 13.4 |
| May 28 | do | 20.0 | 17.5 | 1.54 | 3.28 | 27.0 |
| June 15 | do | 21.0 | 18.4 | 1.46 | 3.28 | 27.0 |
| July 14 | do | 46.0 | 88.0 | 1.14 | 5.13 | 100.0 |
| Aug. 30 | do | 16.0 | 7.9 | 0.85 | 2.91 | 6.7 |
| Sept. 19 | do | 17.0 | 8.6 | 1.06 | 2.97 | 9.2 |
| Oct. 4 | do | 16.0 | 6.2 | 0.88 | 2.80 | 5.5 |
| Oct. 21 | do | 12.0 | 4.2 | 0.80 | 2.72 | 3.4 |

DAILY GAUGE HEIGHT AND DISCHARGE of Pigeon Creek near Westerose, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | | | 3.05*a* | 15.0 | 3.14*a* | 22.0 | 3.16*a* | 23.0 |
| 2 | | | 3.05 | 15.4 | 3.15 | 23.0 | 3.10*a* | 21.0 |
| 3 | | | 3.05*a* | 15.6 | 3.15*a* | 23.0 | 3.06*a* | 20.0 |
| 4 | | | 3.05*a* | 16.0 | 3.15*a* | 23.0 | 3.02*a* | 18.7 |
| 5 | | | 3.05*a* | 16.2 | 3.16*a* | 23.0 | 2.98 | 17.5 |
| 6 | | | 3.05*a* | 16.4 | 3.16 | 23.0 | 3.04*a* | 19.3 |
| 7 | | | 3.05 | 16.6 | 3.07*a* | 20.0 | 3.10*a* | 21.0 |
| 8 | | | 3.05*a* | 17.0 | 2.98 | 17.5 | 3.16*a* | 23.0 |
| 9 | | | 3.05 | 17.2 | 2.98*a* | 17.5 | 3.22*a* | 25.0 |
| 10 | | | 3.04*a* | 17.2 | 2.97*a* | 17.2 | 3.28 | 27.0 |
| 11 | | | 3.04*a* | 17.6 | 2.97*a* | 17.2 | 3.38*a* | 30.0 |
| 12 | | | 3.03*a* | 17.4 | 2.96*a* | 16.9 | 3.48 | 34.0 |
| 13 | | | 3.02 | 17.2 | 2.95 | 16.6 | 3.40*a* | 31.0 |
| 14 | | | 3.02*a* | 17.6 | 3.00*a* | 18.1 | 3.32*a* | 28.0 |
| 15 | | | 3.01*a* | 17.6 | 3.05 | 19.7 | 3.23 | 25.0 |
| 16 | | | 3.00*a* | 17.6 | 3.00*a* | 18.1 | 3.24*a* | 26.0 |
| 17 | | | 3.00 | 17.7 | 2.95 | 16.6 | 3.25*a* | 26.0 |
| 18 | | | 3.00*a* | 17.8 | 2.90*a* | 15.2 | 3.26 | 26.0 |
| 19 | | | 2.99*a* | 17.5 | 2.85 | 13.7 | 3.27*a* | 27.0 |
| 20 | | | 2.99 | 17.6 | 2.87*a* | 14.3 | 3.28*a* | 27.0 |
| 21 | | | 2.99*a* | 17.8 | 2.89*a* | 14.9 | 3.30*a* | 28.0 |
| 22 | | | 2.98 | 17.5 | 2.92 | 15.8 | 3.32*a* | 28.0 |
| 23 | | | 3.04*a* | 19.3 | 2.96*a* | 16.9 | 3.34*a* | 29.0 |
| 24 | 3.00 | 12.0 | 3.10 | 21.0 | 3.00*a* | 18.1 | 3.35 | 29.0 |
| 25 | 3.00*a* | 12.2 | 3.10*a* | 21.0 | 3.04*a* | 19.3 | 3.47*a* | 34.0 |
| 26 | 3.01*a* | 12.4 | 3.10*a* | 21.0 | 3.08*a* | 21.0 | 3.58 | 37.0 |
| 27 | 3.02*a* | 13.2 | 3.10*a* | 21.0 | 3.12 | 22.0 | 3.67*a* | 41.0 |
| 28 | 3.03 | 13.6 | 3.10*a* | 21.0 | 3.20*a* | 24.0 | 3.76*a* | 44.0 |
| 29 | 3.04*a* | 14.0 | 3.10 | 21.0 | 3.29 | 27.0 | 3.85*a* | 48.0 |
| 30 | 3.04*a* | 14.4 | 3.12*a* | 22.0 | 3.24 | 26.0 | 3.93 | 51.0 |
| 31 | 3.05 | 14.8 | | | 3.20*a* | 24.0 | | |

*a* Gauge height interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of Pigeon Creek near Westerose, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet* | *Sec.-ft.* |
| 1 | 4.08*a* | 54 | 5.35*a* | 110 | 2.84 | 6.8 | 2.81*a* | 5.9 |
| 2 | 4.22*a* | 62 | 5.33 | 109 | 2.80*a* | 5.6 | 2.81*a* | 5.9 |
| 3 | 4.31 | 66 | 5.33 | 109 | 2.77 | 4.8 | 2.81 | 5.9 |
| 4 | 4.20*a* | 61 | 5.33*a* | 109 | 2.77 | 4.8 | 2.77*a* | 4.8 |
| 5 | 4.10*a* | 57 | 5.32 | 108 | 2.77*a* | 4.8 | 2.73*a* | 3.8 |
| 6 | 4.00*a* | 54 | 5.30*a* | 108 | 2.77*a* | 4.8 | 2.68 | 2.5 |
| 7 | 3.89 | 49 | 5.28 | 107 | 2.77 | 4.8 | 2.70*a* | 3.0 |
| 8 | 4.30*a* | 65 | 5.25*a* | 105 | 2.77*a* | 4.8 | 2.72*a* | 3.5 |
| 9 | 4.70*a* | 82 | 5.23 | 104 | 2.77 | 4.8 | 2.75 | 4.3 |
| 10 | 5.08 | 98 | 4.70*a* | 81 | 2.79*a* | 5.3 | 2.74*a* | 4.0 |
| 11 | 5.08 | 98 | 4.19 | 59 | 2.81*a* | 5.9 | 2.74 | 4.0 |
| 12 | 5.10*a* | 99 | 4.16*a* | 58 | 2.83*a* | 6.5 | 2.74*a* | 4.0 |
| 13 | 5.12*a* | 100 | 4.12*a* | 56 | 2.85*a* | 7.1 | 2.74*a* | 4.0 |
| 14 | 5.13 | 100 | 4.08 | 54 | 2.87*a* | 7.7 | 2.73*a* | 3.8 |
| 15 | 5.21*a* | 104 | 3.80*a* | 42 | 2.88 | 8.0 | 2.73*a* | 3.8 |
| 16 | 5.30 | 108 | 3.52*a* | 31 | 2.91*a* | 8.9 | 2.73 | 3.8 |
| 17 | 5.36*a* | 110 | 3.24*a* | 20 | 2.94*a* | 10.0 | 2.70*a* | 3.0 |
| 18 | 5.42 | 113 | 2.98 | 11.3 | 2.96 | 10.6 | 2.68*a* | 2.5 |
| 19 | 5.44*a* | 114 | 2.99*a* | 11.7 | 2.97*a* | 10.0 | 2.65 | 1.8 |
| 20 | 5.46 | 115 | 3.00*a* | 12.0 | 2.90*a* | 8.6 | 2.68*a* | 2.5 |
| 21 | 5.46*a* | 115 | 3.01 | 12.4 | 2.83 | 6.5 | 2.72*a* | 3.5 |
| 22 | 5.47*a* | 115 | 2.95 | 10.3 | 2.83*a* | 6.5 | 2.68 | 2.5 |
| 23 | 5.47 | 115 | 2.94*a* | 10.0 | 2.83*a* | 6.5 | 2.69 | 2.8 |
| 24 | 5.44*a* | 114 | 2.93*a* | 9.6 | 2.83 | 6.5 | 2.70*a* | 3.0 |
| 25 | 5.42*a* | 113 | 2.91*a* | 8.9 | 2.82*a* | 6.2 | 2.70*a* | 3.0 |
| 26 | 5.40*a* | 112 | 2.90*a* | 8.6 | 2.81*a* | 5.9 | 2.70*a* | 3.0 |
| 27 | 5.37 | 111 | 2.89 | 8.3 | 2.80 | 5.6 | 2.71 | 3.3 |
| 28 | 5.37*a* | 111 | 2.90*a* | 8.6 | 2.81*a* | 5.9 | 2.71*a* | 3.3 |
| 29 | 5.38 | 111 | 2.90*a* | 8.6 | 2.82 | 6.2 | 2.70 | 3.0 |
| 30 | 5.38*a* | 111 | 2.91 | 8.9 | 2.82*a* | 6.2 | 2.69*a* | 2.8 |
| 31 | 5.37 | 111 | 2.88*a* | 8.0 | ..... | ..... | 2.68 | 2.5 |

*a* Gauge height interpolated.

MONTHLY DISCHARGE of Pigeon Creek near Westerose, for 1915.

(Drainage area 122 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (24-31) | 14.8 | 12.0 | 13.3 | 0.109 | 0.03 | 211 |
| April | 22.0 | 15.0 | 18.0 | 0.148 | 0.16 | 1,071 |
| May | 27.0 | 13.7 | 19.5 | 0.160 | 0.18 | 1,199 |
| June | 51.0 | 17.5 | 29.0 | 0.238 | 0.27 | 1,726 |
| July | 115.0 | 49.0 | 95.0 | 0.779 | 0.90 | 5,841 |
| August | 110.0 | 8.0 | 49.0 | 0.402 | 0.46 | 3,013 |
| September | 10.9 | 4.8 | 6.6 | 0.054 | 0.06 | 393 |
| October | 5.9 | 1.8 | 3.5 | 0.029 | 0.03 | 215 |
| The period | ..... | ..... | ..... | ..... | 2.09 | 13,669 |

BATTLE RIVER AT PONOKA.

*Location.*—On the SW. ¼ Sec. 4, Tp. 43, Rge. 25, W. 4th Mer., at the steel traffic bridge, 300 yards southeast of the C.P.R. depot in the town of Ponoka.

*Records available.*—May 7, 1913, to December 31, 1915.

*Gauge.*—Vertical staff. Zero elevation maintained at 88.31 since establishment.

*Bench-mark.*—Permanent iron bench-mark located beside outside pile on upstream side of left abutment. Assumed elevation, 100.00 feet.

*Channel.*—One, slightly shifting.

*Discharge measurements.*—Made from bridge, and in low stages by wading at a point 300 feet upstream.

*Winter flow.*—Stream affected by ice from November to April, and measurements are made at a point 300 feet upstream from bridge.

*Observer.*—G. R. Edwards.

DISCHARGE MEASUREMENTS of Battle River at Ponoka, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq.-ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 4 | P. H. Daniells | 21 | 26 | 1.29 | 3.01 | 34.0 |
| Jan. 25 | R. J. McGuinness | 57 | 72 | 0.34 | 3.11 | 25.0 |
| Feb. 26 | do | 52 | 35 | 0.39 | 3.11 | 13.7 |
| Mar. 22 | J. M. Paul | 67 | 145 | 0.32 | 7.61 | 47.0 |
| April 19 | I. R. Strome | 74 | 68 | 1.55 | 3.15 | 106.0 |
| May 6 | do | 68 | 266 | 0.37 | 3.15 | 97.0 |
| May 26 | do | 72 | 307 | 0.53 | 3.68 | 162.0 |
| May 27 | do | 78 | 107 | 2.29 | 4.27 | 245.0 |
| June 14 | do | 86 | 708 | 1.48 | 8.57 | 1,051.0 |
| July 13 | do | 86 | 622 | 1.44 | 7.81 | 897.0 |
| July 29 | do | 83 | 506 | 1.33 | 6.84 | 676.0 |
| Aug. 31 | do | 63 | 190 | 0.31 | 2.82 | 60.0 |
| Sept. 20 | do | 64 | 198 | 0.47 | 2.93 | 91.0 |
| Oct. 5 | do | 68 | 225 | 0.58 | 3.36 | 130.0 |
| Oct. 22 | do | 64 | 192 | 0.35 | 2.85 | 68.0 |
| Nov. 9 | J. M. Paul | 64 | 49 | 1.16 | 2.58 | 57.0 |
| Dec. 1 | do | 30 | 23 | 1.00 | 2.60 | 23.0 |

DAILY GAUGE HEIGHT AND DISCHARGE of Battle River at Ponoka, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.98 | 32*a* | 3.00 | 20 | 3.06 | 14 | 5.12 | 128 | 3.15 | 100 | 4.25 | 237 |
| 2 | 2.98 | 33 | 3.00 | 19 | 3.01 | 15 | 4.87 | 137 | 3.15 | 100 | 5.35 | 409 |
| 3 | 2.98 | 34 | 3.00 | 20 | 3.06 | 15 | 4.86 | 146 | 3.15 | 100 | 8.10 | 949 |
| 4 | 3.00 | 34 | 2.85 | 20 | 3.06 | 16 | 4.91 | 154 | 3.15 | 100 | 8.70 | 1,078 |
| 5 | 2.95 | 33 | 2.80 | 20 | 3.06 | 17 | 4.90 | 164 | 3.15 | 100 | 11.78 | 1,797 |
| 6 | 2.95 | 32 | 2.80 | 20 | 3.08 | 18 | 4.70 | 174 | 3.15 | 100 | 12.49 | 1,968 |
| 7 | 3.00 | 32 | 2.85 | 19 | 3.08 | 19 | 4.49 | 184*a* | 3.05 | 90 | 11.68 | 1,773 |
| 8 | 2.97 | 32 | 2.85 | 19 | 3.08 | 20 | 3.94 | 194 | 3.05 | 90 | 10.60 | 1,514 |
| 9 | 3.00 | 33 | 2.85 | 18 | 3.09 | 21 | 3.98 | 199 | 3.00 | 86 | 8.80 | 1,100 |
| 10 | 2.98 | 33 | 2.85 | 18 | 3.09 | 22 | 3.78 | 172 | 3.00 | 86 | 7.60 | 844 |
| 11 | 3.01 | 33 | 2.85 | 18 | 3.10 | 23 | 3.72 | 165 | 3.00 | 86 | 7.95 | 917 |
| 12 | 3.00 | 31 | 2.90 | 18 | 3.10 | 23 | 3.46 | 134 | 3.05 | 90 | 8.25 | 980 |
| 13 | 3.00 | 29 | 2.90 | 17 | 3.10 | 22 | 3.50 | 138 | 3.05 | 90 | 8.55 | 1,045 |
| 14 | 3.00 | 27 | 2.90 | 18 | 3.11 | 22 | 3.49 | 137 | 3.05 | 90 | 8.55 | 1,045 |
| 15 | 3.01 | 25 | 2.85 | 18 | 3.22 | 24 | 3.43 | 130 | 3.20 | 105 | 7.95 | 917 |
| 16 | 3.01 | 24 | 2.90 | 18 | 3.23 | 27 | 3.42 | 129 | 3.25 | 111 | 7.05 | 730 |
| 17 | 3.01 | 25 | 2.95 | 17 | 3.43 | 31 | 3.36 | 123 | 3.40 | 127 | 6.60 | 640 |
| 18 | 3.01 | 26 | 2.90 | 16 | 3.48 | 35 | 3.30 | 116 | 3.45 | 133 | 6.80 | 680 |
| 19 | 3.03 | 27 | 2.90 | 15 | 4.79 | 39 | 3.15 | 100 | 3.35 | 122 | 7.00 | 720 |
| 20 | 3.05 | 27 | 2.90 | 15 | 5.05 | 38 | 3.15 | 100 | 3.30 | 116 | 6.85 | 680 |
| 21 | 3.05 | 26 | 2.92 | 15 | 5.76 | 42 | 3.15 | 100 | 3.20 | 105 | 6.45 | 610 |
| 22 | 3.05 | 26 | 2.87 | 14 | 7.52 | 47 | 3.15 | 100 | 3.15 | 100 | 6.10 | 544 |
| 23 | 3.05 | 25 | 2.87 | 14 | 8.42 | 55 | 3.25 | 111 | 3.20 | 105 | 5.85 | 499 |
| 24 | 3.08 | 25 | 2.87 | 14 | 8.76 | 63 | 3.30 | 116 | 3.15 | 100 | 5.75 | 481 |
| 25 | 3.10 | 25 | 2.82 | 14 | 8.70 | 71 | 3.35 | 122 | 3.15 | 100 | 5.55 | 445 |
| 26 | 3.10 | 24 | 3.09 | 14 | 7.40 | 79 | 3.35 | 122 | 3.75 | 168 | 5.85 | [illegible] |
| 27 | 3.10 | 24 | 3.04 | 14 | 7.10 | 87 | 3.30 | 116 | 4.25 | 237 | 7.85 | 896 |
| 28 | 3.10 | 23 | 3.04 | 14 | 5.74 | 95 | 3.20 | 105 | 4.35 | 251 | 8.75 | 1,089 |
| 29 | 3.10 | 22 | ..... | .. | 5.74 | 103 | 3.25 | 111 | 4.20 | 230 | 10.35 | 1,449 |
| 30 | 3.00 | 21 | ..... | | 5.38 | 111 | 3.20 | 105 | 4.65 | 296 | 11.34 | [illegible] |
| 31 | 3.00 | 20 | ..... | | 5.38 | 119 | | | 4.50 | 273 | | |

*a* to *a* Ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Battle River at Ponoka, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 11.05 | 1,622 | 5.70 | 472 | 2.78 | 67 | 2.85 | 72 | 2.70 | 61 | 2.60 | 23 |
| 2 | 10.33 | 1,449 | 5.60 | 454 | 2.78 | 67 | 2.95 | 81 | 2.65 | 58 | 2.60 | 23 |
| 3 | 9.40 | 1,234 | 5.10 | 366 | 2.75 | 65 | 3.15 | 100 | 2.27 | 37 | 2.65 | 22 |
| 4 | 7.50 | 823 | 4.85 | 326 | 2.73 | 63 | 3.30 | 116 | 2.70 | 61 | 3.00 | 22 |
| 5 | 6.40 | 600 | 4.65 | 296 | 2.70 | 61 | 3.40 | 127 | 2.90 | 77 | 2.65 | 21 |
| 6 | 5.95 | 517 | 4.45 | 266 | 2.75 | 65 | 3.27 | 113 | 2.38 | 42 | 2.63 | 20 |
| 7 | 6.10 | 544 | 4.35 | 251 | 2.78 | 67 | 3.20 | 105 | 2.70 | 46*b* | 2.65 | 20 |
| 8 | 6.50 | 620 | 4.30 | 244 | 2.80 | 68 | 3.10 | 95 | 2.65 | 51 | 2.65 | 19 |
| 9 | 6.65 | 650 | 4.25 | 237 | 2.80 | 68 | 3.05 | 90 | 2.60 | 57 | 2.65 | 18 |
| 10 | 6.85 | 690 | 4.10 | 216 | 2.75 | 65 | 3.03 | 89 | 2.52 | 55 | 2.65 | 18 |
| 11 | 7.30 | 781 | 4.00 | 202 | 2.75 | 65 | 3.00 | 86 | 2.52 | 54 | 2.68 | 17 |
| 12 | 7.70 | 865 | 3.85 | 181 | 2.75 | 65 | 2.98 | 84 | 2.55 | 52 | 2.70 | 16 |
| 13 | 7.80 | 886 | 3.80 | 175 | 2.75 | 65 | 2.95 | 81 | 2.55 | 50 | 2.73 | 16 |
| 14 | 7.70 | 865 | 3.65 | 156 | 2.75 | 65 | 2.95 | 81 | 2.55 | 49 | 2.75 | 16 |
| 15 | 8.10 | 949 | 3.45 | 133 | 2.75 | 65 | 2.95 | 81 | 2.55 | 47 | 2.75 | 16 |
| 16 | 8.90 | 1,122 | 3.40 | 127 | 2.78 | 67 | 2.95 | 81 | 2.55 | 45 | 2.70 | 17 |
| 17 | 9.70 | 1,303 | 3.35 | 122 | 2.98 | 84 | 2.90 | 77 | 2.55 | 44 | 2.80 | 17 |
| 18 | 11.26 | 1,672 | 3.30 | 116 | 2.98 | 84 | 2.85 | 72 | 2.55 | 42 | 2.75 | 17 |
| 19 | 12.04 | 1,860 | 3.30 | 116 | 2.95 | 81 | 2.80 | 68 | 2.55 | 40 | 2.75 | 17 |
| 20 | 11.93 | 1,833 | 3.40 | 127 | 2.93 | 80 | 2.80 | 68 | 2.55 | 39 | 2.78 | 18 |
| 21 | 11.25 | 1,670 | 3.30 | 116 | 2.93 | 80 | 2.85 | 72 | 2.55 | 38 | 2.78 | 18 |
| 22 | 10.48 | 1,485 | 3.25 | 111 | 2.93 | 80 | 2.85 | 72 | 2.55 | 36 | 3.25 | 17 |
| 23 | 9.80 | 1,326 | 3.10 | 95 | 2.85 | 72 | 2.83 | 71 | 2.55 | 35 | 3.35 | 16 |
| 24 | 10.33 | 1,449 | 3.05 | 90 | 2.87 | 74 | 2.80 | 71 | 2.55 | 33 | 2.85 | 16 |
| 25 | 10.93 | 1,593 | 2.95 | 81 | 2.85 | 72 | 2.80 | 71 | 2.55 | 30 | 2.79 | 15 |
| 26 | 9.70 | 1,303 | 2.95 | 81 | 2.85 | 72 | 2.80 | 71 | 2.55 | 29 | 2.82 | 15 |
| 27 | 8.60 | 1,056 | 2.95 | 81 | 2.90 | 77 | 2.80 | 71 | 2.55 | 27 | 2.82 | 14 |
| 28 | 7.50 | 823 | 2.85 | 72 | 2.95 | 81 | 2.80 | 71 | 2.55 | 26 | 2.84 | 14 |
| 29 | 6.85 | 690 | 2.85 | 72 | 2.90 | 77 | 2.80 | 71 | 2.55 | 24 | 2.86 | 13 |
| 30 | 6.55 | 630 | 2.85 | 72 | 2.85 | 72 | 2.78 | 67 | 2.00 | 24 | 2.83 | 13 |
| 31 | 6.05 | 535 | 2.80 | 68 | ..... | ..... | 2.75 | 65 | ..... | ..... | 2.84 | 12*b* |

*b* to *b* Ice conditions.

MONTHLY DISCHARGE of Battle River at Ponoka, for 1915.

(Drainage area 670 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 34 | 20 | 28 | 0.042 | 0.05 | 1,722 |
| February | 20 | 14 | 17 | 0.025 | 0.03 | 944 |
| March | 119 | 14 | 43 | 0.064 | 0.07 | 2,644 |
| April | 199 | 100 | 134 | 0.200 | 0.22 | 7,974 |
| May | 296 | 86 | 129 | 0.192 | 0.22 | 7,932 |
| June | 1,968 | 237 | 941 | 1.404 | 1.57 | 55,993 |
| July | 1,860 | 517 | 1,079 | 1.610 | 1.86 | 66,346 |
| August | 472 | 68 | 178 | 0.266 | 0.31 | 10,945 |
| September | 84 | 61 | 71 | 0.106 | 0.12 | 4,225 |
| October | 127 | 65 | 82 | 0.122 | 0.14 | 5,042 |
| November | 77 | 24 | 44 | 0.066 | 0.07 | 2,618 |
| December | 23 | 12 | 17 | 0.025 | 0.03 | 1,045 |
| The year | ..... | ..... | ..... | ..... | 4.69 | 167,430 |

BATTLE RIVER AT BATTLEFORD.

*Location.*—Lower station on the SE. ¼ Sec. 19, Tp. 43, Rge. 16, W. 3rd Mer., at the traffic bridge about one and one-quarter miles south of Canadian Northern Railway station at Battleford. Upper station on the NW. ¼ Sec. 25, Tp. 43, Rge. 17, W. 3rd Mer., at the traffic bridge about one mile west of the Canadian Northern Railway station at Battleford.

*Records available.*—June 17, 1911, to December 31, 1915. Lower station abandoned June 20, 1915. Observations for 1915 at upper station start April 1.

*Gauge.*—Upper station, chain gauge 200 feet from initial point of soundings. Zero elevation maintained at 83.89 feet since establishment (May 23, 1914).

*Bench-mark.*—On top of abutment, downstream side of west end of bridge. Assumed elevation, 100.00 feet.

*Channel.*—Permanent.

*Discharge measurements.*—From bridge.

*Winter flow.*—Lower station used winter of 1914–15. Upper station used winter of 1915–16.

*Observers.*—At lower station, C. J. Johnston; at upper station, H. J. Ghent, April 1 to August 28; R. L. Robson, September 15, to December 31.

*Remarks.*—Several gaps in gauge height observations.

DISCHARGE MEASUREMENTS of Battle River at Battleford, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean. Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 7 | F. R. Steinberger *a* | 95.5 | 129 | 0.80 | 4.58 | 116 |
| Jan. 23 | do *a* | 87.0 | 107 | 0.85 | 4.65 | 91 |
| Feb. 17 | E. W. W. Hughes *a* | 52.0 | 79 | 0.90 | 4.66 | 72 |
| Mar. 1 | do *a* | 49.0 | 83 | 0.77 | 4.75 | 64 |
| Mar. 19 | do *a* | 59.0 | 88 | 0.78 | 4.80 | 69 |
| April 7 | do *b* | 207.0 | 945 | 2.12 | 7.18 | 2,005 |
| May 6 | do *a* | 140.0 | 266 | 2.02 | 4.50 | 537 |
| May 6 | do *b* | ..... | ..... | ..... | 3.93 | 537 |
| July 23 | F. K. Beach *b* | 209.5 | 1,027 | 2.67 | 7.64 | 2,740 |
| Aug. 18 | do *b* | 201.0 | 635 | 2.52 | 5.95 | 1,599 |
| Sept. 15 | do *b* | 174.3 | 281 | 2.07 | 4.00 | 581 |
| Oct. 12 | do *b* | 129.0 | 237 | 1.88 | 3.68 | 446 |
| Nov. 8 | F. R. Steinberger *b* | 199.0 | 426 | 0.32 | 4.40 | 139 |
| Nov. 25 | do *b* | 134.0 | 193 | 1.06 | 3.89 | 206 |
| Dec. 15 | do *b* | 126.0 | 108 | 1.00 | 3.44 | 109 |
| Dec. 29 | do *b* | 124.0 | 81 | 0.95 | 3.40 | 77 |

*a* Lower station.
*b* Upper station.

DAILY GAUGE HEIGHT AND DISCHARGE of Battle River at Battleford, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 4.60*a* | 130 | 4.67 | 90 | 4.75 | 64 | 5.60 | 290 | 4.15 | 635 | 3.83 | 510 |
| 2 | 4.60 | 135 | 4.66 | 89 | 4.74 | 64 | 6.91 | 400 | 4.15 | 635 | 3.81 | 505 |
| 3 | 4.58 | 128 | 4.66 | 86 | 4.74 | 65 | 7.30 | 440 | 4.02 | 580 | 3.80 | 500 |
| 4 | 4.55 | 124 | 4.65 | 84 | 4.80 | 70 | 9.17 | 1,000 | 3.95 | 555 | 3.94 | 550 |
| 5 | 4.54 | 120 | 4.63 | 81 | 4.83 | 76 | 11.69 | 2,000 | 3.90 | 535 | 3.98 | 565 |
| 6 | 4.52 | 118 | 4.62 | 79 | 4.87 | 85 | 12.32 | 2,000 | 3.93 | 545 | 4.15 | 635 |
| 7 | 4.58 | 116 | 4.62 | 76 | 4.89 | 85 | 10.04 | 2,005 | 3.85 | 520 | 4.08 | 605 |
| 8 | 4.60 | 113 | 4.62 | 74 | 4.88 | 85 | 6.65*a* | 2,050 | 3.79 | 500 | 4.11 | 615 |
| 9 | 4.65 | 112 | 4.62 | 72 | 4.89 | 85 | 7.07 | 2,350 | 3.75 | 485 | 4.10 | 610 |
| 10 | 4.69 | 110 | 4.63 | 72 | 4.87 | 82 | 7.08 | 2,355 | 3.72 | 475 | 4.12 | 620 |
| 11 | 4.70 | 109 | 4.62 | 72 | 4.89 | 84 | 7.01 | 2,305 | 3.70 | 470 | 4.28 | 690 |
| 12 | 4.70 | 107 | 4.61 | 66 | 4.90 | 85 | 6.86 | 2,205 | 3.70 | 470 | 4.32 | 705 |
| 13 | 4.68 | 105 | 4.59 | 64 | 4.80 | 70 | 6.50 | 1,960 | 3.71 | 470 | 4.38 | 730 |
| 14 | 4.68 | 104 | 4.60 | 64 | 4.80 | 70 | 6.34 | 1,855 | 3.84 | 515 | 4.49 | 775 |
| 15 | 4.68 | 102 | 4.63 | 64 | 4.81 | 70 | 6.16 | 1,735 | 3.77 | 490 | 4.56 | 810 |
| 16 | 4.68 | 100 | 4.63 | 67 | 4.80 | 70 | 6.00 | 1,630 | 3.73 | 480 | 4.60 | 830 |
| 17 | 4.67 | 99 | 4.66 | 72 | 4.79 | 70 | 5.87 | 1,545 | 3.70 | 470 | 4.75 | 900 |
| 18 | 4.66 | 97 | 4.66 | 75 | 4.78 | 70 | 5.47 | 1,295 | 3.62 | 440 | 4.84 | 945 |
| 19 | 4.66 | 95 | 4.67 | 76 | 4.80 | 69 | 5.30 | 1,195 | 3.64 | 450 | 5.02 | 1,030 |
| 20 | 4.66 | 94 | 4.66 | 73 | 4.80 | 66 | 5.10 | 1,080 | 3.60 | 435 | 5.30 | 1,195 |
| 21 | 4.66 | 93 | 4.68 | 64 | 4.73 | 60 | 5.00 | 1,020 | 3.65 | 450 | 5.40 | 1,250 |
| 22 | 4.65 | 92 | 4.69 | 65 | 4.82 | 75 | 4.90 | 970 | 3.80 | 500 | 5.48 | 1,300 |
| 23 | 4.65 | 91 | 4.70 | 66 | 4.88 | 110 | 4.59 | 825 | 3.70 | 470 | 5.50 | 1,310 |
| 24 | 4.68 | 92 | 4.70 | 65 | 5.80 | 265 | 4.70 | 875 | 3.72 | 475 | 5.55 | 1,340 |
| 25 | ..... | 93 | 4.72 | 65 | 6.60 | 445 | 4.55 | 805 | 3.69 | 465 | 5.60 | 1,375 |
| 26 | ..... | 93 | 4.72 | 64 | 6.41 | 425 | 4.50 | 780 | 3.68 | 460 | 5.68 | 1,425 |
| 27 | ..... | 92 | 4.72 | 64 | 6.16 | 405 | 4.48 | 770 | 3.67 | 460 | 5.70 | 1,440 |
| 28 | ..... | 90 | 4.74 | 64 | 6.15 | 380 | 4.40 | 740 | 3.70 | 470 | 5.80 | 1,500 |
| 29 | 4.65 | 89 | ..... | ..... | 6.01 | 360 | 4.39 | 735 | 3.74 | 480 | 5.93 | 1,585 |
| 30 | 4.67 | 90 | ..... | ..... | 5.84 | 335 | 4.25 | 675 | 3.90 | 535 | 7.57*b* | 1,550 |
| 31 | 4.68 | 91 | ..... | ..... | 5.80 | 315 | ..... | ..... | 3.85 | 520 | ..... | ..... |

*a–a* Ice conditions. Observations at lower station.
*b* Backwater from North Saskatchewan River.

DAILY GAUGE HEIGHT AND DISCHARGE of Battle River at Battleford, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 7.48*b* | 1,510 | 6.99 | 2,295 | ..... | 1,180 | 3.86 | 520 | 3.60 | 435 | 3.65 | 150 |
| 2 | 5.75 | 1,470 | 6.94 | 2,260 | ..... | 1,135 | 3.86 | 520 | 3.62 | 440 | 3.63 | 143 |
| 3 | 5.72 | 1,450 | 6.90 | 2,230 | ..... | 1,095 | 3.81 | 505 | 3.65 | 450 | 3.60 | 135 |
| 4 | 5.60 | 1,375 | 6.91 | 2,240 | ..... | 1,050 | 3.79 | 500 | 3.65 | 450 | 3.56 | 125 |
| 5 | 5.58 | 1,360 | 6.94 | 2,260 | ..... | 1,005 | 3.78 | 495 | 3.60*a* | 435 | 3.52 | 117 |
| 6 | 5.64 | 1,400 | 6.95 | 2,265 | ..... | 965 | 3.81 | 505 | 3.55 | 330 | 3.53 | 118 |
| 7 | 5.69 | 1,430 | 6.94 | 2,260 | ..... | 920 | 3.77 | 490 | ..... | 235 | 3.50 | 113 |
| 8 | 5.72 | 1,450 | ..... | 2,205 | ..... | 875 | 3.75 | 485 | 4.40 | 139 | 3.43 | 103 |
| 9 | 5.80 | 1,500 | ..... | 2,150 | ..... | 845 | 3.71 | 470 | ..... | 142 | 3.46 | 103 |
| 10 | 5.93 | 1,585 | ..... | 2,095 | ..... | 790 | 3.69 | 465 | ..... | 146 | 3.48 | 105 |
| 11 | 6.02 | 1,645 | ..... | 2,040 | ..... | 745 | 3.67 | 460 | ..... | 150 | 3.48 | 106 |
| 12 | 6.10 | 1,695 | ..... | 1,985 | ..... | 705 | 3.67 | 460 | ..... | 154 | 3.51 | 107 |
| 13 | 6.18 | 1,750 | ..... | 1,930 | ..... | 660 | 3.69 | 465 | ..... | 158 | 3.50 | 108 |
| 14 | 6.22 | 1,775 | ..... | 1,875 | ..... | 610 | 3.66 | 455 | ..... | 162 | 3.48 | 108 |
| 15 | 6.28 | 1,815 | 6.29 | 1,820 | 4.00 | 570 | 3.64 | 450 | ..... | 166 | 3.48 | 109 |
| 16 | 6.30 | 1,830 | 6.24 | 1,790 | 4.00 | 570 | 3.61 | 435 | ..... | 170 | 3.48 | 106 |
| 17 | 6.38 | 1,880 | 6.07 | 1,675 | 4.01 | 575 | 3.67 | 460 | ..... | 174 | 3.48 | 105 |
| 18 | 6.40 | 1,895 | 5.96 | 1,605 | 3.97 | 560 | 3.65 | 450 | ..... | 178 | 3.46 | 102 |
| 19 | 6.43 | 1,915 | 5.90 | 1,565 | 3.96 | 555 | 3.63 | 445 | ..... | 182 | 3.46 | 100 |
| 20 | 6.50 | 1,960 | 5.86 | 1,540 | 3.94 | 550 | 3.61 | 435 | ..... | 186 | 3.46 | 97 |
| 21 | 7.00 | 2,300 | 5.82 | 1,515 | 3.90 | 535 | 3.62 | 440 | ..... | 190 | 3.46 | 95 |
| 22 | 7.70 | 2,785 | 5.80 | 1,500 | 3.89 | 535 | 3.63 | 445 | ..... | 190 | 3.46 | 93 |
| 23 | 7.65 | 2,750 | 5.78 | 1,490 | 3.87 | 525 | 3.57 | 425 | ..... | 198 | 3.44 | 90 |
| 24 | 7.62 | 2,725 | 5.74 | 1,465 | 3.89 | 535 | 3.57 | 425 | ..... | 202 | 3.42 | 88 |
| 25 | 7.58 | 2,700 | 5.70 | 1,440 | 3.84 | 515 | 3.59 | 430 | 3.89 | 206 | 3.41 | 85 |
| 26 | 7.56 | 2,685 | 5.64 | 1,400 | 3.85 | 520 | 3.58 | 425 | ..... | 198 | 3.41 | 82 |
| 27 | 7.40 | 2,570 | 5.61 | 1,380 | 3.84 | 515 | 3.59 | 430 | ..... | 187 | 3.40 | 80 |
| 28 | 7.28 | 2,490 | 5.57 | 1,355 | 3.85 | 520 | 3.60 | 435 | ..... | 176 | 3.39 | 78 |
| 29 | 7.20 | 2,435 | ..... | 1,310 | 3.85 | 520 | 3.61 | 435 | 3.70 | 167 | 3.38 | 77 |
| 30 | 7.13 | 2,390 | ..... | 1,265 | 3.86 | 520 | 3.62 | 440 | 3.70 | 165 | 3.37 | 73 |
| 31 | 7.00 | 2,300 | ..... | 1,225 | ..... | ..... | 3.61 | 435 | ..... | ..... | 3.36*a* | 71 |

*a–a* Ice conditions. Where no gauge heights are shown, discharge is estimated.
*b* Backwater from North Saskatchewan River.

MONTHLY DISCHARGE of Battle River at Battleford, for 1915.

(Drainage area 11,850 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 135 | 89 | 104 | 0.0088 | 0.01 | 6,395 |
| February | 90 | 64 | 72 | 0.0061 | 0.01 | 3,999 |
| March | 445 | 64 | 150 | 0.0127 | 0.01 | 9,223 |
| April | 2,355 | 290 | 1,330 | 0.1123 | 0.13 | 79,140 |
| May | 635 | 435 | 498 | 0.0420 | 0.05 | 30,621 |
| June | 1,585 | 500 | 947 | 0.0799 | 0.09 | 56,350 |
| July | 2,785 | 1,360 | 1,962 | 0.1656 | 0.19 | 120,639 |
| August | 2,295 | 1,225 | 1,788 | 0.1509 | 0.17 | 109,940 |
| September | 1,180 | 515 | 707 | 0.0597 | 0.07 | 42,069 |
| October | 520 | 425 | 459 | 0.0387 | 0.04 | 28,223 |
| November | 450 | 139 | 225 | 0.0190 | 0.02 | 13,388 |
| December | 150 | 71 | 102 | 0.0086 | 0.01 | 6,272 |
| The year | | | | | 0.80 | 506,209 |

NORTH SASKATCHEWAN RIVER AT PRINCE ALBERT.

*Location.*—On river lot 76, Prince Albert settlement, at the Canadian Northern Railway and traffic bridge.

*Records available.*—October 2, 1911, to December 31, 1915.

*Gauge.*—Chain. Zero elevation has been maintained at 1,370.397 since establishment.

*Bench-mark.*—Brass bolt on top of right abutment of bridge, downstream side, marked "P.W.D. B.M.47." Elevation of bench-mark, 1,403.502 feet above mean sea level, determined by Canadian Geodetic Surveys.

*Channel.*—Partly boulders, partly sand. Not liable to very great changes.

*Discharge measurements.*—From bridge at gauge.

*Open water.*—April 10 to Nov. 7, 1915.

*Maximum flow.*—During flood of June–July, 1915, a maximum gauge height of 26.42 feet was reached, and a maximum discharge of 200,000 second-feet. This is a slightly greater height than was reached in August, 1899. Estimates of maximum discharge are supported by evidence from various sources, each sustaining the estimate to a probable accuracy within 5 per cent.

*Minimum flow.*—January 19, 1914, a flow of 850 sec.-feet was recorded.

*Observer.*—W. Moodie.

DISCHARGE MEASUREMENTS of North Saskatchewan River at Prince Albert, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 2, 4, 5 | F. R. Steinberger | 544 | 1,447 | 1.01 | 3.92 | 1,460 |
| Feb. 7 | E. W. W. Hughes | 530 | 1,486 | 1.21 | 4.19 | 1,796 |
| Feb. 10 | do | 530 | 1,390 | 1.23 | 4.19 | 1,712 |
| Feb. 26 | do | 517 | 1,438 | 1.12 | 4.26 | 1,614 |
| Mar. 12 | do | 512 | 1,439 | 1.09 | 4.29 | 1,570 |
| Mar. 15 | do | 527 | 1,461 | 1.09 | 4.26 | 1,588 |
| April 2 | do | 544 | 1,917 | 1.28 | 4.73 | 2,462 |
| April 30 and May 1 | do | 759 | 3,348 | 1.56 | 4.67 | 5,224 |
| June 8 | F. K. Beach | 846 | 6,303 | 3.04 | 8.36 | 19,169 |
| July 1 | G. H. Whyte *a* | 908 | 19,500 | 8.37 | 22.45 | 163,303 |
| July 2 | do *b* | 935 | 23,792 | 7.81 | 26.35 | 185,794 |
| July 3 | do *c* | 906 | 18,100 | 5.95 | 20.95 | 107,742 |
| July 5 | F. K. Beach *d* | 886 | 12,312 | 4.78 | 14.49 | 58,834 |
| Aug. 16 | do | 857 | 7,664 | 3.29 | 9.68 | 25,141 |
| Sept. 13 | do | 828 | 5,864 | 2.65 | 7.63 | 15,538 |
| Oct. 9 | do | 757 | 4,278 | 1.86 | 5.65 | 7,969 |
| Nov. 4, 5 | F. R. Steinberger | 745 | 3,574 | 1.64 | 4.84 | 5,871 |
| Nov. 20, 22, 23 | do | 685 | 4,151 | 0.63 | 5.41 | 2,618 |
| Dec. 9, 10 | do | 665 | 3,336 | 0.72 | 4.96 | 2,402 |

*a, b, c, d.* Velocities observed at depth of 1 foot, affected by coefficient to obtain mean velocity, and applied to soundings obtained after flood subsided.

*a, c* Coefficient to obtain mean velocity—0.92.

*b* Coefficient to obtain mean velocity—1.20. High on account of debris on piers.

*d* Coefficient to obtain mean velocity—0.94.

DAILY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River at Prince Albert, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.72*b* | 1,280 | 4.15 | 1,600 | 4.30 | 1,630 | 4.57 | 2,250 | 4.72 | 5,480 | 6.22 | 9,940 |
| 2 | 3.82 | 1,340 | 4.10 | 1,650 | 4.31 | 1,660 | 4.73 | 2,500 | 4.63 | 5,260 | 6.46 | 10,810 |
| 3 | 3.90 | 1,400 | 4.10 | 1,690 | 4.32 | 1,660 | 4.99 | 3,200 | 4.69 | 5,410 | 6 64 | 11,510 |
| 4 | 3.92 | 1,440 | 4.10 | 1,710 | 4.32 | 1,670 | 5.20 | 3,900 | 4.74 | 5,530 | 6.98 | 12,870 |
| 5 | 3.99 | 1,450 | 4.15 | 1,750 | 4.30 | 1,610 | 5.97 | 6,030 | 4.67 | 5,360 | 7.15 | 13,580 |
| 6 | 4.08 | 1,540 | 4.19 | 1,780 | 4.25 | 1,580 | 6.85 | 9,220 | 4.65 | 5,310 | 7.02 | 13,030 |
| 7 | 4.10 | 1,700 | 4.18 | 1,800 | 4.27 | 1,570 | 7.01 | 10,500 | 4.60 | 5,190 | 7.16 | 13,620 |
| 8 | 4.10 | 1,800 | 4.21 | 1,770 | 4.27 | 1,570 | 8.05 | 15,500 | 4.60 | 5,190 | 8.2*e* | 18,470 |
| 9 | 4.20 | 1,900 | 4.21 | 1,750 | 4.27 | 1,580 | 8.62 | 18,500 | 4.58 | 5,140 | 9.65 | 25,110 |
| 10 | 4.30 | 2,000 | 4.19 | 1,710 | 4.28 | 1,580 | 8.21*b* | 18,240 | 4.49 | 4,930 | 11.10 | 33,860 |
| 11 | 4.30 | 2,100 | 4.19 | 1,700 | 4.30 | 1,580 | 6.93 | 12,670 | 4.48 | 4,910 | 10.86 | 32,300 |
| 12 | 4.35 | 2,150 | 4.19 | 1,700 | 4.29 | 1,570 | 7.18 | 13,710 | 4.44 | 4,820 | 9.97 | 26,840 |
| 13 | 4.31 | 2,100 | 4.19 | 1,690 | 4.29 | 1,580 | 7.60 | 15,500 | 4.48 | 4,910 | 9.52 | 23,410 |
| 14 | 4.25 | 2,050 | 4.19 | 1,660 | 4.25 | 1,580 | 7.42 | 14,710 | 4.58 | 5,140 | 9.16 | 22,630 |
| 15 | 4.35 | 2,050 | 4.19 | 1,650 | 4.26 | 1,590 | 6.80 | 12,150 | 4.70 | 5,430 | 10.23 | 28,380 |
| 16 | 4.25 | 2,050 | 4.18 | 1,630 | 4.26 | 1,590 | 6.68 | 11,670 | 5.01 | 5,180 | 12.38 | 42,660 |
| 17 | 4.25 | 2,030 | 4.15 | 1,570 | 4.26 | 1,600 | 6.44 | 10,730 | 5.26 | 6,880 | 11.74 | 38,180 |
| 18 | 4.30 | 2,000 | 4.15 | 1,560 | 4.26 | 1,600 | 6.16 | 9,730 | 5.36 | 7,160 | 11.14 | 34,120 |
| 19 | 4.22 | 1,970 | 4.18 | 1,570 | 4.25 | 1,630 | 5.90 | 8,830 | 5.60 | 7,870 | 10.63 | 30,830 |
| 20 | 4.25 | 1,950 | 4.18 | 1,560 | 4.32 | 1,700 | 5.74 | 8,320 | 5.79 | 8,480 | 10.38 | 29,280 |
| 21 | 4.20 | 1,880 | 4.18 | 1,550 | 4.35 | 1,780 | 5.55 | 7,710 | 5.92 | 8,890 | 10.14 | 27,840 |
| 22 | 4.15 | 1,800 | 4.23 | 1,600 | 4.35 | 1,790 | 5.34 | 7,100 | 5.90 | 8,830 | 9.98 | 26,890 |
| 23 | 4.20 | 1,750 | 4.26 | 1,610 | 4.35 | 1,800 | 5.24 | 6,820 | 5.73 | 8,290 | 9.79 | 25,870 |
| 24 | 4.21 | 1,700 | 4.26 | 1,610 | 4.30 | 1,750 | 5.15 | 6,570 | 5.81 | 8,540 | 10.17 | 28,020 |
| 25 | 4.10 | 1,690 | 4.26 | 1,610 | 4.35 | 1,770 | 5.06 | 6,320 | 6.14 | 9,650 | 10.90 | 32,560 |
| 26 | 4.10 | 1,640 | 4.26 | 1,610 | 4.42 | 1,850 | 4.97 | 6,080 | 6.43 | 10,700 | 10.66 | 31,020 |
| 27 | 4.10 | 1,600 | 4.30 | 1,620 | 4.48 | 1,950 | 4.94 | 6,010 | 6.39 | 10,550 | 10.19 | 28,140 |
| 28 | 4.10 | 1,550 | 4.30 | 1,620 | 4.51 | 2,050 | 4.78 | 5,620 | 6.24 | 10,010 | 9.84 | 26,140 |
| 29 | 4.05 | 1,520 | ..... | ..... | 4.45 | 2,000 | 4.78 | 5,620 | 6.15 | 9,690 | 9.68 | 25,270 |
| 30 | 4.14 | 1,550 | ..... | ..... | 4.45 | 2,000 | 4.80 | 5,670 | 6.02 | 9,220 | 9.84*a* | 27,508 |
| 31 | 4.25 | 1,590 | ..... | ..... | 4.45 | 2,050 | ..... | ..... | 6.00 | 9,150 | ..... | ..... |

*a* Mean gauge height and discharge from hourly records.
*b* to *b* Open water.

DAILY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River at Prince Albert, for 1915.

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 20.40*a* | 139,945 | 11.49 | 36,430 | 9.53 | 24,460 | 6.01 | 9,190 | 4.94 | 6,010 | 5.25 | 2,720 |
| 2 | 25.98*a* | 186,546 | 11.22 | 34,650 | 9.37 | 23,660 | 5.94 | 8,960 | 4.90 | 5,910 | 5.31 | 2,800 |
| 3 | 20.66*a* | 107,171 | 10.92 | 32,690 | 9.17 | 22,680 | 5.92 | 8,890 | 4.88 | 5,860 | 5.40 | 2,850 |
| 4 | 15.31*a* | 64,000 | 10.62 | 30,770 | 8.92 | 21,480 | 5.92 | 8,890 | 4.86 | 5,810 | 5.43 | 2,880 |
| 5 | 14.51*a* | 58,991 | 10.74 | 31,540 | 8.68 | 20,380 | 5.91 | 8,860 | 4.82 | 5,720 | 5.32 | 2,810 |
| 6 | 14.43 | 58,610 | 10.81 | 31,980 | 8.56 | 19,830 | 5.84 | 8,640 | 4.76 | 5,570 | 5.22 | 2,730 |
| 7 | 14.22 | 56,850 | 10.74 | 31,540 | 8.46 | 19,370 | 5.76 | 8,380 | 4.76 | 5,570 | 5.14 | 2,640 |
| 8 | 13.54 | 51,320 | 10.79 | 31,860 | 8.46 | 19,370 | 5.69 | 8,160 | 4.48*b* | 4,950 | 5.06 | 2,560 |
| 9 | 12.87 | 46,240 | 10.71 | 31,340 | 8.42 | 19,190 | 5.71 | 8,220 | 4.40 | 4,750 | 5.01 | 2,480 |
| 10 | 12.41 | 42,870 | 10.60 | 30,640 | 8.12 | 17,840 | 5.58 | 7,810 | 4.40 | 4,230 | 4.90 | 2,400 |
| 11 | 12.12 | 40,840 | 10.72 | 31,410 | 7.90 | 16,850 | 5.66 | 8,060 | 4.48 | 4,100 | 4.84 | 2,400 |
| 12 | 12.12 | 40,840 | 10.60 | 30,640 | 7.78 | 16,310 | 5.76 | 8,380 | .....*c* | 4,000 | 4.85 | 2,390 |
| 13 | 12.16 | 41,120 | 10.14 | 27,840 | 7.67 | 15,820 | 5.86 | 8,700 | ..... | 3,850 | 4.85 | 2,380 |
| 14 | 12.18 | 41,260 | 9.89 | 26,410 | 7.60 | 15,500 | 5.92 | 8,890 | ..... | 3,710 | 4.80 | 2,370 |
| 15 | 11.94 | 39,580 | 9.78 | 25,810 | 7.53 | 15,190 | 5.82 | 8,570 | ..... | 3,600 | 4.77 | 2,330 |
| 16 | 11.75 | 38,250 | 9.74 | 25,600 | 7.34 | 14,380 | 5.71 | 8,220 | ..... | 3,480 | 4.75 | 2,280 |
| 17 | 11.63 | 37,410 | 9.60 | 24,840 | 7.10 | 13,370 | 5.59 | 7,840 | ..... | 3,330 | 4.68 | 2,200 |
| 18 | 11.38 | 35,710 | 9.48 | 24,200 | 6.90 | 12,550 | 5.48 | 7,490 | ..... | 3,200 | 4.58 | 2,090 |
| 19 | 11.00 | 33,200 | 9.30 | 23,320 | 6.77 | 12,030 | 5.37 | 7,190 | .....*c* | 3,100 | 4.47 | 1,930 |
| 20 | 15.63 | 69,450 | 9.18 | 22,730 | 6.63 | 11,470 | 5.36 | 7,160 | 5.17 | 2,990 | 4.40 | 1,780 |
| 21 | 16.88 | 81,950 | 9.10 | 22,340 | 6.44 | 10,730 | 5.35 | 7,130 | 5.41 | 2,860 | 4.40 | 1,790 |
| 22 | 16.49 | 77,900 | 9.01 | 21,900 | 6.32 | 10,300 | 5.26 | 6,880 | 5.53 | 2,750 | 4.47 | 1,880 |
| 23 | 16.00 | 73,000 | 9.00 | 21,850 | 6.21 | 9,910 | 5.24 | 6,820 | 5.65 | 2,620 | 4.55 | 1,980 |
| 24 | 15.32 | 66,180 | 9.00 | 21,850 | 6.22 | 9,940 | 5.19 | 6,680 | 5.57 | 2,650 | 4.55 | 1,990 |
| 25 | 14.55 | 59,640 | 9.14 | 22,540 | 6.21 | 9,910 | 5.08 | 6,370 | 5.49 | 2,680 | 4.49 | 1,910 |
| 26 | 13.94 | 54,520 | 9.44 | 24,010 | 6.18 | 9,800 | 5.05 | 6,290 | 5.41 | 2,700 | 4.43 | 1,880 |
| 27 | 13.44 | 50,500 | 10.56 | 30,380 | 6.08 | 9,440 | 5.01 | 6,180 | 5.39 | 2,720 | 4.43 | 1,860 |
| 28 | 12.95 | 46,830 | 11.34 | 35,440 | 6.00 | 9,150 | 4.95 | 6,030 | 5.38 | 2,730 | 4.38 | 1,820 |
| 29 | 12.66 | 44,680 | 10.78 | 31,790 | 6.09 | 9,470 | 4.98 | 6,100 | 5.35 | 2,720 | 4.28 | 1,800 |
| 30 | 12.34 | 42,380 | 10.14 | 27,840 | 6.12 | 9,580 | 4.98 | 6,100 | 5.30 | 2,720 | 4.25 | 1,750 |
| 31 | 11.88 | 39,160 | 9.78 | 25,810 | ..... | ..... | 5.00 | 6,150 | ..... | ..... | 4.19 | 1,700*b* |

*a* Mean gauge height and discharge from hourly records. Maximum gauge height, July 2, 26.42; maximum discharge, 200,000.
*b* to *b* Ice conditions.
*c* to *c* Discharge interpolated.

MONTHLY DISCHARGE of North Saskatchewan River at Prince Albert, for 1915.

(Drainage area 59,900*a* square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 2,150 | 1,280 | 1,760 | 0.0294 | 0.03 | 108,219 |
| February | 1,800 | 1,550 | 1,655 | 0.0276 | 0.03 | 91,914 |
| March | 2,050 | 1,570 | 1,707 | 0.0285 | 0.03 | 104,960 |
| April | 18,500 | 2,250 | 9,046 | 0.1510 | 0.17 | 538,274 |
| May | 10,700 | 4,820 | 7,003 | 0.1169 | 0.13 | 430,597 |
| June | 42,660 | 9,940 | 25,023 | 0.4177 | 0.47 | 488,972 |
| July | 186,546 | 33,200 | 60,224 | 1.0054 | 1.16 | 3,703,029 |
| August | 36,430 | 21,850 | 28,129 | 0.4696 | 0.54 | 1,729,585 |
| September | 24,460 | 9,150 | 14,999 | 0.2504 | 0.28 | 892,503 |
| October | 9,190 | 6,030 | 7,653 | 0.1278 | 0.15 | 470,564 |
| November | 6,010 | 2,620 | 3,896 | 0.0650 | 0.07 | 231,828 |
| December | 2,880 | 1,700 | 2,238 | 0.0374 | 0.04 | 137,609 |
| The year | ..... | ..... | ..... | ..... | 3.10 | 8,928,054 |

*a* The drainage area in this table is only approximate.
It must be remembered that the greater part of the run-off at this station is derived from the eastern slope of the Rocky Mountains, and must not be used to base estimates of run-off on other streams in this vicinity.

LITTLE RED RIVER NEAR PRINCE ALBERT.

*Location.*—On the SW. ¼ Sec. 26, Tp. 49, Rge. 26, W. 2nd Mer.

*Records available.*—July 14, 1915, to October 31, 1915.

*Gauge.*—Vertical staff. Zero elevation has been maintained at an elevation of 89 62 feet since establishment.

*Bench-mark.*—Spike in top of 8 inch poplar stump 100 feet upstream from gauge on right bank. Elevation assumed, 100.00 feet.

*Channel.*—Shifting silt; gauge height affected by logs lying in or being driven down river.

*Discharge measurements.*—Made with meter at or near gauge by wading, or from bridge one mile downstream.

*Fluctuations in flow.*—Caused by artificial regulation of lake outlets.

*Winter flow.*—Discharge measurements have been made, but no gauge height observations taken.

*Observer.*—Mrs. A. Charnbury.

DISCHARGE MEASUREMENTS of Little Red River near Prince Albert, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| July 14 | F. K. Beach | 48.0 | 77.0 | 1.20 | 2.60 | 92.0 |
| Aug. 17 | do | 32.0 | 22.0 | 0.48 | 1.05 | 9.6 |
| Sept. 11 | do | 47.4 | 97.0 | 0.94 | 2.88 | 90.0 |
| Oct. 8 | do | 40.5 | 55.0 | 1.50 | 1.32 | 82.0 |
| Nov. 5 | F. R. Steinberger | 25.5 | 18.5 | 0.69 | 0.02 | 12.8 |
| Nov. 23 | do | 25.0 | 10.0 | 0.74 | 0.26 | 7.4 |
| Dec. 10 | do | 12.0 | 6.9 | 0.53 | 0.06 | 3.7 |

DAILY GAUGE HEIGHT AND DISCHARGE of Little Red River near Prince Albert, for 1915.

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.52 | 88.0 | 3.34 | 117.0 | 2.24 | 142.0 |
| 2 | ..... | ..... | 2.46 | 83.0 | 2.05 | 47.0 | 2.32 | 147.0 |
| 3 | ..... | ..... | 1.89 | 54.0 | 2.56 | 73.0 | 1.94 | 121.0 |
| 4 | ..... | ..... | 1.86 | 51.0 | 1.88 | 39.0 | 1.62 | 101.0 |
| 5 | ..... | ..... | 1.70 | 44.0 | 1.37 | 18.8 | 2.31 | 147.0 |
| 6 | ..... | ..... | 1.58 | 38.0 | 1.10 | 10.8 | 2.30 | 146.0 |
| 7 | ..... | ..... | 1.46 | 32.0 | 1.01 | 8.6 | 1.62 | 101.0 |
| 8 | ..... | ..... | 1.40 | 29.0 | 1.12 | 11.4 | 1.52 | 94.0 |
| 9 | ..... | ..... | 1.32 | 25.0 | 2.68 | 79.0 | 1.88 | 118.0 |
| 10 | ..... | ..... | 1.32 | 25.0 | 2.90 | 91.0 | 1.45 | 90.0 |
| 11 | ..... | ..... | ..... | 23.0*b* | 2.88 | 90.0 | 1.80 | 112.0 |
| 12 | ..... | ..... | ..... | 21.0 | 3.15 | 106.0 | 1.26 | 79.0 |
| 13 | ..... | ..... | ..... | 19.0 | 3.10 | 103.0 | 1.16 | 72.0 |
| 14 | 2.32 | 77*c* | ..... | 17.0 | 2.58 | 74.0 | 1.12 | 69.0 |
| 15 | 2.62 | 93 | ..... | 15.0 | 3.11 | 104.0 | 1.06 | 66.0 |
| 16 | 1.99 | 60 | ..... | 12.0*b* | 2.95 | 94.0 | 1.09 | 67.0 |
| 17 | 1.77 | 49 | 1.06 | 9.8*c* | 2.82 | 87.0 | 1.06 | 66.0 |
| 18 | 2.24 | 73 | 1.05 | 9.6 | 2.18 | 61.0*d* | 0.16 | 20.0 |
| 19 | 3.21 | 130 | 1.06 | 9.8 | 2.59 | 102.0 | 0.14 | 19.8 |
| 20 | 3.24 | 131 | 1.06 | 9.8 | 2.51 | 113.0 | 0.14 | 19.8 |
| 21 | 3.13 | 125 | 1.03 | 9.1 | 2.50 | 125.0 | 0.14 | 19.8 |
| 22 | 2.18 | 70 | 1.06 | 9.8 | 2.50 | 142.0 | 0.13 | 19.4 |
| 23 | 1.75*a* | 48 | 1.02 | 8.9 | 3.17 | 213.0*d* | 0.14 | 19.8 |
| 24 | 1.32 | 29 | 0.83 | 4.4 | 3.00 | 199.0 | 0.14 | 19.8 |
| 25 | 2.27 | 74 | 0.82 | 4.2 | 2.54 | 164.0 | 0.14 | 19.8 |
| 26 | 2.06 | 63 | 0.77 | 3.1 | 2.52 | 162.0 | 0.14 | 19.8 |
| 27 | 3.86 | 168 | 0.76 | 2.9 | 2.47 | 159.0 | 0.12 | 19.1 |
| 28 | 2.18 | 70 | 0.74 | 2.4 | 2.20 | 139.0 | 0.11 | 18.7 |
| 29 | 2.30 | 76 | 0.72 | 2.0 | 2.20 | 139.0 | 0.12 | 19.1 |
| 30 | 2.04 | 62 | 2.20 | 54.0 | 2.20 | 139.0 | 0.12 | 19.1 |
| 31 | 2.72 | 97 | 1.45 | 22.0 | | | 0.11 | 18.7 |

*a* Gauge height interpolated.
*b–b* Discharge interpolated.
*c–c* Shifting conditions.
*d–d* Shifting conditions, logs running.

MONTHLY DISCHARGE of Little Red River near Prince Albert, for 1915.

(Drainage area 520 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| July (14–31) | 168 | 29.0 | 83 | 0.160 | 0.11 | 2,963 |
| August | 88 | 2.0 | 24 | 0.046 | 0.05 | 1,476 |
| September | 213 | 8.6 | 100 | 0.192 | 0.21 | 5,950 |
| October | 147 | 18.7 | 65 | 0.125 | 0.14 | 3,997 |
| The period | ..... | ..... | ..... | ..... | 0.51 | 14,386 |

MISCELLANEOUS DISCHARGE MEASUREMENTS made in North Saskatchewan River drainage basin, in 1915.

| Date. | Engineer. | Stream. | Location. | Width. | Area of Section. | Mean Velocity. | Discharge. |
|---|---|---|---|---|---|---|---|
| | | | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Sec.-ft.* |
| July 13 | .....a | Baptiste River | Near mouth of river | ..... | 219.60 | 3.16 | 695.00 |
| Aug. 30 | O. H. Hoover | Blackstone Creek | SW. 12–42–19–5 | 19.8 | 18.00 | 1.33 | 24.00 |
| Sept. 7 | do | Brazeau Creek | Outlet stream from Brazeau Lake in Tp. 39–22–5b | 50.0 | 90.60 | 4.68 | 424.00 |
| Jan. 15 | H. B. R. Thompson | Brazeau River | Above junction with Nordegg River | 212.0 | 208.00 | 1.31 | 274.00 |
| Jan. 16 | do | do | do | 212.0 | 208.00 | 1.27 | 267.00 |
| Mar. 3 | do | do | do | 206.0 | 90.20 | 2.77 | 250.00 |
| Mar. 4 | do | do | do | 206.0 | 90.20 | 2.76 | 250.00 |
| Sept. 2 | .....a | do | Below mouth of Nordegg River | ..... | 1717.50 | 1.93 | 3331.00 |
| Sept. 7 | O. H. Hoover | do | Above Brazeau Lake outlet in Tp. 39–22–5.....b | 47.0 | 86.30 | 1.63 | 141.00 |
| Aug. 23 | do | Brazeau River (So.) | Tp. 44–15–5.....b | 193.5 | 363.00 | 1.69 | 613.00 |
| Jan. 9 | H. B. R. Thompson | Buck Creek | Near Buck Lake, in Tp. 47–6–5....b | 39.0 | 23.70 | 0.64 | 15.30 |
| Jan. 23 | do | do | do b | 39.5 | 25.30 | 0.59 | 14.90 |
| Mar. 7 | do | do | do b | 43.0 | 21.10 | 0.72 | 15.20 |
| Mar. 10 | do | do | do b | 44.0 | 20.80 | 0.74 | 15.40 |
| June 24 | O. H. Hoover | Careless Creek | Tp. 35–18–5.....b | 27.4 | 35.60 | 5.81 | 207.00 |
| July 3 | do | do | do b | 22.5 | 37.40 | 5.86 | 219.00 |
| Sept. 13 | do | Cline River | Tp. 37–25–5.....b | 29.5 | 36.50 | 2.08 | 76.00 |
| Sept. 14 | do | Coral Creek | Tp. 37–19–5.....b | 31.0 | 22.90 | 2.88 | 66.00 |
| Sept. 13 | do | Corral Creek | Tp. 37–25–5.....b | 29.0 | 40.80 | 2.48 | 101.00 |
| June 7 | do | Creek | Tp. 40–15–5.....b | 5.0 | 1.94 | 0.99 | 1.90 |
| June 7 | do | do | Tp. 39–14–5.....b | 7.0 | 4.70 | 1.75 | 8.20 |
| June 7 | do | do | Tp. 39–15–5.....b | 5.9 | 2.57 | 0.76 | 1.96 |
| June 16 | do | do | Tp. 38–17–5.....b | 17.0 | 12.00 | 3.58 | 43.00 |
| July 3 | do | do | Tp. 35–19–5.....b | 14.2 | 8.36 | 2.75 | 23.00 |
| July 10 | do | do | Tp. 38–17–5.....b | 28.3 | 18.10 | 3.72 | 67.00 |
| July 10 | do | do | Tp. 38–17–5.....b | 16.5 | 8.05 | 3.58 | 29.00 |
| July 17 | do | do | Tp. 40–15–5.....b | 12.1 | 7.38 | 2.57 | 19.00 |
| July 17 | do | do | Tp. 39–14–5.....b | 16.7 | 12.00 | 3.42 | 41.00 |
| July 19 | do | do | Tp. 40–13–5.....b | 8.0 | 8.95 | 2.27 | 20.00 |
| July 19 | do | do | Tp. 40–13–5.....b | 15.7 | 12.00 | 2.76 | 33.00 |
| Aug. 24 | do | do | Tributary South Brazeau River, in Tp. 44–15–5 b | 17.0 | 22.10 | 0.73 | 16.10 |
| Aug. 29 | do | do | Tributary South Brazeau River, in Tp. 42–17–5...b | 10.3 | 4.10 | 0.76 | 3.10 |
| Sept. 2 | do | do | Tp. 43–20–5.....b | 15.5 | 9.98 | 2.31 | 23.00 |
| Sept. 11 | do | do | Tributary Brazeau River, in Tp. 38–22–5.....b | 14.5 | 7.20 | 1.29 | 9.30 |
| Sept. 11 | do | do | Tributary Brazeau River, in Tp. 38–22–5.....b | 42.0 | 59.80 | 0.90 | 54.00 |
| Sept. 11 | do | do | Tributary Brazeau River, in Tp. 38–22–5.....b | 11.4 | 12.30 | 1.27 | 15.60 |

*a* Measurement made by Department of Public Works while surveying reservoir sites in the vicinity.
*b* Approximate location.

MISCELLANEOUS DISCHARGE MEASUREMENTS made in North Saskatchewan River drainage basin, in 1915.

| Date. | Engineer. | Stream. | Location. | Width. | Area of Section. | Mean Velocity. | Discharge. |
|---|---|---|---|---|---|---|---|
| | | | | *Feet.* | *Sq.-ft.* | *Ft. per sec.* | *Sec.-ft.* |
| Oct. 15.... | O. H. Hoover..... | Creek ..... | Emptying into Mistaya River below Water Fowl Lakes, in Tp. 33–19–5.....*b* | 9.5 | 7.75 | 1.50 | 11.60 |
| Aug. 30.... | do ..... | George River..... | NW. 1–42–19–5... | 25.0 | 17.00 | 2.13 | 36.00 |
| July 1.... | do ..... | Glacier Creek..... | Tp. 34–21–5.....*b* | 36.0 | 107.00 | 5.23 | 560.00 |
| Oct. 20.... | .....*a* | do ..... | Outlet of Lake...*b* | ..... | 39.80 | 1.20 | 48.00 |
| June 24.... | do ..... | Goat Creek..... | Tp. 35–18–5.....*b* | 13.0 | 11.60 | 2.67 | 31.00 |
| June 14.... | do ..... | Haven Creek..... | Tp. 39–14–5.....*b* | 21.0 | 24.90 | 3.49 | 87.00 |
| July 12.... | do ..... | do ..... | do ....*b* | 43.5 | 44.10 | 2.79 | 123.00 |
| June 28.... | do ..... | Howse Creek..... | Tp. 33–21–5.....*b* | 38.0 | 47.20 | 4.75 | 224.00 |
| Sept. 4.... | do ..... | Isaac Creek..... | Tp. 41–21–5.....*b* | 32.0 | 28.40 | 3.03 | 86.00 |
| Feb. 11.... | E. W. W. Hughes.. | Little Red Deer River..... | Near Prince Albert | 22.0 | 11.40 | 0.42 | 4.80 |
| Feb. 27.... | do .. | do | do | 18.0 | 10.45 | 0.27 | 2.90 |
| Mar. 16.... | do .. | do | do | 18.7 | 10.80 | 0.42 | 4.50 |
| Mar. 18.... | do .. | do | do | 18.7 | 10.78 | 0.42 | 4.50 |
| April 1.... | do .. | do | do | 16.7 | 15.38 | 0.60 | 9.25 |
| May 5.... | O. H. Hoover..... | Martin Creek..... | SE. 27–40–15–5... | 2.8 | 0.37 | 0.76 | 0.28 |
| June 11.... | do ..... | do ..... | do ... | 7.2 | 6.52 | 1.02 | 6.60 |
| Oct. 12.... | do ..... | Mistaya River.... | At Peyto Lake, in Tp. 32–18–5...*b* | 9.5 | 9.45 | 2.12 | 20.00 |
| Oct. 14.... | do ..... | do .... | Above Lower Lake, in Tp. 33–19–5 *b* | 31.0 | 28.40 | 2.39 | 68.00 |
| Oct. 16.... | do ..... | do .... | Above Silverhorn Creek, in Tp. 33–19–5.....*b* | 37.0 | 43.30 | 1.20 | 52.00 |
| Oct. 16.... | do ..... | do .... | Below Lower Lake, in Tp. 33–19–5 *b* | 17.5 | 22.10 | 3.03 | 67.00 |
| Aug. 21.... | do ..... | Mud Creek..... | Tp. 42–16–5.....*b* | 17.6 | 16.40 | 1.22 | 20.00 |
| Jan. 15.... | do ..... | Nordegg River.... | At junction of Brazeau River..... | 62.0 | 54.60 | 0.38 | 21.00 |
| Jan. 16.... | do ..... | do .... | do | 62.0 | 54.60 | 0.41 | 23.00 |
| Mar. 3.... | H. B. R. Thompson | do .... | do | 53.0 | 17.20 | 1.20 | 21.00 |
| Mar. 4.... | do | do .... | do | 53.0 | 17.20 | 1.28 | 22.00 |
| Sept. 2.... | .....*a* | do .... | Near mouth of River..... | ..... | 126.80 | 1.38 | 175.00 |
| Jan. 13.... | do | North Saskatchewan River..... | Above junction of Brazeau River... | 330.0 | 565.00 | 1.55 | 876.00 |
| Jan. 14.... | do | do | do | 330.0 | 565.00 | 1.55 | 880.00 |
| Feb. 9.... | E. W. W. Hughes.. | do | La Colle Falls..... | 597.0 | 1758.00 | 1.06 | 1,863.00 |
| Mar. 1.... | H. B. R. Thompson | do | Above junction with Brazeau River... | 315.0 | 418.00 | 1.77 | 744.00 |
| Mar. 2.... | do | do | do | 315.0 | 418.00 | 1.78 | 745.00 |
| Mar. 14.... | E. W. W. Hughes.. | do | La Colle Falls..... | 585.0 | 1574.00 | 1.06 | 1,662.00 |
| Mar. 14.... | do .. | do | do ..... | 585.0 | 1575.00 | 1.06 | 1,662.00 |
| June 6.... | O. H. Hoover..... | do | At Brazeau Gap... | 199.0 | 936.60 | 4.39 | 4,111.00 |
| June 28.... | do ..... | do | Above Howse Creek, in Tp. 33–21–5 .....*b* | .....*c* | 170.40 | .....*c* | 1,173.00 |
| Oct. 19.... | do ..... | do | Above West Branch in Tp. 34–20–5 *b* | 103.0 | 116.00 | 1.39 | 161.00 |
| Oct. 19.... | do ..... | N. Saskatchewan River (N. Bch.).. | Tp. 34–20–5.....*b* | 110.0 | 101.00 | 2.91 | 294.00 |
| Sept. 3.... | do ..... | Opabin Creek..... | Tp. 42–20–5.....*b* | 23.0 | 15.20 | 1.71 | 26.00 |
| Oct. 16.... | do ..... | Silverhorn Creek.. | Tp. 33–19–5.....*b* | 17.0 | 5.45 | 1.10 | 6.00 |
| Aug. 30.... | do ..... | Smith Creek..... | SW. 7–42–18–5... | 12.5 | 5.15 | 0.93 | 4.80 |
| June 7.... | do ..... | Sulphur Spring.... | Tp. 40–15–5.....*b* | 2.1 | 0.35 | 0.49 | 0.17 |
| Oct. 7.... | do ..... | Wilson Creek..... | Tp. 35–20–5.....*b* | 8.5 | 6.70 | 1.61 | 10.80 |

*a* Measurement made by Department of Public Works while surveying reservoir sites in the vicinity.
*b* Approximate location.
*c* Not compiled, as stream comprises three channels.

## RED DEER RIVER DRAINAGE BASIN.

*General Description.*

The Red Deer River rises in the Sawback Range of the Rockies in the northern portion of the Rocky Mountain Park, near the boundary between the provinces of Alberta and British Columbia. It flows eastward for about forty miles, then northeastward for seventy or eighty miles to a point near Red Deer, Alberta. From here the river flows in a southeasterly and easterly direction to its junction with the South Saskatchewan River, just east of the 4th Mer., in Tp. 22, Rge. 28, W. 3rd Mer. It has a length of approximately 400 miles.

The valley of the Red Deer is wide and deep, the banks being rough and cut up with a large number of deep coulees, draining into the river. Near the source the basin is well timbered, and a good growth of timber is found along its banks for some distance out into the prairie. Seams of coal, well suited for domestic use, are found in the valley and form the principal source of fuel supply for the settlers along the stream in the prairie section.

The river carries a considerable supply of water at all times of the year, but the volume is subject to sudden variations, due to the melting of snow in the mountains and heavy summer rains.

Of the tributaries of the Red Deer, the most important are, the Panther River near its head, Little Red Deer and Medicine Rivers, entering in Tp. 36, Rge. 1, W. 5th Mer., and Rosebud River emptying into it in Tp. 28, Rge. 19, W. 4th Mer. In addition, there are numerous small streams draining into the main river in the western portion of the basin. From the mouth of the Rosebud River eastward there is very little drainage into the river.

Very little water is taken from the Red Deer and its branches for irrigation purposes. There are only a few small schemes on some of the smaller tributaries. The land along the valley, though lacking moisture, is extremely fertile, and with the help of irrigation much of it might be cultivated and fine crops produced. The irrigation of the bench land from the river would be difficult on account of the small fall in the river, the depth of the valley, and the rolling nature of the lands in the drainage basin.

Very little hydrometric work has been done in this basin as yet. A gauging station was established on the Red Deer River near Innisfail, in 1910, but an observer could not be secured and only periodic discharge measurements have been secured at this station. In December 1911, another gauging station was established at the town of Red Deer, and continuous records have been obtained since then.

Of the tributaries of Red Deer River, Berry and Blood Indian Creeks are the only ones that have been given any attention. These small creeks, which drain into the river in the prairie section, have a few small irrigation rights registered against them. Gauging stations were established on them in 1911, but owing to the high cost of obtaining data they were abandoned in 1913.

A special report upon the floods in this drainage basin is given in Appendix No. 4 of this report.

### RED DEER RIVER AT RED DEER.

*Location.*—On the SE. ¼ Sec. 20, Tp. 38, Rge. 27, W. 4th Mer., at the steel traffic bridge in the town of Red Deer.

*Records available.*—January 1, 1912, to December 31, 1915.

*Gauge.*—Chain. Length of chain from bottom of weight to marker is 29.52 feet. Zero elevation of gauge maintained at 84.40 feet since establishment.

*Bench-mark.*—Marked with white paint on northwest face of north abutment. Assumed elevation, 100.00 feet.

*Channel.*—Slightly shifting.

*Discharge measurements.*—Made from bridge.

*Winter flow.*—From November to April river is frozen over and measurements are made at a point about one-half mile below the bridge.

*Floods.*—This stream was in flood June 26 to July 22, reaching a maximum gauge height of 19.05 feet at 9.20 p.m. on June 27. Maximum discharge, 68,000 sec.-feet. On July 18, it again rose to a gauge height of 15.83.

*Observer.*—C. H. Snell.

PLATE 12

North Saskatchewan River in flood at Edmonton, on June 28, 1915. General view looking west from left bank. Taken a few hours before the maximum height was reached. Taken by I. R. Strome.

PLATE 13

Red Deer River in flood at Red Deer, on June 27, 1915. Looking upstream at Canadian Pacific Railway Company's bridge, about time of maximum stage. Taken by Inspector Lindsay, R. N. W. M. P.

## Discharge Measurements of Red Deer River at Red Deer, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 12 | H. S. Kerby | 250 | 279 | 1.01 | 3.84 | 283 |
| Feb. 13 | H. W. Rowley | 240 | 274 | 1.02 | 4.12 | 280 |
| Feb. 23 | do | 250 | 268 | 1.02 | 4.14 | 275 |
| April 13 | I. R. Strome | 233 | 543 | 1.85 | 3.71 | 980 |
| April 30 | do | 235 | 552 | 1.88 | 3.83 | 1,038 |
| May 18 | do | 357 | 1,443 | 4.37 | 6.85 | 6,299 |
| June 12 | do | 376 | 1,605 | 4.45 | 7.05 | 7,144 |
| June 28 | H. M. Nelson | 420 | 5,668 | 10.00 | 17.39 | 56,454 |
| June 29 | do | 420 | 3,798 | 7.81 | 12.86 | 29,660 |
| June 30 | do | 420 | 3,135 | 6.77 | 11.52 | 21,231 |
| July 1 | do | 418 | 2,886 | 6.06 | 10.60 | 17,486 |
| July 10 | I. R. Strome | 383 | 2,119 | 3.39 | 7.59 | 7,177 |
| July 30 | do | 418 | 3,471 | 5.60 | 10.54 | 19,481 |
| Sept. 2 | do | 364 | 1,542 | 2.97 | 6.29 | 4,581 |
| Sept. 22 | do | 352 | 1,331 | 2.72 | 5.77 | 3,618 |
| Oct. 9 | do | 354 | 1,318 | 2.56 | 5.62 | 3,370 |
| Oct. 25 | do | 281 | 1,057 | 2.19 | 5.09 | 2,315 |
| Dec. 1 | F. K. Beach | 310 | 531 | 1.07 | 5.85 | 570 |
| Dec. 30 | do | 300 | 325 | 1.43 | 5.83 | 466 |

## Daily Gauge Height and Discharge of Red Deer River at Red Deer, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.88*a* | 330 | 3.99 | 265 | 4.16 | 285 | 4.31 | 1,674 | 3.90 | 1,175 | 6.06 | 4,692 |
| 2 | 3.88 | 325 | 4.03 | 270 | 4.17 | 285 | 4.38 | 1,772 | 4.17 | 1,494 | 6.35 | 5,330 |
| 3 | 3.86 | 320 | 4.06 | 270 | 4.17 | 290 | 4.37 | 1,758 | 4.18 | 1,506 | 7.89 | 9,270 |
| 4 | 3.85 | 310 | 4.07 | 280 | 4.16 | 290 | 4.44 | 1,856 | 4.43 | 1,842 | 8.40 | 10,800 |
| 5 | 3.86 | 305 | 4.07 | 280 | 4.15 | 290 | 4.40 | 1,800 | 4.78 | 2,350 | 7.90 | 9,300 |
| 6 | 3.85 | 300 | 4.09 | 265 | 4.15 | 290 | 4.45 | 1,870 | 4.98 | 2,668 | 7.72 | 8,760 |
| 7 | 3.85 | 290 | 4.09 | 265 | 4.15 | 295 | 4.36 | 1,744 | 5.04 | 2,768 | 7.43 | 7,965 |
| 8 | 3.79 | 285 | 4.09 | 270 | 4.15 | 300 | 4.24 | 1,582 | 5.34 | 3,282 | 7.41 | 7,915 |
| 9 | 3.76 | 270 | 4.10 | 270 | 4.14 | 300 | 4.08 | 1,386 | 5.81 | 4,170 | 7.41 | 7,915 |
| 10 | 3.75 | 265 | 4.09 | 270 | 4.15 | 310 | 3.98 | 1,266 | 5.61 | 3,784 | 7.08 | 7,090 |
| 11 | 3.80 | 270 | 4.11 | 270 | 4.13 | 320 | 3.85 | 1,120 | 5.39 | 3,372 | 6.98 | 6,840 |
| 12 | 3.84 | 285 | 4.12 | 275 | 4.05 | 325 | 3.79 | 1,054 | 5.06 | 2,802 | 7.06 | 7,040 |
| 13 | 3.87 | 300 | 4.12 | 280 | 4.09 | 330 | 3.75 | 1,010 | 4.84 | 2,444 | 7.15 | 7,265 |
| 14 | 3.87 | 300 | 4.10 | 280 | 4.12 | 340 | 3.76 | 1,021 | 5.01 | 2,717 | 7.29 | 7,615 |
| 15 | 3.90 | 280 | 4.04 | 275 | 4.11 | 345 | 3.74 | 1,001 | 6.47 | 5,608 | 7.37 | 7,815 |
| 16 | 3.89 | 260 | 4.10 | 270 | 4.08 | 355 | 3.70 | 965 | 6.99 | 6,865 | 7.27 | 7,565 |
| 17 | 3.88 | 270 | 4.10 | 260 | 4.10 | 375 | 3.67 | 938 | 6.94 | 6,740 | 7.28 | 7,590 |
| 18 | 3.87 | 280 | 4.11 | 260 | 4.20 | 410 | 3.65 | 920 | 6.91 | 6,665 | 7.67 | 8,616 |
| 19 | 3.86 | 300 | 4.11 | 260 | 4.73 | 450 | 3.66 | 929 | 6.67 | 6,088 | 7.72 | 8,760 |
| 20 | 3.91 | 285 | 4.13 | 265 | 4.87 | 530 | 3.65 | 920 | 6.44 | 5,536 | 7.60 | 8,420 |
| 21 | 3.95 | 275 | 4.15 | 270 | 5.49 | 600 | 3.75 | 1,010 | 6.29 | 5,198 | 7.45 | 8,015 |
| 22 | 3.97 | 270 | 4.16 | 270 | 5.44 | 680 | 3.77 | 1,032 | 6.32 | 5,264 | 7.27 | 7,565 |
| 23 | 3.96 | 260 | 4.17 | 275 | 5.27 | 770 | 3.66 | 929 | 6.36 | 5,352 | 7.07 | 7,065 |
| 24 | 3.99 | 255 | 4.12 | 275 | 5.60 | 870 | 3.66 | 929 | 6.39 | 5,418 | 7.02 | 6,940 |
| 25 | 3.96 | 245 | 4.13 | 270 | 5.75 | 1,000 | 3.82 | 1,087 | 6.70 | 6,160 | 7.39 | 7,865 |
| 26 | 3.98 | 240 | 4.14 | 275 | 5.64 | 1,120 | 3.95 | 1,230 | 7.06 | 7,040 | 9.36 | 13,810 |
| 27 | 3.99 | 240 | 4.15 | 275 | 5.35 | 1,220 | 3.98 | 1,266 | 6.99 | 6,865 | 17.30 | 56,000 |
| 28 | 4.01 | 245 | 4.15 | 280 | 5.07 | 1,320 | 3.95 | 1,230 | 6.67 | 6,088 | 16.80 | 52,580 |
| 29 | 4.01 | 250 | ..... | ..... | 4.85 | 1,430 | 3.85 | 1,120 | 6.51 | 5,704 | 13.25 | 30,775 |
| 30 | 3.97 | 250 | ..... | ..... | 4.63 | 1,500 | 3.84 | 1,109 | 6.62 | 5,968 | 11.50 | 22,075 |
| 31 | 3.97 | 260 | ..... | ..... | 4.20*a* | 1,560 | | | 6.31 | 5,242 | | |

*a* to *a* Ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Red Deer River at Red Deer, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 10.73 | 18,585 | 9.45 | 13,388 | 6.34 | 4,570 | 5.56 | 3,186 | 4.93 | 2,222 | 5.90 | 570 |
| 2 | 10.28 | 16,640 | 9.10 | 12,150 | 6.29 | 4,471 | 5.66 | 3,347 | 4.89 | 2,166 | 5.89 | 585 |
| 3 | 9.56 | 13,800 | 8.58 | 10,390 | 6.61 | 5,116 | 5.86 | 3,687 | 4.81 | 2,054 | 6.32 | 600 |
| 4 | 8.92 | 11,520 | 8.21 | 9,280 | 6.43 | 4,750 | 6.15 | 4,205 | 4.75 | 1,975 | 6.41 | 610 |
| 5 | 8.41 | 9,880 | 7.90 | 8,350 | 6.27 | 4,433 | 6.17 | 4,243 | 4.69 | 1,897 | 6.48 | 615 |
| 6 | 8.21 | 9,280 | 7.58 | 7,448 | 6.16 | 4,224 | 6.05 | 4,025 | 4.68 | 1,884 | 6.48 | 610 |
| 7 | 8.05 | 8,800 | 7.37 | 6,881 | 6.09 | 4,097 | 5.89 | 3,738 | 4.44 | 1,588 | 6.38 | 595 |
| 8 | 8.03 | 8,740 | 7.26 | 6,625 | 6.19 | 4,281 | 5.73 | 3,466 | 4.50 | 1,660 | 6.39 | 570 |
| 9 | 7.85 | 8,200 | 7.05 | 6,120 | 6.18 | 4,262 | 5.64 | 3,314 | 4.50 | 1,660 | 6.40 | 550 |
| 10 | 7.61 | 7,528 | 6.93 | 5,832 | 6.21 | 4,319 | 5.56 | 3,186 | 4.24 | 1,354 | 6.19 | 520 |
| 11 | 7.45 | 7,110 | 6.80 | 5,530 | 6.17 | 4,243 | 5.51 | 3,106 | 5.02 | 1,320 | 6.02 | 500 |
| 12 | 7.18 | 6,432 | 6.64 | 5,179 | 6.04 | 4,007 | 5.48 | 3,058 | 6.61 | 1,260*a* | 5.98 | 495 |
| 13 | 7.03 | 6,072 | 6.54 | 4,970 | 5.93 | 3,809 | 5.43 | 2,978 | 6.86*b* | 1,220 | 5.70 | 490 |
| 14 | 8.09 | 8,920 | 6.52 | 4,930 | 5.87 | 3,704 | 5.37 | 2,882 | 7.11*b* | 1,170 | 5.83 | 485 |
| 15 | 13.20 | 30,500 | 6.43 | 4,750 | 5.84 | 3,653 | 5.33 | 2,818 | 7.36*b* | 1,120 | 5.93 | 480 |
| 16 | 12.98 | 29,400 | 6.32 | 4,530 | 5.89 | 3,738 | 5.28 | 2,740 | 7.52 | 1,080 | 5.95 | 480 |
| 17 | 13.51 | 32,205 | 6.36 | 4,610 | 5.87 | 3,704 | 5.25 | 2,695 | 7.65 | 1,040 | 5.99 | 490 |
| 18 | 15.83 | 46,200 | 6.30 | 4,490 | 5.83 | 3,636 | 5.21 | 2,635 | 7.51 | 1,000 | 6.07 | 490 |
| 19 | 14.78 | 37,580 | 6.68 | 5,266 | 5.81 | 3,602 | 5.20 | 2,620 | 7.06 | 930 | 5.97 | 500 |
| 20 | 12.84 | 28,700 | 8.98 | 11,730 | 5.89 | 3,738 | 5.21 | 2,635 | 6.89 | 860 | 6.03 | 510 |
| 21 | 11.65 | 22,788 | 13.25 | 30,775 | 5.89 | 3,738 | 5.19 | 2,605 | 6.77 | 810 | 6.04 | 520 |
| 22 | 10.69 | 18,405 | 10.24 | 16,470 | 5.77 | 3,534 | 5.21 | 2,635 | 6.56 | 740 | 5.95 | 510 |
| 23 | 10.19 | 16,260 | 8.98 | 11,730 | 5.73 | 3,466 | 5.20 | 2,620 | 6.65 | 690 | 5.99 | 510 |
| 24 | 9.87 | 14,980 | 8.12 | 9,010 | 5.85 | 3,670 | 5.14 | 2,530 | 6.63 | 650 | 6.00 | 500 |
| 25 | 9.49 | 13,538 | 7.65 | 7,638 | 6.09 | 4,097 | 5.08 | 2,440 | 6.40 | 615 | 6.01 | 490 |
| 26 | 9.21 | 12,535 | 7.32 | 6,775 | 5.99 | 3,917 | 5.02 | 2,350 | 6.44 | 590 | 6.00 | 485 |
| 27 | 8.82 | 11,170 | 7.08 | 6,192 | 5.85 | 3,670 | 4.98 | 2,292 | 6.38 | 580 | 6.01 | 475 |
| 28 | 8.50 | 10,150 | 6.86 | 5,664 | 5.75 | 3,500 | 4.96 | 2,264 | 6.26 | 570 | 5.97 | 470 |
| 29 | 10.76 | 18,720 | 6.68 | 5,266 | 5.69 | 3,398 | 4.94 | 2,236 | 5.90 | 570 | 5.93 | 470 |
| 30 | 10.69 | 18,405 | 6.54 | 4,970 | 5.61 | 3,266 | 4.92 | 2,208 | 6.05 | 565 | 5.83 | 465 |
| 31 | 10.16 | 16,140 | 6.42 | 4,730 | ..... | ..... | 4.93 | 2,222 | ..... | ..... | 5.74 | 470*a* |

*a* to *a* Ice conditions.
*b* Gauge height interpolated.

MONTHLY DISCHARGE of Red Deer River at Red Deer, for 1915.

(Drainage area 4,500 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 330 | 240 | 278 | 0.062 | 0.07 | 17,094 |
| February | 280 | 260 | 271 | 0.060 | 0.06 | 15,051 |
| March | 1,560 | 285 | 606 | 0.135 | 0.16 | 37,261 |
| April | 1,870 | 920 | 1,251 | 0.278 | 0.31 | 74,440 |
| May | 7,040 | 1,175 | 4,457 | 0.990 | 1.14 | 274,050 |
| June | 56,000 | 4,692 | 12,308 | 2.740 | 3.06 | 732,377 |
| July | 46,200 | 6,072 | 16,748 | 3.720 | 4.29 | 1,029,795 |
| August | 30,775 | 4,490 | 8,118 | 1.800 | 2.08 | 499,157 |
| September | 5,116 | 3,266 | 3,954 | 0.879 | 0.98 | 235,279 |
| October | 4,243 | 2,208 | 2,934 | 0.652 | 0.75 | 180,405 |
| November | 2,222 | 565 | 1,195 | 0.266 | 0.30 | 71,107 |
| December | 615 | 465 | 520 | 0.116 | 0.13 | 31,974 |
| The year | ..... | ..... | ..... | ..... | 13.33 | 3,197,990 |

BLINDMAN RIVER NEAR BLACKFALDS.

*Location.*—On the NE. ¼ Sec. 16, Tp. 39, Rge. 27, W. 4th Mer., at the traffic bridge over the Blindman River, about two miles southwest of the town of Blackfalds and on the old Edmonton trail. About 200 feet downstream from the Canadian Pacific Railway bridge.

*Records.*—Miscellaneous measurements were made at this station from August 10, 1912, to July 1, 1914, and since that time regular measurements have been made.

*Gauge.*—No gauge established owing to the difficulty of procuring an observer.

*Bench-mark.*—Painted with white paint on the upstream face of the concrete pier on the right bank, and marked with a broad arrow. Assumed elevation, 100.00 feet.

*Channel.*—One fairly permanent channel, mud and large boulders.

*Discharge measurements.*—Made from a bridge.

*Winter measurements.*—Stream affected by ice from November to April.

*Floods.*—A highwater mark of 98.14 feet was reached on or about June 27, 1915, and the discharge was approximately 2,560 sec.-feet.

*Observer.*—None.

DISCHARGE MEASUREMENTS of Blindman River near Blackfalds, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Elevation of Water Surface. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Feb. 6 | H. S. Kerby | 90 | 125 | 0.09 | 91.11 | 11.4 |
| Feb. 27 | H. W. Rowley | 41 | 38 | 0.24 | 90.97 | 9.1 |
| Mar. 20 | R. J. McGuinness | 62 | 138 | 0.98 | 91.88 | 135.0 |
| April 17 | I. R. Strome | 64 | 126 | 0.97 | 91.55 | 122.0 |
| May 5 | do | 66 | 144 | 1.24 | 91.86 | 178.0 |
| May 22 | do | 64 | 125 | 0.77 | 91.51 | 96.0 |
| June 8 | do | 94 | 286 | 2.44 | 93.44 | 697.0 |
| July 12 | do | 97 | 322 | 2.36 | 93.63 | 758.0 |
| Aug. 14 | do | 68 | 130 | 0.79 | 91.53 | 102.0 |
| Sept. 1 | do | 67 | 122 | 0.72 | 91.50 | 88.0 |
| Sept. 21 | do | 69 | 146 | 1.02 | 91.71 | 148.0 |
| Oct. 12 | do | 68 | 144 | 0.98 | 91.70 | 141.0 |
| Oct. 23 | do | 68 | 138 | 0.89 | 91.60 | 123.0 |
| Dec. 4 | F. K. Beach | 64 | 108 | 0.28 | ..... | 30.0 |
| Dec. 30 | do | 58 | 117 | 0.27 | 91.60 | 32.0 |

No gauge at station. Elevation of water surface taken on each visit to station.

RED DEER RIVER AT DRUMHELLER.

*Location.*—On the NW. ¼ Sec. 11, Tp. 29, Rge. 20, W. 4th Mer.

*Records available.*—October 25 to December 31, 1915.

*Gauge.*—Vertical staff. Elevation of zero maintained at 2,220.22 feet.

*Bench-mark.*—Canadian topographic survey bench-mark copper plug on right abutment, downstream side. Elevation, 2,246.89 feet.

*Channel.*—Permanent.

*Discharge measurements.*—Made from bridge.

*Observer.*—S. W. Cameron.

*Remarks.*—This station was established on October 25, 1915.

DISCHARGE MEASUREMENTS of Red Deer River at Drumheller, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Nov. 27 | F. K. Beach | 322.5 | 978 | 1.07 | 4.13 | 1,051 |
| Dec. 22 | do | 330.0 | 1,119 | 0.67 | 4.90 | 754 |

DAILY GAUGE HEIGHT AND DISCHARGE of Red Deer River at Drumheller, for 1915.

| Day. | October. | | November. | | December. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 4.17 | ..... | 4.67 | 1,055 |
| 2 | ..... | ..... | 4.17 | ..... | 4.85 | 1,055 |
| 3 | ..... | ..... | 4.16 | ..... | 4.76 | 1,053 |
| 4 | ..... | ..... | 4.11 | ..... | 4.66 | 1,050 |
| 5 | ..... | ..... | 4.05 | ..... | 4.75 | 1,047 |
| 6 | ..... | ..... | 3.97*a* | ..... | 4.77 | 1,045 |
| 7 | ..... | ..... | 3.94 | ..... | 5.00 | 1,042 |
| 8 | ..... | ..... | 3.94 | ..... | 5.00 | 1,040 |
| 9 | ..... | ..... | 3.81 | ..... | 4.83 | 1,037 |
| 10 | ..... | ..... | 3.46 | ..... | 5.14 | 1,030 |
| 11 | ..... | ..... | 3.18 | ..... | 5.25 | 1,021 |
| 12 | ..... | ..... | 3.12 | ..... | 5.34 | 1,015 |
| 13 | ..... | ..... | 3.26 | ..... | 5.38 | 993 |
| 14 | ..... | ..... | 2.81 | ..... | 5.27 | 972 |
| 15 | ..... | ..... | 3.34 | ..... | 5.15 | 946 |
| 16 | ..... | ..... | 3.46 | ..... | 5.15 | 918 |
| 17 | ..... | ..... | 3.67 | ..... | 5.00 | 885 |
| 18 | ..... | ..... | 3.69 | ..... | 5.00 | 860 |
| 19 | ..... | ..... | 3.89 | ..... | 4.95 | 840 |
| 20 | ..... | ..... | 4.10 | ..... | 4.95 | 817 |
| 21 | ..... | ..... | 4.35 | ..... | 4.98 | 790 |
| 22 | ..... | ..... | 4.24 | ..... | 4.90 | 754 |
| 23 | ..... | ..... | 3.95 | ..... | 4.85 | 748 |
| 24 | ..... | ..... | 4.07 | ..... | 4.50 | 690 |
| 25 | 4.41 | ..... | 4.10 | ..... | 4.72 | 696 |
| 26 | 4.37 | ..... | 4.13 | ..... | 4.60 | 680 |
| 27 | 4.33 | ..... | 4.16 | 1,051 | 4.60 | 655 |
| 28 | 4.27 | ..... | 4.45 | 1,055 | 4.45 | 633 |
| 29 | 4.24 | ..... | 4.34 | 1,055 | 4.40 | 618 |
| 30 | 4.25 | ..... | 4.60 | 1,055 | 4.42 | 610 |
| 31 | 4.17 | ..... | ..... | ..... | 4.20*a* | 535 |

First measurement made Nov. 27.
*a–a* Ice conditions Nov. 6 to Dec. 31.

MONTHLY DISCHARGE of Red Deer River at Drumheller, for 1915.

(Drainage area 8,890 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| November (27–30) | 1,055 | 1,051 | 1,054 | 0.119 | 0.02 | 8,360 |
| December | 1,055 | 535 | 875 | 0.0986 | 0.11 | 53,802 |
| The period | ..... | ..... | ..... | ..... | 0.13 | 62,162 |

First measurement made Nov. 27.

## SOUTH SASKATCHEWAN RIVER DRAINAGE BASIN.

### *General Description.*

The upper portion of this drainage basin will be dealt with in the descriptions of the drainage basins of Bow, Little Bow, Oldman, Waterton, Belly and St. Mary Rivers. These streams are all conjoined at a point known as the Grand Forks, to form the South Saskatchewan River. From the Grand Forks the river flows in a north and easterly direction to its junction with the North Saskatchewan River a short distance east of the city of Prince Albert. From this point onward the stream takes the name of Saskatchewan River.

After the confluence of the Bow and Oldman Rivers the stream receives comparatively little drainage, the principal tributaries being the Red Deer River, draining that portion of the basin between the North and the South Saskatchewan River, and Sevenpersons River and Swiftcurrent Creek emptying into the main stream from the south. Descriptions of the drainage basins of all these streams are given elsewhere in this report.

The drainage basin of this stream is quite similar to that of all such streams which have their source in the mountains and flow across the prairies. The upper portion of the basin has considerable fall, with rock and gravel formation and a good growth of timber. In contrast to this the prairie section of the basin is sparsely wooded, except along the banks of the stream, and the rock formation changes to earth; also the stream is more apt to change its channel, especially in times of flood. The high water occurs in the hot months of summer and is caused by the melting of the snow fields in the mountains. The low water occurs in the winter months when there is no melting snow to augment the stream flow. Unusually high water and floods follow rains of more than usual intensity in the upper section of the river. The South Saskatchewan River is much less liable to destructive floods than is the North Saskatchewan River.

In addition to the gauging stations on the tributaries, which are taken up in detail elsewhere in this report, there are two stations on the main streams. These stations are located at the cities of Medicine Hat and Saskatoon.

Up to the present the chief value of this stream has been as a source of municipal water supply. There are no irrigation schemes or water power developments on the main stream.

The cities of Medicine Hat and Saskatoon derive their water supply from this stream. The South Saskatchewan is also being considered as a possible source of supply for the cities of Moosejaw and Regina. In this connection surveys were carried out during 1913 by this department and also by the Provincial Government.

A special report upon the floods in this drainage basin is given in Appendix No. 4 of this report.

#### SOUTH SASKATCHEWAN RIVER AT MEDICINE HAT.

*Location.*—On the NW. ¼ Sec. 31, Tp. 12, Rge. 5, W. 4th Mer., at the traffic bridge in the city of Medicine Hat.

*Records available.*—From May 31, 1911, to December 31, 1915.

*Gauge.*—Standard chain gauge. Zero elevation maintained at 79 78 feet since establishment

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100 00 feet.

*Channel.*—Shifting, owing to sand bed.

*Discharge measurements.*—Made from traffic bridge.

*Winter flow.*—Observations taken during winter months.

*Floods.*—Few records of floods at this point are available. The highest water of which we have record took place June 28, 1915, with a stage of 15 30 feet and a flow of 90,020 sec.-ft.

*Observer.*—W. King.

DISCHARGE MEASUREMENTS of South Saskatchewan River at Medicine Hat, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 7 | J. E. Caughey | 433 | 2,660 | 1.00 | 3.26 | 2,653 |
| Feb. 12, 13 | F. R. Steinberger | 510 | 1,850 | 1.04 | 2.87 | 1,892 |
| Mar. 3, 4 | do | 515 | 1,810 | 1.07 | 3.09 | 1,944 |
| April 7 | H. B. R. Thompson | 504 | 3,461 | 1.89 | 3.25 | 6,528 |
| April 22 | do | 506 | 3,443 | 1.84 | 3.26 | 6,346 |
| May 31 | R. J. McGuinness | 759 | 6,278 | 3.43 | 7.00 | 21,551 |
| June 9 | do | 792 | 7,312 | 3.92 | 7.85 | 28,665 |
| June 28 | W. H. Snelson | 852 | 13,121 | 6.84 | 15.30 | 89,797 |
| June 28 | do | 847 | 12,144 | 6.44 | 14.02 | 78,179 |
| June 29 | do | 849 | 12,212 | 6.15 | 14.22 | 75,035 |
| June 30 | do | 845 | 10,562 | 5.39 | 12.20 | 56,915 |
| July 2 | do | 834 | 9,192 | 5.04 | 10.58 | 46,333 |
| July 3 | do | 834 | 9,180 | 5.09 | 10.58 | 46,757 |
| July 16 | H. B. R. Thompson | 836 | 7,865 | 4.95 | 10.00 | 38,935 |
| Aug. 24 | do | 751 | 5,616 | 3.64 | 7.16 | 20,450 |
| Sept. 21 | do | 531 | 3,419 | 2.07 | 3.87 | 7,076 |
| Oct. 16 | do | 531 | 2,987 | 2.09 | 3.93 | 6,244 |
| Nov. 9 | W. R. McCaffrey | 502 | 3,489 | 1.72 | 3.42 | 6,013 |
| Nov. 25 | do | 617 | 3,290 | 0.96 | 4.86 | 3,146 |
| Dec. 6 | do | 509 | 3,274 | 0.95 | 3.97 | 3,109 |
| Dec. 18 | do | 464 | 2,686 | 0.82 | 2.97 | 2,211 |

DAILY GAUGE HEIGHT AND DISCHARGE of South Saskatchewan River at Medicine Hat, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.37 | 2,830 | 2.66 | 1,890 | 2.80 | 2,000 | 4.00 | 7,830 | 3.35 | 5,895 | 7.03 | 21,714 |
| 2 | 3.33 | 2,860 | 2.52 | 1,960 | 2.85 | 1,990 | 3.12 | 5,292 | 3.32 | 5,814 | 6.94 | 21,192 |
| 3 | 3.34 | 2,840 | 2.54 | 2,010 | 2.90 | 1,980 | 3.42 | 6,084 | 3.40 | 6,030 | 6.77 | 20,219 |
| 4 | 3.37 | 2,800 | 2.60 | 2,015 | 3.05 | 1,960 | 3.52 | 6,358 | 4.98 | 11,458 | 6.76 | 20,162 |
| 5 | 3.37 | 2,790 | 2.70 | 2,010 | 2.80 | 1,950 | 3.72 | 6,940 | 6.31 | 17,664 | 7.87 | 26,633 |
| 6 | 3.28 | 2,730 | 2.70 | 2,020 | 2.90 | 1,970 | 3.28 | 5,708 | 6.13 | 16,716 | 8.09 | 27,949 |
| 7 | 3.30 | 2,650 | 2.50 | 2,030 | 2.91 | 1,980 | 3.15 | 5,370 | 5.96 | 15,854 | 8.42 | 30,028 |
| 8 | 3.32 | 2,700 | 2.20 | 2,020 | 3.01 | 1,980 | 2.91 | 4,774 | 5.82 | 15,176 | 8.25 | 28,945 |
| 9 | 3.30 | 2,800 | 2.70 | 2,025 | 2.95 | 1,990 | 3.10 | 5,240 | 5.67 | 14,472 | 7.86 | 26,574 |
| 10 | 3.28 | 2,770 | 3.00 | 2,030 | 3.00 | 2,000 | 2.72 | 4,349 | 5.78 | 14,986 | 7.86 | 26,574 |
| 11 | 3.32 | 2,730 | 3.21 | 1,980 | 3.02 | 2,000 | 2.68 | 4,261 | 6.73 | 19,991 | 7.74 | 25,866 |
| 12 | 3.10 | 2,650 | 3.00 | 1,900 | 2.78 | 1,820 | 2.61 | 4,107 | 6.99 | 21,482 | 7.76 | 25,984 |
| 13 | 3.07 | 2,570 | 2.86 | 1,890 | 2.84 | 1,840 | 2.61 | 4,107 | 6.92 | 21,076 | 7.56 | 24,804 |
| 14 | 2.92 | 2,440 | 2.95 | 1,900 | 2.92 | 1,870 | 2.64 | 4,173 | 6.93 | 21,134 | 7.46 | 24,214 |
| 15 | 3.00 | 2,160 | 2.92 | 1,930 | 3.00 | 1,900 | 2.32 | 3,490 | 6.84 | 20,618 | 7.38 | 23,744 |
| 16 | 3.05 | 1,970 | 2.95 | 1,950 | 3.05 | 1,940 | 2.31 | 3,470 | 7.88 | 26,692 | 7.74 | 25,866 |
| 17 | 3.05 | 2,000 | 2.98 | 1,970 | 3.16 | 2,120 | 2.78 | 4,481 | 8.74 | 32,100 | 8.18 | 28,506 |
| 18 | 3.05 | 2,080 | 3.18 | 1,980 | 3.38 | 3,000 | 2.90 | 4,750 | 8.16 | 28,382 | 8.42 | 30,028 |
| 19 | 2.98 | 2,160 | 2.75 | 1,980 | 3.20 | 5,500*a* | 2.86 | 4,660 | 7.70 | 25,630 | 8.28 | 29,134 |
| 20 | 2.88 | 2,200 | 2.78 | 1,980 | 4.25 | 8,600 | 2.86 | 4,660 | 7.62 | 25,158 | 9.30 | 35,780 |
| 21 | 2.80 | 2,200 | 2.75 | 1,970 | 5.78 | 14,900 | 3.16 | 5,396 | 7.52 | 24,568 | 9.58 | 37,700 |
| 22 | 2.78 | 2,140 | 2.72 | 1,980 | 5.75 | 14,800 | 3.17 | 5,422 | 7.12 | 22,236 | 9.23 | 35,311 |
| 23 | 2.75 | 2,040 | 2.78 | 1,990 | 5.91 | 15,600 | 3.15 | 5,370 | 6.60 | 19,260 | 8.82 | 32,620 |
| 24 | 2.75 | 1,950 | 2.90 | 2,000 | 6.08 | 16,400 | 3.56 | 6,474 | 6.61 | 19,316 | 8.38 | 29,772 |
| 25 | 2.76 | 1,860 | 3.12 | 2,020 | 6.12 | 16,650 | 3.82 | 7,244 | 6.48 | 18,590 | 8.05 | 27,705 |
| 26 | 2.90 | 1,780 | 2.90 | 2,030 | 5.48 | 13,600 | 3.48 | 6,246 | 6.61 | 19,316 | 8.28 | 29,134 |
| 27 | 2.90 | 1,740 | 2.78 | 2,020 | 5.51 | 13,700 | 3.59 | 6,561 | 7.02 | 21,656 | 9.00 | 33,790 |
| 28 | 2.80 | 1,720 | 2.78 | 2,010 | 5.15 | 12,150 | 3.42 | 6,084 | 7.33 | 23,454 | 14.83 | 84,700 |
| 29 | 2.74 | 1,730 | ..... | ..... | 4.65 | 10,150*a* | 3.32 | 5,814 | 7.12 | 22,236 | 14.18 | 77,400 |
| 30 | 2.62 | 1,750 | ..... | ..... | 3.75 | 7,030 | 3.25 | 5,630 | 7.00 | 21,540 | 12.05 | 56,200 |
| 31 | 2.58 | 1,810 | ..... | ..... | 3.42 | 6,084 | ..... | ..... | 6.99 | 21,482 | ..... | ..... |

*a*–*a* Estimated.

PLATE 14

South Saskatchewan River in flood at Saskatoon, on July 3, 1915. Taken at time of maximum stage. High level traffic bridge in background.
Taken by F. K. Beach.

PLATE 15

South Saskatchewan River in flood at Saskatoon, on July 4, 1915. Taken shortly after maximum stage. Shows the Canadian Northern Railway Company's bridge, where our gaugings are made. Taken by F. K. Beach.

DAILY GAUGE HEIGHT AND DISCHARGE of South Saskatchewan River at Medicine Hat, for 1915. —*Concluded.*

| DAY. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 10.98 | 47,896 | 8.91 | 33,205 | 4.72 | 10,418 | 4.06 | 8,028 | 3.44 | 6,138 | 3.42 | 3,130 |
| 2 | 10.55 | 44,650 | 8.30 | 29,260 | 4.45 | 9,395 | 4.01 | 7,863 | 4.00 | 7,830 | 2.90 | 3,120 |
| 3 | 10.55 | 44,650 | 8.30 | 29,260 | 4.75 | 10,535 | 3.92 | 7,566 | 3.38 | 5,976 | 3.90 | 3,120 |
| 4 | 10.14 | 41,668 | 8.10 | 28,010 | 4.60 | 9,960 | 3.90 | 7,500 | 3.63 | 6,677 | 4.00 | 3,130 |
| 5 | 9.94 | 40,244 | 7.76 | 25,984 | 4.50 | 9,580 | 3.94 | 7,632 | 3.39 | 6,003 | 4.88 | 3,140 |
| 6 | 9.42 | 36,596 | 7.34 | 23,512 | 4.88 | 11,050 | 3.40 | 6,030 | 3.45 | 6,165 | 3.97 | 3,109 |
| 7 | 9.20 | 35,110 | 7.10 | 22,120 | 4.92 | 11,212 | 3.94 | 7,632 | 3.37 | 5,949 | 4.06 | 2,970 |
| 8 | 9.10 | 34,450 | 6.84 | 20,618 | 4.57 | 9,846 | 4.04 | 7,962 | 3.32 | 5,814 | 4.38 | 2,870 |
| 9 | 8.88 | 33,010 | 6.65 | 19,540 | 4.38 | 9,138 | 4.08 | 8,034 | 3.41 | 6,057 | 4.58 | 2,700 |
| 10 | 9.04 | 34,054 | 6.39 | 18,096 | 4.38 | 9,138 | 4.24 | 8,640 | 3.01 | 5,680*c* | 4.45 | 2,550 |
| 11 | 8.64 | 31,450 | 6.20 | 17,080 | 4.65 | 10,150 | 4.16 | 8,364 | 2.99 | 4,700 | 4.23 | 2,350 |
| 12 | 8.25 | 28,945 | 6.07 | 16,407 | 4.22 | 8,570 | 4.08 | 8,094 | 3.41 | 4,500 | 3.99 | 2,150 |
| 13 | 7.95 | 27,105 | 5.90 | 15,560 | 4.43 | 9,321 | 3.94 | 7,632 | 3.13 | 4,420 | 2.98 | 2,070 |
| 14 | 7.62 | 25,158 | 5.74 | 14,798 | 4.44 | 9,358 | 3.88 | 7,436 | 3.16 | 4,350 | 3.01 | 2,090 |
| 15 | 7.28 | 23,164 | 5.63 | 14,288 | 4.24 | 8,640 | 3.96 | 7,698 | 3.47 | 4,250 | 2.97 | 2,100 |
| 16 | 9.92 | 40,102 | 5.63 | 14,288 | 3.98 | 7,764 | 3.70 | 6,880 | 3.94 | 4,150 | 2.91 | 2,130 |
| 17 | 9.24 | 35,378 | 5.56 | 13,966 | 3.90 | 7,500 | 3.79 | 7,150 | 4.18 | 4,030 | 3.25 | 2,170 |
| 18 | 8.52 | 30,670 | 5.54 | 13,874 | 3.72 | 6,940 | 3.87 | 7,404 | 4.64 | 3,880 | 2.97 | 2,211 |
| 19 | 9.38 | 36,324 | 5.42 | 13,330 | 3.85 | 7,340 | 3.87 | 7,404 | 4.93*b* | 3,750 | 2.37 | 2,270 |
| 20 | 9.75 | 38,895 | 5.40 | 13,240 | 3.68 | 6,822 | 3.65 | 6,735 | 5.32 | 3,630 | 2.45 | 2,300 |
| 21 | 9.12 | 34,582 | 5.46 | 13,510 | 3.78 | 7,120 | 3.59 | 6,561 | 5.62 | 3,480 | 2.86 | 2,330 |
| 22 | 8.52 | 30,670 | 6.25 | 17,345 | 3.95 | 7,665 | 3.59 | 6,561 | 5.27 | 3,350 | 2.94 | 2,280 |
| 23 | 8.05 | 27,705 | 7.73 | 25,807 | 3.99 | 7,797 | 3.62 | 6,648 | 6.01 | 3,240 | 3.06 | 2,240 |
| 24 | 7.82 | 26,338 | 7.26 | 23,048 | 4.02 | 7,896 | 3.54 | 6,416 | 5.68 | 3,160 | 2.81 | 2,170 |
| 25 | 7.68 | 25,512 | 6.44 | 18,370 | 3.85 | 7,340 | 3.59 | 6,561 | 4.91*b* | 3,146 | 2.75 | 2,100 |
| 26 | 7.61 | 25,099 | 5.94 | 15,756 | 4.12 | 8,228 | 3.42 | 6,084 | 5.01 | 3,145 | 2.90 | 2,000 |
| 27 | 7.48 | 24,332 | 5.58 | 14,058 | 4.41 | 9,247 | 3.48 | 6,246 | 4.39 | 3,170 | 2.78 | 1,900 |
| 28 | 7.66 | 25,394 | 5.39 | 13,196 | 4.54 | 9,732 | 3.42 | 6,084 | 3.63 | 3,180 | 2.79 | 1,850 |
| 29 | 7.78 | 26,102 | 5.22 | 12,456 | 4.28 | 8,780 | 3.26 | 5,656 | 3.71 | 3,150 | 3.19 | 1,800 |
| 30 | 8.55 | 30,865 | 5.10 | 11,950 | 4.04 | 7,962 | 3.34 | 5,868 | 4.12 | 3,140 | 2.81 | 1,710 |
| 31 | 9.45 | 36,800 | 4.78 | 10,652 | ..... | ..... | 3.40 | 6,030 | ..... | ..... | 2.88 | 1,660 |

*b–b* Gauge heights interpolated from readings to top of ice.
*c* Ice conditions from Nov. 10.

MONTHLY DISCHARGE of South Saskatchewan River at Medicine Hat, for 1915.

(Drainage area 20,870 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 2,860 | 1,720 | 2,305 | 0.110 | 0.13 | 141,728 |
| February | 2,030 | 1,890 | 1,982 | 0.095 | 0.10 | 110,075 |
| March | 16,650 | 1,820 | 6,176 | 0.030 | 0.35 | 379,747 |
| April | 7,830 | 3,470 | 5,345 | 0.256 | 0.29 | 318,050 |
| May | 32,100 | 5,814 | 19,354 | 0.927 | 1.07 | 1,190,031 |
| June | 84,700 | 20,162 | 32,275 | 1.547 | 1.73 | 1,920,496 |
| July | 47,896 | 23,164 | 32,997 | 1.581 | 1.82 | 2,028,906 |
| August | 33,205 | 10,652 | 18,470 | 0.880 | 1.01 | 1,135,676 |
| September | 11,212 | 6,822 | 8,845 | 0.422 | 0.47 | 524,529 |
| October | 8,640 | 5,656 | 7,112 | 0.341 | 0.39 | 437,300 |
| November | 7,830 | 3,140 | 4,537 | 0.217 | 0.24 | 269,970 |
| December | 3,140 | 1,660 | 2,378 | 0.114 | 0.13 | 146,218 |
| The year | ..... | ..... | ..... | ..... | 7.73 | 8,602,726 |

SOUTH SASKATCHEWAN RIVER AT SASKATOON.

*Location.*—On the SW. ¼ Sec. 28, Tp. 36, Rge. 5, W. 3rd Mer., at the Canadian Northern Railway bridge in the city of Saskatoon.

*Records available.*—May 27, 1911, to December 31, 1915.

*Gauge.*—Chain. Elevation of zero maintained at 1,543.22 feet since establishment

*Bench-marks.*—Painted mark on side of downstream end of left abutment. Elevation, 1,568.98 feet, referred to a bench-mark on top of hydrant 300 feet northeast; elevation, 1,586.94 feet (Geodetic survey datum) and to Geodetic B.M., No.30, brass plug in south end Canadian Northern Railway station. Elevation, 1,593.14 feet above mean sea level.

*Channel.*—Permanent.

*Maximum flow.*—A gauge height of 20.85 feet with discharge of 114,100 sec.-feet was reached on July 3, 1915.

*Open water.*—April 4 to November 11, 1915.

*Discharge measurements.*—From bridge.

*Observer.*—A. B. Hay.

DISCHARGE MEASUREMENTS of South Saskatchewan River at Saskatoon, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 11, 12, 13 | F. R. Steinberger | 509.0 | 1,772 | 1.91 | 4.41 | 3,385 |
| Feb. 12, 13 | E. W. W. Hughes | 527.0 | 1,371 | 1.73 | 4.04 | 2,366 |
| Mar. 4, 5 | do | 522.0 | 1,554 | 1.74 | 4.02 | 2,708 |
| Mar. 22 | do | 536.0 | 1,779 | 1.75 | 4.03 | 3,118 |
| April 13, 14 | do | 627.0 | 3,847 | 3.25 | 6.16 | 12,504 |
| May 3, 4 | do | 523.0 | 2,858 | 2.69 | 4.79 | 7,701 |
| June 10, 11 | F. K. Beach | 784.0 | 9,000 | 5.00 | 12.12 | 45,000 |
| July 1 | do | 793.5 | 9,444 | 5.67 | 12.75 | 53,515 |
| July 1 | do | 815.5 | 12,462 | 6.85 | 16.40 | 85,344 |
| July 2 | do | 829.5 | 15,750 | 7.20 | 20.45 | 113,539 |
| July 3 | do | 829.5 | 16,028 | 7.12 | 20.80 | 114,131 |
| July 3 | do | 829.0 | 15,842 | 7.01 | 20.60 | 111,161 |
| July 9 | do | 801.5 | 10,483 | 5.56 | 14.00 | 58,233 |
| Aug. 13, 14 | do | 772.5 | 7,495 | 4.08 | 9.84 | 30,566 |
| Sept. 9, 10 | do | 701.5 | 4,651 | 3.55 | 6.95 | 16,516 |
| Oct. 6, 7 | do | 627.5 | 4,165 | 3.48 | 6.47 | 14,530 |
| Nov. 2, 3 | F. R. Steinberger | 573.0 | 3,480 | 2.74 | 5.39 | 9,554 |
| Dec. 17, 18 | do | 517.0 | 2,787 | 1.48 | 6.10 | 4,141 |

DAILY GAUGE HEIGHT AND DISCHARGE of South Saskatchewan River at Saskatoon, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.80*a* | 3,200 | 4.17 | 2,400 | 4.18 | 2,750 | 5.32 | 7,200 | 4.65 | 7,375 | 9.11 | 26,505 |
| 2 | 3.98 | 3,400 | 4.12 | 2,400 | 4.05 | 2,750 | 7.30 | 13,800 | 4.81 | 7,830 | 9.40 | 28,100 |
| 3 | 4.02 | 3,450 | 4.07 | 2,300 | 4.03 | 2,750 | 10.13 | 25,956 | 4.81 | 7,830 | 9.63 | 29,365 |
| 4 | 4.05 | 3,050 | 4.08 | 2,200 | 4.00 | 2,700 | 9.05*a* | 26,220 | 4.86 | 7,980 | 9.75 | 30,025 |
| 5 | 4.10 | 3,250 | 4.09 | 2,200 | 4.03 | 2,700 | 11.95 | 43,880 | 4.91 | 8,130 | 9.61 | 29,255 |
| 6 | 4.12 | 3,450 | 4.12 | 2,200 | 4.08 | 2,750 | 8.42 | 22,800 | 4.86 | 7,980 | 9.58 | 29,090 |
| 7 | 4.10 | 2,800 | 4.05 | 2,150 | 4.16 | 2,800 | 7.68 | 19,160 | 4.85 | 7,950 | 9.51 | 28,705 |
| 8 | 4.10 | 3,000 | 3.97 | 2,150 | 4.12 | 2,800 | 7.85 | 19,950 | 4.87 | 8,010 | 9.35 | 27,825 |
| 9 | 4.18 | 3,400 | 3.91 | 2,150 | 4.08 | 2,900 | 8.00 | 20,700 | 4.79 | 7,770 | 9.38 | 27,990 |
| 10 | 4.28 | 3,500 | 3.89 | 2,200 | 4.06 | 2,900 | 7.90 | 20,200 | 4.91 | 8,130 | 10.84 | 36,775 |
| 11 | 4.38 | 3,400 | 3.84 | 2,200 | 4.05 | 3,000 | 7.65 | 19,025 | 5.64 | 10,490 | 12.19 | 45,435 |
| 12 | 4.40 | 3,400 | 3.83 | 2,300 | 4.05 | 3,000 | 6.60 | 14,420 | 7.37 | 17,765 | 11.66 | 42,025 |
| 13 | 4.45 | 3,500 | 3.98 | 2,350 | 4.05 | 3,000 | 6.40 | 13,580 | 7.52 | 18,440 | 11.28 | 39,590 |
| 14 | 4.50 | 3,600 | 3.82 | 2,350 | 4.09 | 3,050 | 6.02 | 11,985 | 7.47 | 18,215 | 10.99 | 37,735 |
| 15 | 4.62 | 3,700 | 3.86 | 2,300 | 4.14 | 3,100 | 5.75 | 10,900 | 7.40 | 17,900 | 10.89 | 37,095 |
| 16 | 4.65 | 3,800 | 3.90 | 2,200 | 4.10 | 3,100 | 5.54 | 10,140 | 7.52 | 18,440 | 10.72 | 36,010 |
| 17 | 4.65 | 4,000 | 3.90 | 2,150 | 4.07 | 3,100 | 5.32 | 9,370 | 8.12 | 21,300 | 10.69 | 35,815 |
| 18 | 4.60 | 4,100 | 3.84 | 2,150 | 4.07 | 3,100 | 5.14 | 8,820 | 8.92 | 25,460 | 10.56 | 34,985 |
| 19 | 4.55 | 4,100 | 3.79 | 2,200 | 4.10 | 3,100 | 4.98 | 8,340 | 9.22 | 27,110 | 10.34 | 33,610 |
| 20 | 4.55 | 4,100 | 3.92 | 2,200 | 4.07 | 3,100 | 4.86 | 7,980 | 9.20 | 27,000 | 10.34 | 33,610 |
| 21 | 4.55 | 4,000 | 4.08 | 2,350 | 4.02 | 3,100 | 4.72 | 7,560 | 9.08 | 26,340 | 10.39 | 33,920 |
| 22 | 4.48 | 3,900 | 4.18 | 2,450 | 4.06 | 3,100 | 4.55 | 7,125 | 10.08 | 31,995 | 11.04 | 38,055 |
| 23 | 4.40 | 3,600 | 4.12 | 2,600 | 4.12 | 3,200 | 4.38 | 6,715 | 10.53 | 34,790 | 11.31 | 39,785 |
| 24 | 4.32 | 3,400 | 4.11 | 2,600 | 4.16 | 3,400 | 4.35 | 6,650 | 10.41 | 34,040 | 11.41 | 40,425 |
| 25 | 4.24 | 3,200 | 4.16 | 2,700 | 4.25 | 3,600 | 4.42 | 6,810 | 10.27 | 33,175 | 11.97 | 44,010 |
| 26 | 4.24 | 3,000 | 4.18 | 2,700 | 4.22 | 3,800 | 4.47 | 6,930 | 10.11 | 32,180 | 12.61 | 48,170 |
| 27 | 4.30 | 2,900 | 4.19 | 2,750 | 4.18 | 4,000 | 4.42 | 6,810 | 9.93 | 31,080 | 12.23 | 45,695 |
| 28 | 4.37 | 2,800 | 4.24 | 2,750 | 4.23 | 4,400 | 4.45 | 6,880 | 9.71 | 29,805 | 11.75 | 42,600 |
| 29 | 4.36 | 2,650 | ..... | ..... | 4.25 | 4,800 | 4.56 | 7,150 | 9.33 | 27,715 | 11.57 | 41,450 |
| 30 | 4.31 | 2,600 | ..... | ..... | 4.36 | 5,200 | 4.55 | 7,125 | 9.08 | 26,340 | 11.45 | 40,680 |
| 31 | 4.22 | 2,500 | ..... | ..... | 4.68 | 5,800 | ..... | ..... | 8.95 | 25,625 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of South Saskatchewan River at Saskatoon, for 1915. —*Concluded.*

| DAY. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 12.70*a* | 53,298 | 11.91 | 43,625 | 9.03 | 26,355 | 6.15 | 13,325 | 5.44 | 9,820*c* | 4.51 | 4,200 |
| 2 | 20.05*a* | 111,008 | 11.86 | 43,305 | 8.63 | 24,350 | 6.13 | 13,255 | 5.39 | 9,615 | 5.16 | 4,300 |
| 3 | 20.60*a* | 111,012 | 11.89 | 43,495 | 8.33 | 22,885 | 6.19 | 13,465 | 5.37 | 9,545 | 5.48 | 4,400 |
| 4 | 17.80*a* | 84,617 | 12.71 | 48,870 | 8.07 | 21,635 | 6.21 | 13,540 | 5.17 | 8,910 | 5.57 | 4,500 |
| 5 | 14.95*a* | 66,312 | 13.79 | 56,645 | 7.77 | 20,240 | 6.43 | 14,420 | 5.12 | 8,760 | 5.56 | 4,400 |
| 6 | 14.87 | 64,810 | 12.91 | 50,270 | 7.58 | 19,370 | 6.48 | 14,620 | 5.05 | 8,550 | 5.56 | 4,300 |
| 7 | 14.83 | 64,510 | 12.43 | 46,995 | 7.41 | 18,605 | 6.24 | 13,660 | 5.02 | 8,460 | 5.60 | 4,250 |
| 8 | 14.47 | 61,770 | 12.25 | 45,825 | 7.15 | 17,460 | 6.10 | 13,120*c* | 5.10 | 8,700 | 5.88 | 4,300 |
| 9 | 14.04 | 58,505 | 11.89 | 43,495 | 6.96 | 16,630 | 6.10 | 13,090 | 5.44 | 9,790 | 6.12 | 4,300 |
| 10 | 13.68 | 55,830 | 11.30 | 39,720 | 6.90 | 16,380 | 6.12 | 13,130 | 5.37 | 9,545 | 6.18 | 4,100 |
| 11 | 13.01 | 50,970 | 10.68 | 35,750 | 6.72 | 15,625 | 6.14 | 13,170 | 4.80 | 7,800*b* | 6.00 | 3,750 |
| 12 | 12.85 | 49,850 | 10.48 | 34,475 | 6.92 | 16,465 | 6.15 | 13,175 | 3.62 | 5,270 | 6.16 | 4,050 |
| 13 | 12.63 | 48,310 | 10.10 | 32,120 | 7.09 | 17,195 | 6.22 | 13,400 | 3.25 | 4,780 | 5.99 | 3,750 |
| 14 | 12.31 | 46,215 | 9.75 | 30,150 | 6.93 | 16,505 | 6.45 | 14,290 | 3.06 | 4,400 | 6.06 | 3,900 |
| 15 | 12.21 | 45,565 | 9.38 | 28,175 | 6.69 | 15,500 | 6.50 | 14,460 | 2.94 | 4,200 | 6.14 | 4,150 |
| 16 | 12.03 | 44,395 | 9.08 | 26,615 | 6.52 | 14,785 | 6.50 | 14,430 | 3.04 | 4,250 | 6.04 | 4,100 |
| 17 | 11.71 | 42,345 | 8.98 | 26,100 | 6.62 | 15,205 | 6.41 | 14,040 | 3.35 | 4,300 | 6.05 | 4,150 |
| 18 | 11.23 | 39,270 | 8.85 | 25,450 | 6.62 | 15,205 | 6.28 | 13,500 | 3.48 | 4,350 | 6.16 | 4,200 |
| 19 | 10.88 | 37,030 | 8.63 | 24,350 | 6.57 | 14,995 | 6.20 | 13,100 | 3.61 | 4,350 | 6.28 | 4,800 |
| 20 | 10.78 | 36,390 | 8.37 | 23,075 | 6.46 | 14,540 | 6.10 | 12,660 | 3.64 | 4,400 | 6.22 | 4,700 |
| 21 | 14.77 | 64,050 | 8.12 | 21,875 | 6.42 | 14,380 | 6.07 | 12,525 | 3.73 | 4,400 | 6.11 | 4,500 |
| 22 | 15.77 | 71,705 | 8.09 | 21,730 | 6.34 | 14,060 | 6.04 | 12,370 | 3.65 | 4,250 | 5.85 | 4,000 |
| 23 | 16.37 | 76,460 | 7.97 | 21,160 | 6.20 | 13,500 | 5.98 | 12,120 | 3.91 | 4,400 | 5.73 | 3,600 |
| 24 | 17.87 | 88,595 | 7.87 | 20,700 | 6.12 | 13,220 | 5.88 | 11,690 | 4.28 | 4,500 | 5.63 | 3,000 |
| 25 | 16.44 | 77,020 | 7.75 | 20,150 | 6.04 | 12,940 | 5.78 | 10,260 | 4.45 | 4,500 | 5.44 | 2,750 |
| 26 | 15.17 | 67,090 | 7.73 | 20,060 | 5.94 | 12,590 | 5.85 | 11,510 | 4.42 | 4,250 | 5.45 | 2,800 |
| 27 | 14.38 | 61,090 | 7.99 | 21,255 | 5.88 | 12,380 | 5.70 | 10,880 | 4.35 | 4,300 | 5.46 | 2,850 |
| 28 | 13.52 | 54,650 | 11.71 | 42,345 | 5.86 | 12,310 | 5.60 | 10,500 | 4.44 | 4,400 | 5.34 | 2,750 |
| 29 | 12.90 | 50,200 | 11.99 | 44,135 | 5.91 | 12,485 | 5.52 | 10,190 | 4.52 | 4,450 | 5.39 | 2,550 |
| 30 | 12.56 | 47,840 | 10.37 | 33,795 | 6.03 | 12,905 | 5.54 | 10,230 | 4.42 | 4,300 | 5.74 | 2,900 |
| 31 | 12.29 | 46,085 | 9.56 | 29,125 | ..... | ..... | 5.49 | 10,025 | | ..... | 6.24 | 3,200*b* |

*a* Mean gauge height and discharge from frequent observations. Maximum gauge height July 3, 20.85, maximum discharge, 114,130.
*b–b* Ice conditions.
*c–c* Shifting conditions.

MONTHLY DISCHARGE of South Saskatchewan River at Saskatoon, for 1915.

(Drainage area 64,500*a* square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile | Depth in inches on Drainage Area | Total in Acre-feet |
| January | 4,100 | 2,500 | 3,379 | 0.052 | [illegible] | [illegible] |
| February | 2,750 | 2,150 | 2,345 | 0.036 | [illegible] | [illegible] |
| March | 5,800 | 2,700 | 3,318 | 0.051 | [illegible] | [illegible] |
| April | 43,880 | 6,620 | 18,472 | 0.286 | [illegible] | [illegible] |
| May | 34,790 | 7,375 | 19,813 | [illegible] | [illegible] | [illegible] |
| June | 48,170 | 26,505 | 36,144 | [illegible] | [illegible] | [illegible] |
| July | 111,012 | 36,380 | [illegible] | [illegible] | [illegible] | [illegible] |
| August | 56,645 | 20,060 | 31,704 | [illegible] | [illegible] | [illegible] |
| September | 26,355 | 12,310 | [illegible] | 0.284 | [illegible] | [illegible] |
| October | 14,620 | 10,025 | 12,714 | 0.197 | [illegible] | [illegible] |
| November | 9,820 | 4,200 | 6,118 | [illegible] | 0.11 | [illegible] |
| December | 4,800 | 2,750 | [illegible] | [illegible] | [illegible] | [illegible] |
| The year | | | | | [illegible] | [illegible] |

*a* The drainage area given in this table is only approximate. It must be remembered that the greater part of the run-off at this station is derived from the eastern slope of the Rocky Mountains, and must not be used to base estimates of run-off on other streams in this territory.

## BOW RIVER DRAINAGE BASIN.

*General Description.*

Bow River rises in Lakes Bow and Hector, which are situated in the Rocky Mountains Park, north of the main line of the Canadian Pacific Railway and just east of the Great Divide, and whose elevations are 6,420 and 5,694 feet, respectively, above mean sea level. The river flows in a south and easterly direction to the city of Calgary, where it takes a big bend to the south, and then continues in a south and easterly direction to its junction with the Belly River at the Grand Forks. Below this point the united stream is known as the South Saskatchewan River.

Bow River has a large number of tributaries in the western portion of its course. Of these the principal are Cascade and Ghost Rivers draining the northern slopes of the basin, and the Spray, Kananaskis, Elbow, Sheep and Highwood Rivers draining the southern slopes. Below the mouth of Highwood River, very little drainage reaches Bow River. Crowfoot Creek being the largest tributary, and so it appears that most of the water supply is derived from the run-off from mountains and foot-hills. As a result, Bow River possesses a normally steady flow throughout the year, but it is subject to sudden freshets caused by melting snow and heavy rains in the mountains. The minimum flow occurs in the frozen season, when there is little run-off from the snowfields in the western part of the drainage basin.

The valley of the Bow is deep and well defined throughout its course. In the mountain section it is comparatively narrow and is very heavily timbered, while its bed is stony and its banks high and rocky. The nature of the valley gradually changes as it approaches the prairies when it widens out, becomes of a clay formation and is devoid of trees, the actual bed consisting for the most part of gravel. The water is clean and pure. A large quantity of water is diverted from the Bow River for irrigation purposes. The two chief users are the Department of Natural Resources, Canadian Pacific Railway Company, and the Southern Alberta Land Company.

The Department of Natural Resources diverts water at two points, one just east of the city of Calgary and the other three miles southwest of Bassano. The first system has been in operation for several years and distributes water over the Western Section of the Company's Irrigation block, which extends east as far as Cluny. The works at Bassano comprise a very large earth-filled dam and concrete spillway, which were completed in 1913. This system is to serve the Eastern Section of the Company's Irrigation block, which extends east from Bassano. In all, it is proposed to irrigate about 625,000 acres of land.

The Southern Alberta Land Company has a dam and reservoir near Namaka. These works were practically completed in 1913. It is proposed to irrigate by this system about 200,000 acres.

There are many favourable sites for power development on the Bow River, but only one company has, up to the present, developed power. The Calgary Power Company has two plants; one is at Kananaskis Falls, at the confluence of the Kananaskis and Bow Rivers, near Seebe station; the other at Horseshoe Falls, two miles below. The latter plant has been in operation for some years and has a capacity of 19,500 horse power. The dam at Kananaskis Falls was completed in 1913 and this plant has a rated capacity of 11,600 horse power. Nearly all the power developed is used by the city of Calgary.

The city of Calgary obtains its domestic water supply from the Elbow River. The intake is about twelve miles southwest of Calgary, above which point the course of the river is through a wild and unsettled country, where there is no possibility of human contamination.

The town of Bassano obtains its domestic water supply from the Bow River at the Canadian Pacific Railway Company's dam three miles southwest of the townsite.

A special report upon the floods in this drainage basin is given in Appendix No. 4 of this report.

### BATH CREEK NEAR LAKE LOUISE.

*Location.*—On the NE. ¼ Sec. 32, Tp. 28, Rge. 16, W. 5th Mer., and one and one-quarter miles west of Lake Louise station, near the mouth of the stream.

*Records available.*—May 25 to September 20, 1913. Discharge measurements only in 1914. May 23 to December 31, 1915.

*Gauge.*—Vertical staff. Elevation of zero maintained at 89.59 feet during 1913. Elevation of zero maintained at 90.54 feet during 1914–15.

*Bench-mark.*—Downstream corner of right concrete abutment. Assumed elevation, 100.00 feet.

*Channel.*—Gravel shifting.

*Discharge measurements.*—Made by wading.

*Observer.*—Alex. Johnston, May 23 to July 7; D. Prescott, July 8 to December 31.

Bow River in flood at Calgary, on June 18, 1897. Looking west from a point on right bank of river near Langevin bridge. This photograph was given to us by Mr. Tom Birnie, who lived in Calgary at the time the flood occurred.



Bow River in flood at Calgary, on June 18, 1897,—looking east. Note the Langevin bridge on left. The white house beside the feed stable is still unmoved. It is No. 410 on 4th St, East. Mr. Tom Birnie, who lived in this house at the time of the flood, gave us this photograph. The water was within an inch of the window sill or this occasion. The feed stable, since this photograph was taken, has been moved across the street.

DISCHARGE MEASUREMENTS of Bath Creek near Lake Louise, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 12 | H. C. Ritchie | 26.0 | 12.6 | 0.96 | 0.95 | 12.0 |
| Jan. 29 | do | 26.0 | 12.3 | 0.95 | 0.92 | 11.6 |
| Feb. 9 | do | 26.2 | 11.5 | 0.98 | 0.90 | 11.3 |
| Feb. 23 | do | 26.2 | 11.5 | 0.96 | 0.88 | 11.1 |
| Mar. 9 | do | 27.0 | 11.7 | 0.83 | 0.85 | 9.7 |
| Mar. 23 | do | 27.0 | 12.9 | 0.97 | 1.05 | 12.4 |
| April 6 | do | 27.8 | 14.5 | 1.19 | 1.05 | 17.2 |
| April 22 | O. H. Hoover | 28.5 | 15.7 | 1.40 | 1.18 | 22.0 |
| May 14 | H. C. Ritchie | 29.8 | 24.6 | 2.20 | 1.57 | 54.0 |
| May 27 | do | 31.0 | 25.6 | 2.25 | 1.61 | 57.0 |
| June 10 | do | 31.5 | 27.0 | 2.48 | 1.68 | 67.0 |
| June 23 | do | 41.5 | 44.7 | 3.90 | 2.14 | 174.0 |
| July 20 | do | 43.0 | 55.1 | 4.34 | 2.32 | 239.0 |
| Aug. 10 | do | 44.0 | 61.9 | 4.42 | 2.58 | 273.0 |
| Sept. 2 | do | 41.5 | 47.4 | 3.68 | 2.20 | 174.0 |
| Sept. 30 | do | 29.2 | 24.8 | 2.00 | 1.53 | 50.0 |
| Oct. 21 | do | 28.0 | 20.4 | 1.48 | 1.32 | 30.0 |
| Nov. 3 | do | 28.0 | 20.7 | 1.54 | 1.30 | 32.0 |
| Nov. 17 | J. E. Caughey | 26.0 | 16.4 | 1.36 | 1.20 | 22.0 |
| Dec. 3 | do | 27.0 | 18.9 | 1.13 | 1.13 | 21.0 |
| Dec. 15 | H. C. Ritchie | 27.0 | 14.3 | 1.15 | 1.12 | 16.0 |

DAILY GAUGE HEIGHT AND DISCHARGE of Bath Creek near Lake Louise, for 1915.

| Day. | May. | | June. | | July. | | August. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | | | 1.68 | 66 | 2.38 | 235 | 2.60 | 310 |
| 2 | | | 1.70 | 69 | 2.36 | 228 | 2.70 | 345 |
| 3 | | | 1.67 | 65 | 2.30 | 209 | 2.67 | 334 |
| 4 | | | 1.69 | 68 | 2.40 | 241 | 2.70 | 345 |
| 5 | | | 1.70 | 69 | 2.50 | 275 | 2.72 | 352 |
| 6 | | | 1.68 | 66 | 2.58 | 303 | 2.75 | 363 |
| 7 | | | 1.67 | 65 | 2.60 | 310 | 2.77 | 369 |
| 8 | | | 1.70 | 69*a* | 2.60 | 310 | 2.77 | 369 |
| 9 | | | 1.68 | 66 | 2.46 | 261 | 2.78 | 373 |
| 10 | | | 1.64 | 61 | 2.34 | 222 | 2.75 | 363 |
| 11 | | | 1.60 | 56 | 2.20 | 179 | 2.70 | 345 |
| 12 | | | 1.58 | 54 | 2.20 | 179 | 2.65 | 328 |
| 13 | | | 1.60 | 56 | 2.18 | 173 | 2.67 | 334 |
| 14 | | | 1.72 | 72*a* | 2.16 | 167 | 2.70 | 345 |
| 15 | | | 1.76 | 79 | 2.15 | 164 | 2.70 | 345 |
| 16 | | | 1.90 | 103 | 2.15 | 164 | 2.60 | 310 |
| 17 | | | 2.12 | 156 | 2.15 | 164 | 2.62 | 317 |
| 18 | | | 2.10 | 150 | 2.20 | 179 | 2.60 | 310 |
| 19 | | | 2.12 | 156 | 2.25 | 194 | 2.55 | 293 |
| 20 | | | 1.98 | 121 | 2.30 | 209 | 2.50 | 275 |
| 21 | | | 1.92 | 107 | 2.45 | 258 | 2.60 | 310 |
| 22 | | | 1.94 | 112 | 2.55 | 293 | 2.62 | 317 |
| 23 | 1.50 | 45 | 1.98 | 121 | 2.55 | 293 | 2.65 | 328 |
| 24 | 1.60 | 56 | 1.94 | 112 | 2.50 | 275 | 2.63 | 320 |
| 25 | 1.70 | 69 | 2.20 | 179 | 2.35 | 223 | 2.57 | 299 |
| 26 | 1.60 | 56 | 2.90 | 413 | 2.30 | 209 | 2.55 | 293 |
| 27 | 1.59 | 55 | 2.84 | 394 | 2.33 | 219 | 2.60 | 310 |
| 28 | 1.61 | 57 | 2.30 | 209 | 2.50 | 275 | 2.55 | 293 |
| 29 | 1.70 | 69 | 2.46 | 261 | 2.55 | 293 | 2.63 | 320 |
| 30 | 1.60 | 56 | 2.40 | 241 | 2.60 | 310 | 2.50 | 275 |
| 31 | 1.58 | 54 | | | 2.63 | 320 | 2.40 | 241 |

*a* to *a* Gauge heights interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of Bath Creek near Lake Louise, for 1915.—*Concluded.*

| Day. | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.35 | 225 | 1.58 | 54 | 1.27 | 27 | 1.11 | 18 |
| 2 | 2.20 | 179 | 1.53 | 48 | 1.30 | 29 | 1.10 | 18 |
| 3 | 2.35 | 225 | 1.53 | 48 | 1.27 | 27 | 1.12 | 19 |
| 4 | 2.37 | 231 | 1.50 | 45 | 1.27 | 27 | 1.12 | 19 |
| 5 | 2.15 | 164 | 1.48 | 43 | 1.25 | 26 | 1.10 | 18 |
| 6 | 2.15 | 164 | 1.46 | 41 | 1.30 | 29 | 1.10 | 18 |
| 7 | 2.00 | 125 | 1.45 | 40 | 1.25 | 26 | 1.09 | 18 |
| 8 | 1.97 | 118 | 1.45 | 40 | 1.24 | 25 | 1.09 | 18 |
| 9 | 1.95 | 114 | 1.43 | 39 | 1.24 | 25 | 1.12 | 19 |
| 10 | 1.92 | 107 | 1.42 | 38 | 1.20 | 23 | 1.12 | 19 |
| 11 | 1.90 | 103 | 1.40 | 36 | 1.23 | 25 | 1.10 | 18 |
| 12 | 1.87 | 99 | 1.40 | 36 | 1.19 | 22 | 1.10 | 18 |
| 13 | 1.75 | 77 | 1.37 | 34 | 1.20 | 23 | 1.10 | 18 |
| 14 | 1.73 | 74 | 1.35 | 33 | 1.20 | 23 | 1.10 | 18 |
| 15 | 1.70 | 69 | 1.35 | 33 | 1.20 | 23 | 1.00 | 14 |
| 16 | 1.70 | 69 | 1.35 | 33 | 1.20 | 23 | 1.10 | 18 |
| 17 | 1.68 | 66 | 1.35 | 33 | 1.22 | 24 | 1.10 | 18 |
| 18 | 1.60 | 56 | 1.37 | 34 | 1.20 | 23 | 1.10 | 18 |
| 19 | 1.70 | 69 | 1.35 | 33 | 1.20 | 23 | 1.10 | 18 |
| 20 | 1.75 | 77 | 1.35 | 33 | 1.20 | 23 | 1.10 | 18 |
| 21 | 1.73 | 74 | 1.31 | 30 | 1.18 | 22 | 1.10 | 18 |
| 22 | 1.65 | 62 | 1.30 | 29 | 1.20 | 23 | 1.10 | 18 |
| 23 | 1.59 | 55 | 1.30 | 29 | 1.20 | 23 | 1.10 | 18 |
| 24 | 1.59 | 55 | 1.32 | 30 | 1.20 | 23 | 1.10 | 18 |
| 25 | 1.55 | 51 | 1.30 | 29 | 1.20 | 23 | 1.10 | 18 |
| 26 | 1.53 | 48 | 1.33 | 31 | 1.19 | 22 | 1.10 | 18 |
| 27 | 1.53 | 48 | 1.30 | 29 | 1.15 | 20 | 1.10 | 18 |
| 28 | 1.52 | 47 | 1.30 | 29 | 1.10 | 18 | 1.09 | 18 |
| 29 | 1.52 | 47 | 1.30 | 29 | 1.10 | 18 | 1.09 | 18 |
| 30 | 1.53 | 48 | 1.27 | 27 | 1.13 | 20 | 1.05 | 16 |
| 31 | ..... | ..... | 1.26 | 27 | ..... | ..... | 1.05 | 16 |

MONTHLY DISCHARGE of Bath Creek near Lake Louise, for 1915.

(Drainage area 30 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| May (23 to 31) | 69 | 45 | 57 | 1.900 | 0.64 | 1,025 |
| June | 415 | 54 | 127 | 4.233 | 4.72 | 7,557 |
| July | 320 | 164 | 237 | 7.900 | 9.11 | 14,573 |
| August | 373 | 241 | 323 | 1.077 | 1.24 | 19,860 |
| September | 231 | 47 | 98 | 3.267 | 3.64 | 5,831 |
| October | 54 | 27 | 35 | 1.167 | 1.34 | 2,152 |
| November | 29 | 18 | 24 | 0.800 | 0.89 | 1,428 |
| December | 19 | 14 | 18 | 0.600 | 0.69 | 1,107 |
| The period | ..... | ..... | ..... | ..... | 22.27 | 53,533 |

BOW RIVER AT LAKE LOUISE.

*Location.*—On the SE. ¼ Sec. 28, Tp. 28, Rge. 16, W. 5th Mer., one-half mile east of Lake Louise station, at the junction of the Bow and Pipestone Rivers.

*Records available.*—January 1, 1911, to December 31, 1915. In 1910 discharge measurements only.

*Gauge.*—Chain. Elevation of zero maintained at 4,931.72 feet since establishment. Previous to September 1, 1911, gauge at old station was used.

*Bench-mark.*—Permanent iron bench-mark on the left bank. Elevation, 4,942.82 feet above mean sea level. (Canadian Pacific Railway datum.)

*Channel.*—Permanent.

*Discharge measurements.*—Made from a cable or by wading.

*Floods.*—During the latter part of June, 1915, stream was in flood. The highest gauge height recorded was 9.54 feet on June 26, 1915. Stream did not overflow banks.

*Observer.*—E. Braund.

DISCHARGE MEASUREMENTS of Bow River at Lake Louise, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 12 | H. C. Ritchie | 50.0 | 42.2 | 1.34 | 5.43 | 56.5 |
| Jan. 29 | do | 50.0 | 40.1 | 1.05 | 4.95 | 42.1 |
| Feb. 9 | do | 50.0 | 42.0 | 1.14 | 5.19 | 48.6 |
| Feb. 23 | do | 50.0 | 37.6 | 1.12 | 5.51 | 42.1 |
| Mar. 9 | do | 50.0 | 33.0 | 1.24 | 5.36 | 41.0 |
| Mar. 23 | do | 43.5 | 29.2 | 1.44 | 4.27 | 42.0 |
| April 6 | do | 43.5 | 40.8 | 1.78 | 4.50 | 72.0 |
| April 20 | O. H. Hoover | 55.5 | 98.4 | 2.69 | 5.81 | 265.0 |
| May 13 | H. C. Rtchie | 69.0 | 138.7 | 3.54 | 6.4[illegible] | 4[illegible] |
| May 26 | do | 67.0 | 134.5 | 3.19 | 6.30 | 4[illegible] |
| June 9 | do | 68.0 | 139.3 | 3.41 | 6.36 | 475.0 |
| June 23 | do | 72.0 | 183.1 | 3.76 | 6.99 | 6[illegible] |
| July 20 | do | 74.0 | 231.6 | 4.34 | 7.46 | 1,014.0 |
| Aug. 18 | do | 74.0 | 269.9 | 5.36 | 7.92 | 1,445.0 |
| Sept. 1 | do | 73.5 | 222.0 | 4.60 | 7.23 | 1,022.0 |
| Sept. 30 | do | 58.0 | 95.8 | 1.92 | 5.42 | 184.0 |
| Oct. 20 | do | 51.0 | 80.2 | 1.76 | 5.14 | 141.0 |
| Nov. 2 | do | 49.0 | 74.5 | 1.95 | 5.15 | 145.0 |
| Nov. 17 | J. E. Caughey | 45.0 | 66.3 | 1.34 | 5.23 | 89.0 |
| Dec. 3 | do | 43.0 | 84.4 | 1.32 | 6.23 | 111.0 |
| Dec. 15 | H. C. Ritchie | 54.0 | 52.0 | 1.75 | 7.15 | [illegible] |

Ice conditions Jan. 1 to Mar. 22.
Ice conditions Nov. 17 to Dec. 31.

DAILY GAUGE HEIGHT AND DISCHARGE of Bow River at Lake Louise, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge | Gauge Height. | Discharge. | Gauge Height. | Discharge | Gauge Height. | Discharge | Gauge Height. | Discharge | Gauge Height. | Discharge |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet* | *Sec.-ft.* |
| 1 | ....*a* | 60 | 4.81 | 47 | 5.17 | 40 | 4.20 | 44 | 5.80 | 278 | 6.36 | 430 |
| 2 | ..... | 61 | 4.87 | 47 | 5.36 | 41 | 4.26 | 49 | 5.74 | 264 | 6.35 | 447 |
| 3 | ... | 60 | 4.93 | 47*a* | 5.24 | 42 | 4.54 | 74 | 5.68 | 250 | 6.24 | 41[illegible] |
| 4 | ... | 57 | 4.94 | 48*a* | 5.08 | 41 | 4.53 | 73 | 5.65 | 243 | 6.27 | 42[illegible] |
| 5 | ... | 55 | 5.03 | 48 | 5.04 | 40 | 4.42 | 62 | 5.63 | 239 | 6.[illegible] | 4[illegible] |
| 6 | ... | 55 | 4.84 | 48 | 5.27 | 41 | 4.46 | 66 | 5.68 | 250 | 6.34 | 444 |
| 7 | ... | 56 | 4.95 | 48 | 5.31 | 41 | 4.54 | 74 | 5.82 | 287 | 6.51 | [illegible] |
| 8 | ... | 57 | 4.76 | 49 | 5.29 | 41 | 4.54 | 74 | 6.19 | 393 | [illegible] | [illegible] |
| 9 | ... | 57 | 4.88 | 49 | 5.34 | 41 | 4.45 | 65 | 6.54 | 51[illegible] | 6.26 | 4[illegible] |
| 10 | ...*b* | 57 | 5.24 | 49 | 5.34 | 41 | 4.36 | 57 | 6.68 | 57[illegible] | 6.25 | 41[illegible] |
| 11 | 5.24 | 57 | 5.20 | 49 | 4.85 | 41 | 4.47 | 67 | 6.65 | 566 | 6.14 | [illegible] |
| 12 | 5.43 | 56 | 5.19 | 48 | 4.41 | 41 | 4.51 | 71 | 6.46 | 487 | 6.10 | [illegible] |
| 13 | 5.25 | 51 | 5.20 | 46 | 4.45 | 41 | 4.75 | 96 | 6.40 | 464 | [illegible].24 | 41[illegible] |
| 14 | 5.31 | 50 | 5.66 | 42 | 4.72 | 41 | 4.81 | 104 | 6.24 | 41[illegible] | 6.55 | 447 |
| 15 | 5.16 | 50 | 5.77 | 44 | 4.63 | 41 | 4.94 | 120 | 6.10 | [illegible] | [illegible] | [illegible] |
| 16 | 5.13 | 51 | 5.67 | 46 | 4.23 | 41 | 5.06 | 137 | 5.96 | 321 | 6.74 | [illegible] |
| 17 | 5.17 | 53 | 5.16 | 46 | 4.25 | 42 | 5.32 | 178 | 5.86 | 284 | 7.1[illegible] | 7[illegible] |
| 18 | 5.16 | 54 | 5.13 | 46 | 4.25 | 42 | 5.46 | 203 | 5.80 | 278 | 7.[illegible] | 74[illegible] |
| 19 | 5.05 | 53 | 5.71 | 46 | 4.23 | 42 | 5.60 | 242 | [illegible] | [illegible] | 6.85 | [illegible] |
| 20 | 5.05 | 48 | 5.21 | 45 | 4.19 | 42 | 5.84 | 280 | 5.72 | 2[illegible] | [illegible] | [illegible] |
| 21 | 4.84 | 43*a* | 5.30 | 42*a* | 4.20 | 44 | 5.64 | 241 | 5.81 | 281 | [illegible] | [illegible] |
| 22 | 5.03 | 44*a* | 5.41 | 42*a* | 4.25 | 49 | 5.50 | 244 | 6.00 | [illegible] | [illegible] | [illegible] |
| 23 | 5.05 | 41 | 5.51 | 42 | 4.27 | 50 | 5.45 | 242 | [illegible].04 | 344 | [illegible] | [illegible] |
| 24 | 4.96 | 41 | 5.20 | 42 | 4.21 | 45 | 5.20 | 211 | [illegible] | [illegible] | [illegible] | 78[illegible] |
| 25 | 4.90 | 40 | 5.31 | 43 | 4.30 | 52 | 5.47 | 2[illegible] | [illegible].24 | 410 | [illegible] | 1,1[illegible] |
| 26 | 4.83 | 40 | 5.07 | 42 | 4.34 | 55 | 5.46 | 2[illegible] | [illegible] | 4[illegible] | [illegible] | [illegible] |
| 27 | 4.81 | 40 | 4.96 | 42 | 4.50 | 70 | 5.44 | [illegible] | [illegible] | 3[illegible] | [illegible] | [illegible] |
| 28 | 4.80 | 41 | 5.37 | 41 | 4.45 | 65 | [illegible] | 18[illegible] | [illegible] | [illegible] | [illegible] | 1,5[illegible] |
| 29 | 4.75 | 42 | | | 4.32 | 54 | 5.51 | [illegible] | [illegible] | 448 | [illegible] | [illegible] |
| 30 | 4.76 | 45 | | | 4.18 | 42 | 5.66 | [illegible] | [illegible] | [illegible] | [illegible] | 1,44[illegible] |
| 31 | 4.85 | 46 | | | 4.24 | 46 | | | [illegible].18 | [illegible] | | |

*a* to *b* Gauge heights frozen to bottom.
*a* Gauge heights interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of Bow River at Lake Louise, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 8.05 | 1,529 | 7.64 | 1,160 | 7.23 | 1,012 | 5.64 | 241 | 5.18 | 155 | 5.79 | 106 |
| 2 | 7.73 | 1,236 | 7.75 | 1,254 | 7.13 | 960 | 5.57 | 226 | 5.16 | 152 | 6.03 | 110 |
| 3 | 7.60 | 1,126 | 7.88 | 1,368 | 7.04 | 920 | 5.52 | 215 | 5.16 | 152 | 6.23 | 111 |
| 4 | 7.64 | 1,160 | 7.90 | 1,386 | 7.05 | 932 | 5.43 | 198 | 5.12 | 146 | 6.21 | 110 |
| 5 | 7.76 | 1,262 | 7.68 | 1,193 | 6.98 | 900 | 5.46 | 203 | 5.06 | 137 | 6.18 | 110 |
| 6 | 7.84 | 1,333 | 7.63 | 1,151 | 6.91 | 868 | 5.37 | 187 | 4.89 | 113 | 6.27 | 109 |
| 7 | 7.92 | 1,405 | 7.64 | 1,160 | 6.72 | 760 | 5.27 | 170 | 5.01 | 130 | 6.47 | 106 |
| 8 | 7.86 | 1,350 | 7.64 | 1,160 | 6.53 | 672 | 5.27 | 170 | 5.04 | 134 | 6.39 | 102 |
| 9 | 7.74 | 1,245 | 7.64 | 1,160 | 6.37 | 608 | 5.22 | 161 | 4.95 | 121 | 6.77 | 99 |
| 10 | 7.55 | 1,088 | 7.63 | 1,151 | 6.17 | 520 | 5.16 | 132 | 4.84 | 107 | 7.11 | 97 |
| 11 | 7.28 | 902 | 7.57 | 1,103 | 6.03 | 468 | 5.12 | 146 | 4.71 | 91 | 7.39 | 95 |
| 12 | 7.05 | 763 | 7.57 | 1,103 | 5.92 | 432 | 5.12 | 146 | 4.67 | 87 | 7.48 | 93 |
| 13 | 6.95 | 708 | 7.54 | 1,080 | 5.83 | 404 | 5.09 | 142 | 4.66 | 86 | 7.39 | 92 |
| 14 | 7.45 | 1,015 | 7.62 | 1,143 | 5.74 | 376 | 5.10 | 143 | 4.90 | 89 | 7.32 | 91 |
| 15 | 7.35 | 947 | 7.64 | 1,160 | 5.66 | 348 | 5.03 | 132 | 5.11 | 89 | 7.15 | 91 |
| 16 | 7.55 | 1,088 | 7.67 | 1,185 | 5.68 | 356 | 5.02 | 131 | 5.21 | 89 | 6.85 | 90 |
| 17 | 7.55 | 1,088 | 7.64 | 1,160 | 5.60 | 332 | 5.00 | 128 | 5.23 | 89 | 6.70 | 89 |
| 18 | 7.45 | 1,015 | 7.75*a* | 1,264 | 5.54 | 316 | 5.07 | 138 | 5.24 | 89 | 6.68 | 90 |
| 19 | 7.45 | 1,015 | 7.63 | 1,176 | 5.75 | 376 | 5.14 | 149 | 5.24 | 89 | 6.57 | 88 |
| 20 | 7.43 | 1,001 | 8.43 | 1,736 | 5.64 | 340 | 5.16 | 152 | 5.24 | 88 | 6.34 | 87 |
| 21 | 7.54 | 1,080 | 7.84 | 1,400 | 5.56 | 312 | 5.16 | 152 | 5.13 | 89 | 6.22 | 86 |
| 22 | 7.73 | 1,236 | 7.75 | 1,324 | 5.54 | 304 | 5.16 | 152 | 5.25 | 90 | 6.08 | 85 |
| 23 | 7.61 | 1,134 | 7.70 | 1,296 | 5.63 | 320 | 5.08 | 140 | 5.24 | 91 | 6.01 | 84 |
| 24 | 7.44 | 1,008 | 7.74 | 1,360 | 5.58 | 304 | 5.08 | 140 | 5.16 | 92 | 5.75 | 84 |
| 25 | 7.45 | 1,015 | 7.63 | 1,260 | 5.51 | 272 | 5.07 | 138 | 5.15 | 93 | 5.65 | 84 |
| 26 | 7.48 | 1,036 | 7.54 | 1,200 | 5.46 | 252 | 5.04 | 134 | 5.05 | 95 | 5.80 | 83 |
| 27 | 7.33 | 935 | 7.52 | 1,192 | 5.46 | 240 | 5.23 | 163 | 5.05 | 96 | 5.94 | 83 |
| 28 | 7.74 | 1,245 | 7.44 | 1,140 | 5.42 | 220 | 5.36 | 185 | 5.06 | 99 | 5.88 | 82 |
| 29 | 7.53 | 1,073 | 7.44 | 1,152 | 5.37 | 192 | 5.27 | 170 | 5.29 | 101 | 5.77 | 81 |
| 30 | 7.59 | 1,118 | 7.46 | 1,176 | 5.42*a* | 184 | 5.26 | 168 | 5.66 | 103 | 5.90 | 81 |
| 31 | 7.64 | 1,160 | 7.44 | 1,168 | ..... | ..... | 5.22 | 161 | ..... | ..... | 5.98 | 80 |

*a–a* Aug. 18 to Sept. 30 Bolster method.
Ice conditions Jan. 1 to Mar. 22.
Ice conditions Nov. 17 to Dec. 31.

MONTHLY DISCHARGE of Bow River at Lake Louise, for 1915.

(Drainage area 165 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 61 | 40 | 50 | 0.303 | 0.35 | 3,074 |
| February | 49 | 41 | 46 | 0.279 | 0.29 | 2,555 |
| March | 70 | 40 | 45 | 0.273 | 0.32 | 2,767 |
| April | 319 | 44 | 144 | 0.873 | 0.97 | 8,569 |
| May | 579 | 239 | 355 | 2.150 | 2.48 | 21,828 |
| June | 2,985 | 363 | 796 | 4.820 | 5.38 | 47,365 |
| July | 1,529 | 708 | 1,107 | 6.710 | 7.74 | 68,070 |
| August | 1,736 | 1,080 | 1,223 | 7.410 | 8.54 | 75,200 |
| September | 1,012 | 184 | 483 | 2.930 | 3.27 | 28,740 |
| October | 241 | 128 | 162 | 0.983 | 1.13 | 9,961 |
| November | 155 | 86 | 106 | 0.642 | 0.72 | 6,307 |
| December | 111 | 80 | 93 | 0.564 | 0.65 | 5,718 |
| The year | ..... | ..... | ..... | ..... | 31.84 | 280,154 |

PIPESTONE RIVER AT LAKE LOUISE.

*Location.*—On the SW. ¼ Sec. 27, Tp. 28, Rge. 16, W. 5th Mer., one-half mile east of Lake Louise station at the junction of the Bow and Pipestone Rivers.

*Records available.*—September 1, 1911, to October 31, 1911; January 1, 1912, to December 31, 1915.

*Gauge.*—Chain. Elevation of zero maintained at 4,985.04 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark on left bank. Elevation, 4,993.73 feet above mean sea level. (Canadian Pacific Railway datum.)

*Channel.*—Small boulders and gravel. High water may shift some boulders at times.

*Discharge measurements.*—Made from a cable or by wading.

*Floods.*—Stream was in flood during June, 1915. Maximum gauge height, 7.47 feet. Stream did not overflow banks.

*Observer.*—E. Braund.

DISCHARGE MEASUREMENTS of Pipestone River at Lake Louise, in 1915.

| Date. | Engineer. | Width. | Area of Section | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 11 | H. C. Ritchie | 41.0 | 37.6 | 1.26 | 4.88 | 47.4 |
| Jan. 26 | do | 40.0 | 29.4 | 0.95 | 4.42 | 28.0 |
| Feb. 8 | do | 35.0 | 25.8 | 1.12 | 4.70 | 28.8 |
| Feb. 23 | do | 35.0 | 28.0 | 1.13 | 4.18 | 24.7 |
| Mar. 9 | do | 35.0 | 55.5 | 0.56 | 4.75 | 31.0 |
| Mar. 23 | do | 40.0 | 32.4 | 1.03 | 4.00 | 34.0 |
| April 6 | do | 41.5 | 30.2 | 0.97 | 3.94 | 30.0 |
| April 20 | O. H. Hoover | 64.5 | 85.7 | 2.78 | 4.92 | 238.0 |
| May 13 | H. C. Ritchie | 73.0 | 101.0 | 3.06 | 5.15 | 309.0 |
| May 26 | do | 73.5 | 106.9 | 3.19 | 5.18 | 341.0 |
| June 9 | do | 73.5 | 103.2 | 3.20 | 5.20 | 331.0 |
| June 23 | do | 75.0 | 132.0 | 4.09 | 5.59 | 540.0 |
| July 20 | do | 76.5 | 144.4 | 4.35 | 5.84 | 628.0 |
| Aug. 19 | do | 75.0 | 121.2 | 4.24 | 5.67 | 514.0 |
| Sept. 1 | do | 73.5 | 97.2 | 3.10 | 5.24 | 301.0 |
| Sept. 30 | do | 61.5 | 62.4 | 2.05 | 4.61 | 128.0 |
| Oct. 20 | do | 58.5 | 56.8 | 1.87 | 4.55 | 106.0 |
| Nov. 2 | do | 56.0 | 45.4 | 1.66 | 4.41 | 75.0 |
| Nov. 17 | J. E. Caughey | 67.0 | 88.3 | 0.80 | 5.71 | 71.0 |
| Dec. 4 | do | 68.0 | 98.6 | 0.43 | 6.05 | 42.0 |

DAILY GAUGE HEIGHT AND DISCHARGE of Pipestone River near Lake Louise, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 5.72 | 47*a* | 4.38 | 26 | 4.06 | 28 | 3.90 | 26 | 4.82 | 183 | 5.23 | 325 |
| 2 | 5.69 | 47 | 4.39 | 27 | 4.08 | 28 | 3.96 | 31 | 4.74 | 161 | 5.21 | 317 |
| 3 | 5.69 | 47 | 4.33 | 28 | 4.12 | 29 | 4.15 | 51 | 4.69 | 149 | 5.10 | 274 |
| 4 | 5.54 | 46 | 4.33 | 29 | 4.10 | 30*a* | 4.15 | 51 | 4.67 | 144 | 5.14 | 290 |
| 5 | 5.42 | 44 | 4.29 | 30 | 4.03 | 38 | 4.11 | 46 | 4.67 | 144 | 5.25 | 333 |
| 6 | 5.23 | 43 | 4.36 | 32 | 4.03 | 38 | 3.94 | 30 | 4.72 | 156 | 5.18 | 305 |
| 7 | 5.14 | 45 | 4.72 | 33 | 4.01 | 36 | 4.07 | 42 | 4.88 | 199 | 5.32 | 363 |
| 8 | 5.13 | 46 | 4.60 | 29 | 4.02 | 37 | 4.13 | 49 | 5.28 | 346 | 5.34 | 372 |
| 9 | 5.13 | 47 | 4.53 | 27 | 4.02 | 37 | 4.04 | 39 | 5.47 | 433 | 5.20 | 313 |
| 10 | 5.12 | 48 | 4.40 | 26 | 4.03 | 38 | 3.91 | 27 | 5.56 | 479 | 5.12 | 282 |
| 11 | 4.92 | 48 | 4.34 | 25 | 4.01 | 36 | 4.07 | 42 | 5.53 | 464 | 4.99 | 233 |
| 12 | 4.83 | 49 | 4.32 | 25 | 3.98 | 33 | 4.17 | 53 | 5.16 | 297 | 4.99 | 233 |
| 13 | 4.72 | 49 | 4.28 | 25 | 3.98 | 33 | 4.28 | 68 | 5.15 | 294 | 5.11 | 278 |
| 14 | 4.63 | 50 | 4.38 | 25 | 4.01 | 36 | 4.31 | 73 | 5.00 | 238 | 5.18 | 305 |
| 15 | 4.62 | 50 | 4.34 | 25 | 4.02 | 37 | 4.38 | 84 | 4.89 | 202 | 5.34 | 372 |
| 16 | 4.56 | 51 | 4.31 | 26 | 3.97 | 32 | 4.52 | 109 | 4.80 | 177 | 5.47 | 433 |
| 17 | 4.58 | 52 | 4.15 | 27 | 3.97 | 32 | 4.63 | 134 | 4.77 | 169 | 5.69 | 547 |
| 18 | 4.53 | 52 | 4.13 | 28 | 3.99 | 34 | 4.72 | 156 | 4.74 | 161 | 5.60 | 500 |
| 19 | 4.49 | 52 | 4.16 | 28 | 3.97 | 32 | 4.81 | 180 | 4.70 | 151 | 5.40 | 399 |
| 20 | 4.43 | 52 | 4.14 | 26 | 3.94 | 30 | 4.86 | 194 | 4.72 | 156 | 5.38 | 390 |
| 21 | 4.29 | 49 | 4.25 | 25 | 3.94 | 30 | 4.68 | 146 | 4.85 | 191 | 5.32 | 363 |
| 22 | 4.43 | 42 | 4.22 | 25 | 3.98 | 33 | 4.56 | 118 | 5.04 | 252 | 5.40 | 399 |
| 23 | 4.43 | 36 | 4.18 | 25 | 4.01 | 36 | 4.53 | 112 | 5.01 | 242 | 5.56 | 479 |
| 24 | 4.43 | 32 | 4.22 | 25 | 3.95 | 30 | 4.58 | 123 | 5.12 | 282 | 5.60 | 500 |
| 25 | 4.42 | 30 | 4.22 | 26 | 3.92 | 28 | 4.57 | 120 | 5.15 | 294 | 5.93 | 678 |
| 26 | 4.43 | 28 | 4.26 | 26 | 3.89 | 25 | 4.57 | 120 | 5.18 | 305 | 7.47 | 1,568 |
| 27 | 4.39 | 26 | 4.20 | 27 | 4.20 | 57 | 4.56 | 118 | 5.06 | 260 | 6.57 | 1,046 |
| 28 | 4.34 | 25 | 4.14 | 27 | 3.99 | 34 | 4.47 | 100 | 4.96 | 225 | 6.23 | 848 |
| 29 | 4.34 | 26 | ... | ... | 3.93 | 29 | 4.59 | 125 | 4.98 | 231 | 6.10 | 774 |
| 30 | 4.34 | 26 | ... | ... | 3.99 | 34 | 5.06 | 260 | 4.96 | 225 | 6.04 | 740 |
| 31 | 4.34 | 26 | ... | ... | 3.99 | 34 | ... | ... | 5.03 | 249 | ... | ... |

*a–a* Ice conditions Jan. 1 to March 4.

DAILY GAUGE HEIGHT AND DISCHARGE of Pipestone River near Lake Louise, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 6.10 | 774 | 5.65 | 526 | 5.24 | 329 | 4.78 | 172 | 4.51 | 107 | 6.14 | 48 |
| 2 | 5.86 | 639 | 5.74 | 574 | 5.21 | 317 | 4.71 | 154 | 4.41 | 89 | 6.12 | 46 |
| 3 | 5.80 | 606 | 5.75 | 579 | 5.11 | 278 | 4.69 | 149 | 4.42 | 91 | 6.12 | 44 |
| 4 | 5.80 | 606 | 5.75 | 579 | 5.11 | 278 | 4.62 | 132 | 4.44 | 94 | 6.08 | 42 |
| 5 | 5.90 | 661 | 5.59 | 495 | 5.10 | 274 | 4.64 | 137 | 4.44 | 94 | 5.90 | 40 |
| 6 | 5.90 | 661 | 5.54 | 469 | 5.07 | 263 | 4.60 | 127 | 4.22 | 60 | 5.95 | 39 |
| 7 | 5.91 | 667 | 5.54 | 469 | 5.04 | 252 | 4.51 | 107 | 4.25 | 64 | 5.84 | 38 |
| 8 | 5.85 | 634 | 5.58 | 490 | 4.98 | 231 | 4.61 | 129 | 4.30 | 71 | 5.80 | 37 |
| 9 | 5.80 | 606 | 5.53 | 464 | 4.91 | 208 | 4.56 | 118 | 4.44 | 94 | 5.67 | 37 |
| 10 | 5.62 | 510 | 5.53 | 464 | 4.86 | 194 | 4.53 | 112 | 4.29 | 70 | 5.50 | 36 |
| 11 | 5.51 | 453 | 5.49 | 443 | 4.79 | 174 | 4.50 | 105 | 4.23 | 61 | 5.89 | 35 |
| 12 | 5.33 | 368 | 5.51 | 453 | 4.76 | 167 | 4.50 | 105 | 4.36 | 84 | 5.94 | 34 |
| 13 | 5.32 | 363 | 5.47 | 433 | 4.71 | 154 | 4.50 | 105 | 4.40 | 87 | 5.84 | 34 |
| 14 | 5.74 | 574 | 5.50 | 448 | 4.71 | 154 | 4.52 | 109 | 5.00*a* | 76 | 5.86 | 33 |
| 15 | 5.58 | 490 | 5.51 | 453 | 4.70 | 151 | 4.47 | 100 | 5.40 | 74 | 5.75 | 33 |
| 16 | 5.75 | 579 | 5.53 | 464 | 4.70 | 151 | 4.47 | 100 | 5.58 | 72 | 5.66 | 32 |
| 17 | 5.83 | 622 | 5.51 | 453 | 4.70 | 151 | 4.50 | 105 | 5.71 | 71 | 5.65 | 31 |
| 18 | 5.74 | 574 | 5.55 | 474 | 4.64 | 137 | 4.52 | 109 | 5.79 | 70 | 5.56 | 31 |
| 19 | 5.76 | 584 | 5.53 | 464 | 4.80 | 177 | 4.53 | 112 | 5.99 | 68 | 5.36 | 30 |
| 20 | 5.74 | 574 | 6.41 | 953 | 4.70 | 151 | 4.54 | 114 | 6.09 | 66 | 5.18 | 30 |
| 21 | 5.80 | 606 | 5.88 | 650 | 4.70 | 151 | 4.53 | 112 | 6.18 | 64 | 5.04 | 29 |
| 22 | 5.86 | 639 | 5.61 | 505 | 4.66 | 141 | 4.53 | 112 | 6.20 | 63 | 4.95 | 29 |
| 23 | 5.81 | 612 | 5.60 | 500 | 4.77 | 169 | 4.49 | 103 | 6.21 | 61 | 4.95 | 29 |
| 24 | 5.66 | 531 | 5.57 | 484 | 4.73 | 159 | 4.53 | 112 | 6.20 | 59 | 4.91 | 29 |
| 25 | 5.68 | 542 | 5.50 | 448 | 4.69 | 149 | 4.53 | 112 | 6.21 | 58 | 4.66 | 28 |
| 26 | 5.68 | 542 | 5.41 | 404 | 4.66 | 141 | 4.50 | 105 | 6.19 | 56 | 4.61 | 27 |
| 27 | 5.57 | 484 | 5.40 | 399 | 4.68 | 146 | 4.57 | 120 | 6.21 | 55 | 4.56 | 26 |
| 28 | 5.98 | 706 | 5.33 | 368 | 4.67 | 144 | 4.62 | 132 | 6.23 | 53 | 4.56 | 25 |
| 29 | 5.66 | 531 | 5.32 | 363 | 4.63 | 134 | 4.55 | 116 | 6.21 | 51 | 4.38 | 25 |
| 30 | 5.73 | 568 | 5.32 | 363 | 4.63 | 134 | 4.55 | 116 | 6.21 | 50 | 4.46 | 24 |
| 31 | 5.74 | 574 | 5.31 | 358 | ..... | ..... | 4.53 | 112 | ..... | ..... | 4.46 | 24*b* |

*a–b* Ice conditions.

MONTHLY DISCHARGE of Pipestone River near Lake Louise, for 1915.

(Drainage area 137 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 52 | 25 | 42 | 0.307 | 0.35 | 2,582 |
| February | 33 | 25 | 27 | 0.197 | 0.20 | 1,500 |
| March | 57 | 25 | 34 | 0.248 | 0.29 | 2,091 |
| April | 260 | 26 | 94 | 0.686 | 0.76 | 5,593 |
| May | 479 | 144 | 241 | 1.760 | 2.03 | 14,819 |
| June | 1,568 | 235 | 475 | 3.470 | 3.87 | 28,264 |
| July | 774 | 363 | 577 | 4.210 | 4.85 | 35,478 |
| August | 953 | 358 | 484 | 3.530 | 4.07 | 29,760 |
| September | 329 | 134 | 189 | 1.380 | 1.54 | 11,246 |
| October | 172 | 100 | 118 | 0.861 | 0.99 | 7,256 |
| November | 107 | 50 | 71 | 0.518 | 0.58 | 4,225 |
| December | 48 | 24 | 33 | 0.241 | 0.28 | 2,029 |
| The year | ..... | ..... | ..... | ..... | 19.81 | 144,843 |

LOUISE CREEK NEAR LAKE LOUISE.

*Location.*—On the NE. ¼ Sec. 20, Tp. 28, Rge. 16, W. 5th Mer., at the Chateau Lake Louise, 500 feet from the lake itself.

*Records available.*—July 11, 1913, to December 31, 1915.

*Gauge.*—Vertical staff. Zero elevation maintained at 93.72 feet to June 9, 1915, from establishment. Zero elevation maintained at 90.63 feet from June 9, 1915, to December 31, 1915.

*Bench-mark.*—Spikes in tree on left bank about 15 feet below gauge rod. Assumed elevation, 100.00 feet.

*Channel.*—Permanent.

*Discharge measurements.*—Made by wading.

*Diversions.*—The penstock of the Lake Louise power plant takes water from the lake, and this quantity must be added to the discharge of Louise Creek to obtain the total run-off from the lake.

*Floods.*—The stream reached highest gauge height August 16 from the warm weather in that locality. The flood period of June on the Louise Creek was not extensive.

*Observer.*—Stephen F. Toolsey, January 1 to 16; David Grieg, January 17 to May 15; David Smith, May 16 to November 15; J. Talerico, November 16 to December 31.

DISCHARGE MEASUREMENTS of Louise Creek near Lake Louise, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 11 | H. C. Ritchie | 10.8 | 4.59 | 1.46 | 4.05 | 6.68 |
| Jan. 28 | do | 8.6 | 2.97 | 0.89 | 3.92 | 2.65 |
| Feb. 8 | do | 8.4 | 2.82 | 0.63 | 3.89 | 1.79 |
| Feb. 24 | do | 8.0 | 2.80 | 0.56 | 3.88 | 1.62 |
| Mar. 10 | do | 8.0 | 2.80 | 0.56 | 3.87 | 1.57 |
| Mar. 24 | do | 7.0 | 2.35 | 0.66 | 3.87 | 1.54 |
| April 22 | O. H. Hoover | 10.3 | 3.50 | 1.43 | 4.00 | 5.00 |
| May 13 | H. C. Ritchie | 22.0 | 14.95 | 0.98 | 4.22 | 14.70 |
| May 26 | do | 12.0 | 5.00 | 2.03 | 4.14 | 10.20 |
| June 9 | do | 22.8 | 16.00 | 1.00 | 4.25 | 16.00 |
| June 23 | do | 22.0 | 20.20 | 1.67 | 4.45 | 34.00 |
| July 20 | do | 24.0 | 26.40 | 2.65 | 4.78 | 70.0[illegible] |
| Aug. 18 | do | 47.4 | 47.01 | 2.39 | 5.12 | 113.[illegible] |
| Sept. 2 | do | 47.0 | 32.30 | 2.39 | 4.80 | 77.00 |
| Oct. 1 | do | 4.5 | 1.15 | 0.97 | 3.85 | 1.11 |
| Oct. 20 | do | 11.0 | 3.90 | 1.76 | 4.05 | 6.9[illegible] |
| Nov. 2 | do | 11.0 | 3.90 | 1.74 | 4.05 | 6.8[illegible] |
| Nov. 18 | J. E. Caughey | 4.6 | 1.39 | 0.90 | 3.93 | 1.28 |
| Dec. 4 | do | 5.0 | 1.30 | 0.33 | 3.84 | [illegible].44 |
| Dec. 16 | H. C. Ritchie | | | | 3.[illegible] | [illegible].5[illegible] |

*a* Discharge estimated.
*b* Gauge height ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Louise Creek near Lake Louise, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 4.09 | 8.6 | 3.94 | 3.30 | 3.87 | 1.58 | 3.87 | 1.58 | 4.06 | 7.20 | 4.14 | 10.9 |
| 2 | 4.09 | 8.6 | 3.94 | 3.30 | 3.87 | 1.58 | 3.87 | 1.58 | 4.08 | 8.10 | 4.20 | 14.0 |
| 3 | 4.09 | 8.6 | 3.91 | 2.60 | 3.86 | 1.34 | 3.88 | 1.82 | 4.08 | 8.10 | 4.25 | 16.8 |
| 4 | 4.09 | 8.6 | 3.91 | 2.60 | 3.86 | 1.34 | 3.88 | 1.82 | 4.10 | 9.00 | 4.26 | 17.4 |
| 5 | 4.09 | 8.6 | 3.90 | 2.30 | 3.85 | 1.10 | 3.88 | 1.82 | 4.11 | 9.50 | 4.26 | 17.4 |
| 6 | 4.14 | 10.9 | 3.89 | 2.70 | 3.86 | 1.34 | 3.90 | 2.30 | 4.12 | 10 00 | 4 28 | 18.7 |
| 7 | 4.09 | 8.6 | 3.89 | 2.10 | 3.86 | 1.34 | 3.90 | 2.30 | 4.13 | 10.40 | 4.28 | 18.7 |
| 8 | 4.06 | 7.2 | 3.89 | 2.10 | 3.87 | 1.58 | 3.88 | 1.82 | 4.14 | 10.90 | 4.26 | 17.4 |
| 9 | 4.06 | 7.2 | 3.89 | 2.10 | 3.87 | 1.58 | 3.88 | 1.82 | 4.15 | 11.40 | 4.25 | 16.8 |
| 10 | 4.06 | 7.2 | 3.89 | 2.10 | 3.87 | 1.58 | 3.88 | 1.82 | 4.16 | 11.90 | 4.24 | 16.2 |
| 11 | 4.05 | 6.8 | 3.88 | 1.82 | 3.86 | 1.34 | 3.89 | 2.10 | 4.18 | 13.00 | 4.24 | 16.2 |
| 12 | 4.04 | 6.4 | 3.88 | 1.82 | 3.87 | 1.58 | 3.89 | 2.10 | 4.20 | 14.00 | 4.25 | 16.8 |
| 12 | 4.05 | 6.8 | 3.88 | 1.82 | 3.87 | 1.58 | 3.90 | 2.30 | 4.22 | 15.10 | 4.26 | 17.4 |
| 14 | 4.04 | 6.4 | 3.90 | 2.30 | 3.88 | 1.82 | 3.90 | 2.30 | 4.22 | 15.10 | 4.26 | 17.4 |
| 15 | 4.04 | 6.4 | 3.90 | 2.30 | 3.89 | 2.10 | 3.91 | 2.60 | 4.21 | 14.60 | 4.28 | 18.7 |
| 16 | 4.06 | 7.2 | 3.87 | 1.58 | 3.89 | 2.10 | 3.92 | 2.80 | 4.20 | 14.00 | 4.28 | 18.7 |
| 17 | 4.04 | 6.4 | 3.86 | 1.34 | 3.88 | 1.82 | 3.92 | 2.80 | 4.18 | 13.00 | 4.32 | 21.6 |
| 18 | 3.96 | 3.9 | 3.85 | 1.10 | 3.88 | 1.82 | 3.94 | 3.30 | 4.18 | 13.00 | 4.38 | 27.0 |
| 19 | 3.94 | 3.3 | 3.85 | 1.10 | 3.86 | 1.34 | 3.96 | 3.90 | 4.17 | 12.40 | 4.38 | 27.0 |
| 20 | 3.94 | 3.3 | 3.86 | 1.34 | 3.86 | 1.34 | 3.98 | 4.40 | 4.16 | 11.90 | 4.39 | 28.0 |
| 21 | 3.94 | 3.3 | 3.86 | 1.34 | 3.86 | 1.34 | 3.99 | 4.70 | 4.15 | 11.40 | 4.38 | 27.0 |
| 22 | 3.99 | 4.7 | 3.87 | 1.58 | 3.87 | 1.58 | 4.00 | 5.00 | 4.15 | 11.40 | 4.40 | 28.0 |
| 23 | 3.96 | 3.9 | 3.88 | 1.82 | 3.87 | 1.58 | 4.02 | 5.70 | 4.14 | 10.90 | 4.43 | 31.0 |
| 24 | 3.94 | 3.3 | 3.88 | 1.82 | 3.87 | 1.58 | 4.03 | 6.10 | 4.14 | 10.90 | 4.44 | 32.0 |
| 25 | 3.92 | 2.8 | 3.88 | 1.82 | 3.88 | 1.82 | 4.03 | 6.10 | 4.13 | 10.40 | 4.46 | 35.0 |
| 26 | 3.92 | 2.8 | 3.88 | 1.82 | 3.89 | 2.10 | 4.03 | 6.10 | 4.13 | 10.40 | 4.85 | 81.0 |
| 27 | 3.92 | 2.8 | 3.86 | 1.34 | 3.88 | 1.82 | 4.04 | 6.40 | 4.14 | 10.90 | 4.70 | 63.0 |
| 28 | 3.92 | 2.8 | 3.86 | 1.34 | 3.88 | 1.82 | 4.04 | 6.40 | 4.14 | 10.90 | 4.70 | 63.0 |
| 29 | 3.92 | 2.8 | ..... | ..... | 3.87 | 1.58 | 4.05 | 6.80 | 4.17 | 12.40 | 4.70 | 63.0 |
| 30 | 3.94 | 3.3 | ..... | ..... | 3.86 | 1.34 | 4.05 | 6.80 | 4.17 | 12.40 | 4.70 | 63.0 |
| 31 | 3.92 | 2.8 | ..... | ..... | 3.86 | 1.34 | ..... | ..... | 4.18 | 13.00 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Louise Creek near Lake Louise, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 4.69 | 62 | 5.03 | 103 | 4.89 | 86.0 | 3.86 | 1.34 | 4.06 | 7.20 | 3.88 | 1.82 |
| 2 | 4.68 | 61 | 5.04 | 104 | 4.87 | 83.0 | 4.05 | 6.80 | 4.05 | 6.80 | 3.88 | 1.82 |
| 3 | 4.68 | 61 | 5.09 | 110 | 4.82 | 77.0 | 4.06 | 7.20 | 4.04 | 6.40 | 3.84 | 0.96 |
| 4 | 4.68 | 61 | 5.08 | 109 | 4.82 | 77.0 | 4.06 | 7.20 | 4.03 | 6.10 | 3.83 | 0.82 |
| 5 | 4.66 | 58 | 5.03 | 103 | 4.82 | 77.0 | 4.06 | 7.20 | 4.02 | 5.70 | 3.82 | 0.68 |
| 6 | 4.68 | 61 | 5.02 | 101 | 4.82 | 77.0 | 4.07 | 7.70 | 4.02 | 5.70 | 3.82 | 0.68 |
| 7 | 4.70 | 63 | 5.05 | 105 | 4.68 | 61.0 | 4.08 | 8.10 | 4.00 | 5.00 | 3.83 | 0.82 |
| 8 | 4.70 | 63 | 5.06 | 106 | 4.64 | 56.0 | 4.10 | 9.00 | 3.98 | 4.40 | 3.81 | 0.54 |
| 9 | 4.69 | 62 | 5.06 | 106 | 4.62 | 53.0 | 4.09 | 8.60 | 3.98 | 4.40 | 3.81 | 0.54 |
| 10 | 4.68 | 61 | 5.06 | 106 | 4.55 | 45.0 | 4.09 | 8.60 | 3.97 | 4.20 | 3.85 | 1.10 |
| 11 | 4.66 | 58 | 5.06 | 106 | 4.48 | 37.0 | 4.04 | 6.40 | 3.96 | 3.90 | 3.84 | 0.96 |
| 12 | 4.66 | 58 | 5.03 | 103 | 4.42 | 30.0 | 4.00 | 5.00 | 3.95 | 3.60 | 3.84 | 0.96 |
| 13 | 4.64 | 56 | 5.04 | 104 | 4.40 | 28.0 | 4.00 | 5.00 | 3.94 | 3.30 | 3.84 | 0.96 |
| 14 | 4.70 | 63 | 5.06 | 106 | 4.38 | 27.0 | 4.01 | 5.40 | 3.94 | 3.30 | 3.84 | 0.96 |
| 15 | 4.66 | 58 | 5.10 | 111 | 4.38 | 27.0 | 4.01 | 5.40 | 3.92 | 2.80 | 3.83 | 0.82 |
| 16 | 4.67 | 59 | 5.12 | 113 | 4.38 | 27.0 | 4.02 | 5.70 | 3.92 | 2.80 | 3.83 | 0.82 |
| 17 | 4.69 | 62 | 5.12 | 113 | 4.38 | 27.0 | 4.02 | 5.70 | 3.93 | 3.10 | 3.81 | 0.54 |
| 18 | 4.70 | 63 | 5.10 | 110 | 4.38 | 27.0 | 4.04 | 6.40 | 3.93 | 3.10 | 3.81 | 0.54 |
| 19 | 4.78 | 73 | 5.06 | 106 | 4.36 | 25.0 | 4.04 | 6.40 | 3.93 | 3.10 | 3.79 | 0.35 |
| 20 | 4.80 | 75 | 5.02 | 101 | 4.37 | 26.0 | 4.05 | 6.80 | 3.92 | 2.80 | 3.79 | 0.35 |
| 21 | 4.79 | 74 | 4.98 | 97 | 4.34 | 23.0 | 4.05 | 6.80 | 3.90 | 2.30 | 3.79 | 0.35 |
| 22 | 4.78 | 73 | 4.98 | 97 | 4.30 | 20.0 | 4.05 | 6.80 | 3.92 | 2.80 | 3.79 | 0.35 |
| 23 | 4.80 | 75 | 5.02 | 101 | 4.30 | 20.0 | 4.04 | 6.40 | 3.91 | 2.60 | 3.78 | 0.30 |
| 24 | 4.80 | 75 | 5.02 | 101 | 4.29 | 19.4 | 4.04 | 6.40 | 3.90 | 2.30 | 3.78 | 0.30 |
| 25 | 4.79 | 74 | 4.98 | 97 | 4.28 | 18.7 | 4.03 | 6.10 | 3.90 | 2.30 | 3.78 | 0.30 |
| 26 | 4.78 | 73 | 4.96 | 94 | 4.26 | 17.4 | 4.04 | 6.40 | 3.89 | 2.10 | 3.78 | 0.30 |
| 27 | 4.79 | 74 | 4.98 | 97 | 4.26 | 17.4 | 4.04 | 6.40 | 3.88 | 1.82 | 3.78 | 0.30 |
| 28 | 4.82 | 77 | 4.98 | 97 | 4.25 | 16.8 | 4.04 | 6.40 | 3.88 | 1.82 | 3.78 | 0.30 |
| 29 | 4.84 | 80 | 4.96 | 94 | 4.25 | 16.8 | 4.04 | 6.40 | 3.88 | 1.82 | 3.78 | 0.30 |
| 30 | 4.86 | 82 | 4.96 | 94 | 4.25 | 16.8 | 4.04 | 6.40 | 3.87 | 1.55 | 3.78 | 0.30 |
| 31 | 4.98 | 97 | 4.96 | 94 | ..... | ..... | 4.05 | 6.80 | ..... | ..... | 3.78 | 0.30 |

MONTHLY DISCHARGE of Louise Creek near Lake Louise, for 1915.

(Drainage area 11 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 10.9 | 2.80 | 5.7 | 0.518 | 0.60 | 350 |
| February | 3.3 | 1.10 | 1.93 | 0.175 | 0.18 | 107 |
| March | 2.1 | 1.10 | 1.58 | 0.144 | 0.17 | 97 |
| April | 6.8 | 1.58 | 3.57 | 0.324 | 0.36 | 212 |
| May | 15.1 | 7.20 | 11.60 | 1.05 | 1.21 | 713 |
| June | 81.0 | 10.90 | 29.00 | 2.64 | 2.94 | 1,726 |
| July | 97.0 | 56.00 | 67.00 | 6.09 | 7.02 | 4,120 |
| August | 113.0 | 94.00 | 103.00 | 9.36 | 10.79 | 6,333 |
| September | 86.0 | 16.80 | 39.00 | 3.54 | 3.95 | 2,321 |
| October | 9.0 | 1.34 | 6.50 | 5.91 | 0.68 | 400 |
| November | 7.2 | 1.58 | 3.60 | 0.327 | 0.36 | 214 |
| December | 1.8 | 0.30 | 0.66 | 0.060 | 0.07 | 41 |
| The year | ..... | ..... | ..... | ..... | 28.33 | 16,634 |

FORTYMILE CREEK NEAR BANFF.

*Location.*—On the SW. ¼ Sec. 2, Tp. 26, Rge. 12, W. 5th Mer., near the Canadian Pacific Railway station at Banff and one mile from the mouth of the stream.

*Records available.*—Aug. 1, 1912, to Dec. 31, 1915.

*Gauge.*—Vertical staff. Elevation of zero, 91.43 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark on right bank. Assumed elevation, 100.00 feet.

*Channel.*—Clay and gravel.

*Discharge measurements.*—Made from a bridge, wading when low.

*Flood.*—The stream was in flood June 26, 1915, maximum gauge height, 6.60, stream did not overflow its banks; high water caused from excessive rain of June 25.

*Observer.*—Peter Petersen.

DISCHARGE MEASUREMENTS of Fortymile Creek near Banff, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 14 | H. C. Ritchie | 25.0 | 38.0 | 0.38 | 2.44 | 22.2 |
| Jan. 30 | do | 23.0 | 29.2 | 0.58 | 2.89 | 16.9 |
| Feb. 13 | do | 25.0 | 34.6 | 0.68 | 2.37 | 23.7 |
| Feb. 20 | do | 25.0 | 32.5 | 0.60 | 2.31 | 19.4 |
| Mar. 4 | do | 24.5 | 31.0 | 0.45 | 2.27 | 14.1 |
| Mar. 22 | do | 25.0 | 30.8 | 0.52 | 2.30 | 16.0 |
| April 5 | do | 25.0 | 33.4 | 0.64 | 2.34 | 21.0 |
| April 24 | O. H. Hoover | 26.0 | 41.4 | 1.28 | 2.67 | 53.0 |
| May 7 | H. C. Ritchie | 29.0 | 53.0 | 1.66 | 2.90 | 88.0 |
| May 25 | do | 29.5 | 51.9 | 1.71 | 3.08 | 89.0 |
| June 12 | do | 29.5 | 54.4 | 1.80 | 3.16 | 98.0 |
| June 21 | do | 32.0 | 73.1 | 2.16 | 3.84 | 158.0 |
| July 1 | do | 32.0 | 144.2 | 3.10 | 6.19 | 447.0 |
| July 22 | do | 32.0 | 97.6 | 2.39 | 4.62 | 233.0 |
| Aug. 9 | do | 31.0 | 66.6 | 1.93 | 3.58 | 129.0 |
| Aug. 28 | do | 29.0 | 55.8 | 1.64 | 3.19 | 91.0 |
| Sept. 25 | do | 29.5 | 48.4 | 1.60 | 2.98 | 77.0 |
| Oct. 19 | do | 28.5 | 45.2 | 1.41 | 2.79 | 64.0 |
| Nov. 1 | do | 27.0 | 41.8 | 1.29 | 2.73 | 54.0 |
| Nov. 19 | J. E. Caughey | 29.0 | 42.2 | 1.14 | 2.67 | 48.0 |
| Nov. 27 | do | 24.0 | 19.9 | 1.52 | 2.67 | 30.0 |
| Dec. 10 | do | 19.0 | 14.3 | 1.37 | 2.45 | 19.7 |
| Dec. 27 | H. C. Ritchie | 24.0 | 12.3 | 1.24 | 2.38 | 15.2 |

Winter conditions Nov. 19 to Dec. 31.

DAILY GAUGE HEIGHT AND DISCHARGE of Fortymile Creek near Banff, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.48 | 32.0 | 2.48*a* | 19.0 | 2.30 | 16.5 | 2.30 | 16.5 | 2.81 | 60 | 3.21 | 94 |
| 2 | 2.42 | 27.0 | 2.46 | 19.5 | 2.28 | 14.8 | 2.29 | 15.6 | 2.80 | 59 | 3.32 | 104 |
| 3 | 2.45 | 30.0 | 2.35 | 21.0 | 2.28 | 14.8 | 2.31 | 17.4 | 2.79 | 58 | 3.28 | 100 |
| 4 | 2.48 | 32.0 | 2.34 | 19.9 | 2.29 | 15.6 | 2.33 | 19.0 | 2.79 | 58 | 3.21 | 94 |
| 5 | 2.40 | 25.0 | 2.33 | 19.0 | 2.30 | 16.5 | 2.31 | 17.4 | 2.78 | 57 | 3.33 | 105 |
| 6 | 2.70 | 50.0 | 2.33 | 19.0 | 2.26 | 13.1 | 2.31 | 17.4 | 2.77 | 56 | 3.27 | 99 |
| 7 | 2.50 | 34.0 | 2.32 | 18.2 | 2.27 | 14.0 | 2.30 | 16.5 | 2.88 | 67 | 3.32 | 104 |
| 8 | 2.50 | 34.0 | 2.34 | 19.9 | 2.26 | 13.1 | 2.34 | 19.9 | 2.94 | 71 | 3.38 | 109 |
| 9 | 2.48 | 32.0 | 2.34 | 19.9 | 2.27 | 14.0 | 2.35 | 21.0 | 3.24 | 97 | 3.42 | 113 |
| 10 | 2.49 | 33.0 | 2.34 | 19.9 | 2.27 | 14.0 | 2.34 | 19.9 | 3.36 | 107 | 3.44 | 115 |
| 11 | 2.48 | 32.0 | 2.35 | 21.0 | 2.27 | 14.0 | 2.36 | 22.0 | 3.23 | 96 | 3.43 | 114 |
| 12 | 2.46 | 30.0 | 2.35 | 21.0 | 2.28 | 14.8 | 2.35 | 21.0 | 3.18 | 91 | 3.15 | 89 |
| 13 | 2.35 | 21.0 | 2.35 | 21.0 | 2.27 | 14.0 | 2.37 | 22.0 | 3.16 | 90 | 3.19 | 92 |
| 14 | 2.33 | 19.0 | 2.74 | 54.0 | 2.26 | 13.1 | 2.39 | 24.0 | 3.09 | 84 | 3.22 | 95 |
| 15 | 2.35 | 21.0 | 2.38 | 23.0 | 2.26 | 13.1 | 2.41 | 26.0 | 3.05 | 80 | 3.36 | 107 |
| 16 | 2.50 | 34.0 | 2.36 | 22.0 | 2.27 | 14.0 | 2.46 | 30.0 | 2.98 | 74 | 3.52 | 122 |
| 17 | 2.38 | 23.0 | 2.35 | 21.0 | 2.27 | 14.0 | 2.52 | 35.0 | 2.97 | 73 | 4.02 | 169 |
| 18 | 2.48 | 32.0 | 2.35 | 21.0 | 2.29 | 15.6 | 2.56 | 39.0 | 2.93 | 70 | 4.01 | 168 |
| 19 | 2.48 | 32.0 | 2.37 | 22.0 | 2.28 | 14.8 | 2.66 | 47.0 | 2.88 | 67 | 3.99 | 166 |
| 20 | 2.35 | 21.0 | 2.33 | 19.0 | 2.27 | 14.0 | 2.72 | 52.0 | 2.84 | 62 | 3.90 | 157 |
| 21 | 2.50 | 34.0 | 2.34 | 19.9 | 2.30 | 16.5 | 2.74 | 54.0 | 2.88 | 67 | 3.84 | 151 |
| 22 | 2.48 | 32.0 | 2.34 | 19.9 | 2.30 | 16.5 | 2.74 | 54.0 | 2.90 | 68 | 3.89 | 156 |
| 23 | 2.49 | 33.0 | 2.33 | 19.0 | 2.30 | 16.5 | 2.68 | 49.0 | 2.97 | 73 | 4.04 | 171 |
| 24 | 2.47 | 31.0 | 2.29 | 15.6 | 2.31 | 17.4 | 2.68 | 49.0 | 2.97 | 73 | 4.23 | 190 |
| 25 | 2.34 | 19.9 | 2.29 | 15.6 | 2.30 | 16.5 | 2.67 | 48.0 | 3.09 | 84 | 4.67 | 239 |
| 26 | 2.51*a* | 14.0 | 2.29 | 15.6 | 2.41 | 26.0 | 2.69 | 50.0 | 3.09 | 84 | 6.60 | 508 |
| 27 | 2.58*a* | 14.2 | 2.31 | 17.4 | 2.35 | 21.0 | 2.67 | 48.0 | 3.08 | 83 | 6.29 | 462 |
| 28 | 2.55*a* | 15.0 | 2.28 | 14.8 | 2.30 | 16.5 | 2.65 | 46.0 | 3.14 | 88 | 6.26 | 457 |
| 29 | 2.88*a* | 16.0 | ..... | ..... | 2.28 | 14.8 | 2.63 | 43.0 | 3.23 | 96 | 6.08 | 430 |
| 30 | 2.86*a* | 16.9 | ..... | ..... | 2.30 | 16.5 | 2.79 | 58.0 | 3.19 | 92 | 6.07 | 428 |
| 31 | 2.68*a* | 17.5 | ..... | ..... | 2.29 | 15.6 | ..... | ..... | 3.20 | 93 | ..... | ..... |

*a* Ice conditions Jan. 26 to Feb. 1.

DAILY GAUGE HEIGHT AND DISCHARGE of Fortymile Creek near Banff, for 1915.—*Concluded.*

| Day | July. | | August. | | September. | | October. | | November. | | December | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 6.01 | 420 | 4.01 | 168 | 3.10 | 84 | 2.90 | 68 | 2.71 | 51 | 2.47 | 27 |
| 2 | 5.58 | 356 | 3.99 | 166 | 3.12 | 86 | 2.90 | 68 | 2.72 | 52 | 2.48 | 26 |
| 3 | 5.15 | 298 | 3.94 | 161 | 3.10 | 84 | 2.90 | 68 | 2.72 | 52 | 2.66 | 24 |
| 4 | 5.03 | 283 | 3.84 | 151 | 3.11 | 85 | 2.89 | 67 | 2.72 | 52 | 2.79 | 24 |
| 5 | 5.14 | 297 | 3.71 | 139 | 3.06 | 81 | 2.90 | 68 | 2.70 | 50 | 2.74 | 23 |
| 6 | 5.04 | 284 | 3.67 | 135 | 3.04 | 79 | 2.90 | 68 | 2.68 | 49 | 2.70 | 22 |
| 7 | 4.98 | 276 | 3.61 | 130 | 3.05 | 80 | 2.90 | 68 | 2.68 | 49 | 2.69 | 22 |
| 8 | 4.79 | 253 | 3.52 | 122 | 3.00 | 76 | 2.90 | 68 | 2.74 | 54 | 2.71 | 21 |
| 9 | 4.57 | 228 | 3.49 | 119 | 2.98 | 74 | 2.89 | 67 | 2.74 | 54 | 2.70 | 20 |
| 10 | 4.47 | 217 | 3.48 | 118 | 2.97 | 73 | 2.86 | 64 | 2.76 | 56 | 2.45 | 20 |
| 11 | 4.19 | 186 | 3.44 | 115 | 2.94 | 71 | 2.83 | 62 | 2.67 | 48 | 2.44 | 19 |
| 12 | 4.01 | 168 | 3.41 | 112 | 2.93 | 70 | 2.85 | 63 | 2.61 | 43 | 2.70 | 19 |
| 13 | 3.87 | 154 | 3.32 | 104 | 2.91 | 68 | 2.84 | 62 | 2.47 | 31 | 2.44 | 18 |
| 14 | 4.27 | 195 | 3.26 | 98 | 2.89 | 67 | 2.84 | 62 | 2.47 | 31 | 2.46 | 18 |
| 15 | 4.31 | 199 | 3.28 | 100 | 2.88 | 67 | 2.82 | 61 | 2.74 | 54 | 2.42 | 18 |
| 16 | 4.48 | 218 | 3.29 | 101 | 2.87 | 65 | 2.80 | 59 | 2.80 | 59 | 2.40 | 17 |
| 17 | 4.71 | 243 | 3.35 | 106 | 2.87 | 65 | 2.79 | 58 | 2.92 | 69 | 2.39 | 17 |
| 18 | 4.68 | 240 | 3.44 | 115 | 2.87 | 65 | 2.80 | 59 | 2.73 | 53 | 2.41 | 17 |
| 19 | 4.64 | 235 | 3.49 | 119 | 2.88 | 67 | 2.79 | 58 | 2.71 | 48*a* | 2.43 | 16 |
| 20 | 4.58 | 229 | 3.50 | 120 | 2.90 | 68 | 2.78 | 57 | 2.73 | 47 | 2.44 | 16 |
| 21 | 4.59 | 230 | 3.45 | 115 | 2.92 | 69 | 2.77 | 56 | 2.47 | 46 | 2.63 | 16 |
| 22 | 4.52 | 222 | 3.38 | 109 | 2.93 | 70 | 2.75 | 55 | 2.71 | 44 | 2.61 | 16 |
| 23 | 4.37 | 206 | 3.39 | 110 | 2.97 | 73 | 2.75 | 55 | 2.72 | 42 | 2.52 | 16 |
| 24 | 4.24 | 191 | 3.34 | 106 | 2.97 | 73 | 2.75 | 55 | 2.70 | 39 | 2.40 | 15 |
| 25 | 4.13 | 180 | 3.28 | 100 | 2.94 | 71 | 2.74 | 54 | 2.71 | 36 | 2.38 | 15 |
| 26 | 4.03 | 170 | 3.24 | 97 | 2.93 | 70 | 2.74 | 54 | 2.74 | 32 | 2.43 | 15 |
| 27 | 3.98 | 165 | 3.19 | 92 | 2.92 | 69 | 2.78 | 57 | 2.67 | 30 | 2.38 | 15 |
| 28 | 4.07 | 174 | 3.19 | 92 | 2.91 | 68 | 2.75 | 55 | 2.42 | 29 | 2.36 | 16 |
| 29 | 4.04 | 171 | 3.10 | 84 | 2.90 | 68 | 2.75 | 55 | 2.43 | 28 | 2.37 | 16 |
| 30 | 4.00 | 167 | 3.11 | 85 | 2.90 | 68 | 2.75 | 55 | 2.47 | 27 | 3.18 | 16 |
| 31 | 4.02 | 169 | 3.10 | 84 | ..... | ..... | 2.74 | 54 | ..... | ..... | 2.98*a* | 17 |

*a* Ice conditions Nov. 19 to Dec. 31.

MONTHLY DISCHARGE of Fortymile Creek, near Banff, for 1915.

(Drainage area 62 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area | Total in Acre-feet |
| January | 50 | 14.0 | 27.0 | 0.435 | 0.50 | 1,660 |
| February | 54 | 14.8 | 20.0 | 0.322 | 0.34 | 1,111 |
| March | 26 | 13.1 | 15.5 | 0.250 | 0.29 | 958 |
| April | 58 | 15.6 | 33.0 | 0.532 | 0.59 | 1,964 |
| May | 107 | 56.0 | 77.0 | 1.240 | 1.43 | 4,734 |
| June | 508 | 89.0 | 184.0 | 2.970 | 3.31 | 10,949 |
| July | 420 | 154.0 | 227.0 | 3.660 | 4.22 | 13,958 |
| August | 168 | 84.0 | 115.0 | 1.850 | 2.13 | 7,071 |
| September | 86 | 65.0 | 72.0 | 1.160 | 1.29 | 4,284 |
| October | 68 | 54.0 | 61.0 | 0.984 | 1.13 | 3,751 |
| November | 60 | 27.0 | 45.0 | 0.726 | 0.81 | 2,678 |
| December | 27 | 15.0 | 18.6 | 0.300 | 0.35 | 1,144 |
| The year | | | | | 21.95 | 84,247 |

BOW RIVER AT BANFF.

*Location.*—On the SE. ¼ Sec. 35, Tp. 25, Rge. 12, W. 5th Mer., at the highway bridge at Banff.

*Records available.*—May 25, 1909, to November 11, 1909. April 26, 1910, to December 31, 1915.

*Gauge.*—Chain gauge on bridge. Elevation of zero maintained at 92.04 feet during 1909–12. Elevation of zero maintained at 93.21 feet during 1913. Elevation of zero maintained at 93.06 feet during 1914. Elevation of zero maintained at 87.23 feet during 1915.

*Bench-mark.*—Permanent iron bench-mark on right bank. Assumed elevation, 100.00 feet. This bench-mark is at datum 99.68 feet referred to the old bench-mark now destroyed.

*Channel.*—Permanent, bed of stream gravel and boulders.

*Discharge measurements.*—Made from a bridge, which has been moved 75 feet downstream during the year.

*Winter flow.*—This station is entirely free from the back water effect of ice, and one discharge curve is used throughout the year.

*Flood.*—The stream was in flood June 27, maximum gauge height, 10.33 feet and discharge 8,335 sec.-ft.; stream did not overflow banks.

*Observer.*—N. B. Sanson.

DISCHARGE MEASUREMENTS of Bow River at Banff, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 16 | H. C. Ritchie | 55.5 | 132.0 | 2.45 | 6.07 | 324.0 |
| Feb. 12 | do | 55.5 | 130.0 | 2.29 | 6.24 | 296.0 |
| Feb. 19 | do | 54.5 | 123.0 | 2.28 | 6.10 | 281.0 |
| Mar. 8 | do | 66.0 | 131.0 | 1.95 | 5.99 | 256.0 |
| Mar. 20 | do | 78.0 | 134.0 | 2.08 | 6.05 | 280.0 |
| April 3 | do | 94.0 | 158.0 | 2.28 | 6.20 | 360.0 |
| April 19 | O. H. Hoover | 191.5 | 330.6 | 2.93 | 7.32 | 970.0 |
| May 12 | H. C. Ritchie | 335.0 | 694.4 | 2.91 | 8.11 | 2,022.0 |
| May 29 | do | 334.0 | 715.6 | 3.06 | 8.16 | 2,194.0 |
| June 11 | do | 334.0 | 660.1 | 2.86 | 7.94 | 1,889.0 |
| June 28 | do | 369.0 | 1,401.0 | 5.32 | 10.07 | 7,450.0 |
| July 2 | do | 364.0 | 1,243.0 | 4.59 | 9.58 | 5,709.0 |
| July 12 | do | 361.0 | 959.2 | 3.55 | 8.79 | 3,402.0 |
| July 19 | do | 363.0 | 1,135.1 | 4.03 | 9.24 | 4,577.0 |
| Aug. 14 | do | 362.0 | 953.9 | 3.44 | 8.74 | 3,284.0 |
| Aug. 30 | do | 355.0 | 879.6 | 3.19 | 8.57 | 2,803.0 |
| Oct 5 | do | 329.0 | 496.7 | 2.11 | 7.35 | 1,046.0 |
| Oct. 22 | do | 239.0 | 359.2 | 2.15 | 7.10 | 771.0 |
| Nov. 4 | do | 234.5 | 332.6 | 2.06 | 7.02 | 685.0 |
| Nov. 15 | J. E. Caughey | 123.0 | 228.1 | 2.40 | 6.75 | 550.0 |
| Nov. 30 | do | 128.0 | 243.6 | 2.08 | 6.60 | 509.0 |
| Dec. 11 | do | 115.0 | 230.6 | 2.06 | 6.46 | 477.0 |
| Dec. 29 | H. C. Ritchie | 73.0 | 157.0 | 2.38 | 6.33 | 374.0 |

DAILY GAUGE HEIGHT AND DISCHARGE of Bow River at Banff, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 6.30*a* | 335 | 5.99 | 258 | 6.04 | 268 | 6.06 | 272 | 7.62 | 1,326 | 8.08 | 1,998 |
| 2 | 6.28*a* | 329 | 5.97 | 255 | 5.98 | 257 | 6.06 | 272 | 7.69 | 1,417 | 8.17 | 2,152 |
| 3 | 6.31*a* | 338 | 5.98 | 257 | 6.00 | 260 | 6.18 | 300 | 7.37 | 1,034 | 8.10 | 2,030 |
| 4 | 6.28*a* | 329 | 5.96 | 254 | 6.01 | 262 | 6.27 | 326 | 7.37 | 1,034 | 8.10 | 2,030 |
| 5 | 6.24*a* | 317 | 5.93 | 249 | 6.01 | 262 | 6.25 | 320 | 7.35 | 1,012 | 8.17 | 2,152 |
| 6 | 6.22*a* | 311 | 5.96 | 254 | 5.98 | 257 | 6.25 | 320 | 7.40 | 1,065 | 8.16*a* | 2,135 |
| 7 | 6.25*a* | 320 | 5.96*a* | 254 | 5.99*a* | 258 | 6.27 | 326 | 7.56 | 1,252 | 8.14*a* | 2,100 |
| 8 | 6.26*a* | 323 | 5.98 | 257 | 6.00 | 260 | 6.34 | 347 | 7.92 | 1,746 | 8.10*a* | 2,030 |
| 9 | 6.27 | 326 | 5.99 | 258 | 6.06 | 272 | 6.27 | 326 | 8.22 | 2,242 | 8.09*a* | 2,014 |
| 10 | 6.22 | 311 | 6.06 | 272 | 6.00 | 260 | 6.24 | 317 | 8.35 | 2,485 | 8.05 | 1,950 |
| 11 | 6.21 | 308 | 6.10 | 280 | 6.00 | 260 | 6.28*a* | 329 | 8.29 | 2,372 | 7.94 | 1,777 |
| 12 | 6.19 | 303 | 6.15 | 292 | 6.02 | 264 | 6.31 | 338 | 8.07 | 1,982 | 7.92 | 1,746 |
| 13 | 6.12 | 285 | 6.24 | 317 | 6.00 | 260 | 6.38 | 359 | 8.03 | 1,918 | 7.96*a* | 1,808 |
| 14 | 6.09 | 278 | 6.26*a* | 323 | 6.20 | 305 | 6.51 | 404 | 7.94 | 1,777 | 8.05 | 1,950 |
| 15 | 6.08 | 276 | 6.24*a* | 317 | 6.03 | 266 | 6.57 | 432 | 7.80 | 1,570 | 8.18 | 2,170 |
| 16 | 6.06 | 272 | 6.20*a* | 305 | 6.04 | 268 | 6.69 | 494 | 7.70*a* | 1,430 | 8.33 | 2,447 |
| 17 | 6.12 | 285 | 6.16*a* | 295 | 6.01 | 262 | 6.82 | 572 | 7.61 | 1,313 | 8.71 | 3,212 |
| 18 | 6.14 | 290 | 6.06*a* | 272 | 6.01 | 262 | 7.09 | 762 | 7.54 | 1,228 | 8.70 | 3,190 |
| 19 | 6.11 | 282 | 6.10 | 280 | 6.02 | 264 | 7.25 | 910 | 7.50 | 1,180 | 8.61 | 3,001 |
| 20 | 6.11 | 282 | 6.11 | 282 | 6.04 | 268 | 7.27 | 930 | 7.46 | 1,134 | 8.61 | 3,001 |
| 21 | 5.96 | 254 | 6.11*a* | 282 | 6.06*a* | 272 | 7.38 | 1,044 | 7.51 | 1,192 | 8.50 | 2,780 |
| 22 | 5.95 | 253 | 6.11 | 282 | 6.10 | 280 | 7.12 | 788 | 7.62 | 1,326 | 8.52 | 2,820 |
| 23 | 6.00 | 260 | 6.11 | 282 | 6.16 | 295 | 7.12 | 788 | 7.70*a* | 1,430 | 8.67 | 3,127 |
| 24 | 6.00*a* | 260 | 6.07 | 274 | 6.10 | 280 | 7.10 | 770 | 7.83 | 1,614 | 8.77 | 3,344 |
| 25 | 5.99 | 258 | 6.08 | 276 | 5.95 | 253 | 7.08*a* | 754 | 7.87 | 1,672 | 9.07 | 4,109 |
| 26 | 6.00 | 260 | 6.09 | 278 | 5.90 | 245 | 7.07 | 746 | 7.97 | 1,823 | 10.14 | 7,670 |
| 27 | 5.90 | 245 | 6.08 | 276 | 5.95 | 253 | 7.08 | 754 | 7.91 | 1,731 | 10.33 | 8,335 |
| 28 | 5.93*a* | 249 | 6.07*a* | 274 | 6.00*a* | 260 | 7.00 | 690 | 7.99 | 1,854 | 9.97 | 7,075 |
| 29 | 5.96 | 254 | ..... | ..... | 6.06 | 272 | 7.03 | 714 | 8.17 | 2,152 | 9.81 | 6,515 |
| 30 | 5.97 | 255 | ..... | ..... | 6.03 | 266 | 7.50 | 1,180 | 8.14 | 2,100 | 9.76 | 6,340 |
| 31 | 5.98 | 257 | ..... | ..... | 6.05 | 270 | ..... | ..... | 7.98 | 1,839 | ..... | ..... |

*a* Gauge heights interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of Bow River at Banff, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 9.79 | 6,445 | 9.08 | 4,136 | 8.56 | 2,900 | 7.43 | 1,099 | 7.14 | 806 | 6.48 | 452 |
| 2 | 9.62 | 5,850 | 9.10 | 4,190 | 8.46 | 2,700 | 7.46 | 1,134 | 7.06 | 738 | 6.42 | 428 |
| 3 | 9.32 | 4,834 | 9.12 | 4,246 | 8.38 | 2,542 | 7.42 | 1,008 | 7.11 | 778 | 6.58 | 492 |
| 4 | 9.34*a* | 4,898 | 9.09 | 4,163 | 8.34 | 2,466 | 7.39 | 1,055 | 7.02 | 706 | 6.70 | 540 |
| 5 | 9.36 | 4,962 | 8.98 | 3,868 | 8.28 | 2,353 | 7.38 | 1,044 | 7.05 | 730 | 6.66*a* | 524 |
| 6 | 9.47 | 5,328 | 8.93 | 3,738 | 8.32 | 2,428 | 7.35 | 1,012 | 6.81 | 585 | 6.63 | 512 |
| 7 | 9.38 | 5,026 | 8.90 | 3,660 | 8.21 | 2,223 | 7.29 | 950 | 6.78*a* | 572 | 6.60 | 500 |
| 8 | 9.30 | 4,770 | 8.90 | 3,660 | 8.02 | 1,902 | 7.26 | 920 | 6.75 | 560 | 6.60 | 500 |
| 9 | 9.23 | 4,560 | 8.92 | 3,712 | 8.09 | 2,014 | 7.25 | 910 | 6.83 | 595 | 6.61 | 504 |
| 10 | 9.15 | 4,330 | 8.85 | 3,535 | 7.86 | 1,657 | 7.21*a* | 870 | 6.73 | 552 | 6.45 | 440 |
| 11 | 8.90*a* | 3,660 | 8.75 | 3,300 | 7.75 | 1,500 | 7.18 | 842 | 6.61 | 504 | 6.46 | 444 |
| 12 | 8.70 | 3,190 | 8.79 | 3,388 | 7.71 | 1,444 | 7.15 | 815 | 6.52 | 468 | 6.47*a* | 448 |
| 13 | 8.67 | 3,127 | 8.75 | 3,300 | 7.63 | 1,339 | 7.15 | 815 | 6.43 | 432 | 6.48 | 452 |
| 14 | 8.89 | 3,635 | 8.74 | 3,278 | 7.57 | 1,264 | 7.14 | 806 | 6.59*a* | 496 | 6.53 | 472 |
| 15 | 9.05 | 4,055 | 8.81 | 3,435 | 7.54 | 1,228 | 7.10 | 770 | 6.76 | 564 | 6.45 | 440 |
| 16 | 9.20*a* | 4,470 | 8.84 | 3,510 | 7.51 | 1,192 | 7.10 | 770 | 6.79 | 576 | 6.40 | 420 |
| 17 | 9.32 | 4,834 | 8.74 | 3,278 | 7.48 | 1,157 | 7.08*a* | 754 | 6.80 | 580 | 6.44 | 436 |
| 18 | 9.23 | 4,560 | 8.89 | 3,635 | 7.44 | 1,111 | 7.06 | 738 | 6.78 | 572 | 6.46 | 444 |
| 19 | 9.25 | 4,620 | 8.95 | 3,790 | 7.56 | 1,252 | 7.18 | 842 | 6.79 | 576 | 6.46*a* | 444 |
| 20 | 9.21*a* | 4,500 | 9.01 | 3,947 | 7.59 | 1,288 | 7.15 | 815 | 6.77 | 568 | 6.46 | 444 |
| 21 | 9.18 | 4,414 | 8.95 | 3,790 | 7 53 | 1,216 | 7.14 | 806 | 6.72*a* | 548 | 6.47*a* | 448 |
| 22 | 9.18 | 4,414 | 8.84 | 3,510 | 7.46 | 1,134 | 7.13 | 797 | 6.67 | 528 | 6.49 | 456 |
| 23 | 9.19 | 4,442 | 8.87 | 3,585 | 7.49 | 1,168 | 7.12 | 788 | 6.76 | 564 | 6.43 | 432 |
| 24 | 8.98 | 3,868 | 8.83 | 3,485 | 7.56 | 1,252 | 7.12*a* | 788 | 6.71 | 544 | 6.39 | 416 |
| 25 | 8.97 | 3,842 | 8.79 | 3,388 | 7.44 | 1,111 | 7.11 | 779 | 6.67 | 528 | 6.45 | 440 |
| 26 | 8.94 | 3,764 | 8.75 | 3,300 | 7.42 | 1,088 | 7.10 | 770 | 6.69 | 536 | 6.34*a* | 396 |
| 27 | 8.89 | 3,635 | 8.73 | 3,256 | 7.40 | 1,065 | 7.16 | 824 | 6.66 | 524 | 6.23 | 352 |
| 28 | 9.07 | 4,109 | 8.66 | 3,106 | 7.41 | 1,077 | 7.16 | 824 | 6.58*a* | 492 | 6.42 | 428 |
| 29 | 9.05 | 4,055 | 8.59 | 2,960 | 7.36 | 1,023 | 7.20 | 860 | 6.50 | 460 | 6.32 | 388 |
| 30 | 9.04*a* | 4,028 | 8.63 | 3,043 | 7.34 | 1,002 | 7.19 | 851 | 6.60*b* | 500 | 6.23 | 352 |
| 31 | 9.03 | 4,001 | 8.65 | 3,085 | ..... | ..... | 7.17*a* | 833 | ..... | ..... | 6.26 | 364 |

*a* Gauge heights interpolated.
*b* Used gauge height from meter gauging taken.
Nov. 1–Dec. 31 Curve No. 2.

MONTHLY DISCHARGE of Bow River at Banff, for 1915.

(Drainage area 890 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 338 | 245 | 287 | 0.322 | 0.37 | 17,647 |
| February | 323 | 249 | 277 | 0.311 | 0.32 | 15,384 |
| March | 305 | 245 | 266 | 0.299 | 0.34 | 16,356 |
| April | 1,180 | 272 | 553 | 0.621 | 0.69 | 32,906 |
| May | 2,485 | 1,012 | 1,589 | 1.780 | 2.05 | 97,700 |
| June | 8,335 | 1,746 | 3,234 | 3.630 | 4.05 | 192,436 |
| July | 6,445 | 3,127 | 4,394 | 4.940 | 5.70 | 270,170 |
| August | 4,246 | 2,960 | 3,557 | 4.000 | 4.61 | 218,710 |
| September | 2,900 | 1,002 | 1,570 | 1.760 | 1.96 | 93,420 |
| October | 1,134 | 738 | 870 | 0.978 | 1.13 | 53,494 |
| November | 806 | 375 | 548 | 0.616 | 0.69 | 32,608 |
| December | 540 | 352 | 445 | 0.500 | 0.58 | 27,362 |
| The year | ..... | ..... | ..... | ..... | 22.49 | 1,068,193 |

SPRAY RIVER NEAR SPRAY LAKES.

*Location.*—On the SE. ¼ Sec. 31, Tp. 22, Rge. 10, W. 5th Mer.
*Records available.*—July 23 to October 27, 1914, and June 9 to October 17, 1915.
*Gauge.*—Chain gauge on right bank.
*Bench-mark.*—On tree. Elevation, 11.48 feet above the zero of the gauge.
*Channel.*—Permanent.
*Discharge measurements.*—Made by wading. Cable station installed above gauge September 15, 1915.
*Observer.*—Louis Mumford.
*Remarks.*—Insufficient discharge measurements have been made to accurately determine the daily discharge. The installation of the cable station will enable gaugings to be made during the period of summer floods.

DISCHARGE MEASUREMENTS of Spray River near Spray Lakes, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Sept. 15 | H. C. Ritchie | 79.5 | 132.5 | 1.77 | 5.63 | 234 |

DAILY GAUGE HEIGHT, IN FEET, of Spray River near Spray Lakes, for 1915.

| Day. | June. | July. | August. | September. | October. |
|---|---|---|---|---|---|
| 1 | | 8.13 | 6.45 | | |
| 2 | | | | | |
| 3 | | 8.11 | 6.45 | | |
| 4 | | | | | |
| 5 | | 8.13 | 6.39 | | 5.50 |
| 6 | | | | | |
| 7 | | 8.15 | 6.32 | | 5.50 |
| 8 | | | | 5.76 | 5.49 |
| 9 | 7.13 | 8.19 | 6.30 | 5.74 | |
| 10 | | | | 5.68 | |
| 11 | 7.11 | 8.24 | 6.27 | 5.67 | 5.47 |
| 12 | | | | 5.68 | |
| 13 | 7.13 | 8.23 | 6.23 | 5.68 | 5.45 |
| 14 | | | | 5.67 | |
| 15 | 7.30 | 8.29 | 6.18 | 5.63 | 5.43 |
| 16 | | | | | |
| 17 | 7.50 | 8.24 | 6.16 | 5.60 | 5.41 |
| 18 | | | | 5.59 | |
| 19 | 7.62 | | 6.15 | 5.59 | |
| 20 | | | | | |
| 21 | 7.61 | | 6.13 | 5.58 | |
| 22 | | | | | |
| 23 | 7.63 | | 6.08 | 5.57 | |
| 24 | | | | 5.57 | |
| 25 | 7.66 | | 6.03 | 5.56 | |
| 26 | | | | | |
| 27 | 8.06 | 6.51 | 6.02 | 5.55 | |
| 28 | | | | | |
| 29 | 8.21 | | | | |
| 30 | | 6.47 | | 5.54 | |
| 31 | | | | | |

SPRAY CREEK AT SPRAY LAKES.

*Location.*—On the SW. ¼ Sec. 32, Tp. 22, Rge. 10, W. 5th Mer.
*Records available.*—July 23 to October 27, 1914, and June 9 to October 17, 1915.
*Gauge.*—Vertical staff at left bank.
*Bench-mark.*—On tree. Elevation, 4.98 feet above the zero of gauge.
*Channel.*—Permanent.
*Discharge measurements.*—Made by wading.
*Observer.*—Louis Mumford.

DISCHARGE MEASUREMENTS of Spray Creek at Spray Lakes, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| July 27 | H. C. Ritchie | 37.6 | 57.4 | 3.46 | 1.91 | 199.0 |
| July 28 | do | 37.6 | 57.6 | 3.51 | 1.93 | 202.0 |
| Sept. 15 | do | 35.1 | 33.2 | 2.04 | 0.91 | 68.0 |

DAILY GAUGE HEIGHT AND DISCHARGE of Spray Creek at Spray Lakes, for 1915.

| Day. | June. | | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 3.90 | 516 | 1.98 | 209 | 1.20*a* | 99 | 0.94*a* | 70 |
| 2 | ..... | ..... | 3.85*a* | 508 | 1.98*a* | 209 | 1.18*a* | 97 | 0.93*a* | 69 |
| 3 | ..... | ..... | 3.80 | 500 | 1.99 | 210 | 1.16*a* | 94 | 0.92*a* | 68 |
| 4 | ..... | ..... | 3.83*a* | 505 | 1.94*a* | 203 | 1.14*a* | 92 | 0.91*a* | 67 |
| 5 | ..... | ..... | 3.85 | 508 | 1.90 | 197 | 1.11*a* | 88 | 0.90 | 66 |
| 6 | ..... | ..... | 3.84*a* | 506 | 1.85*a* | 190 | 1.09*a* | 86 | 0.85 | 62 |
| 7 | ..... | ..... | 3.84 | 506 | 1.80 | 182 | 1.07*a* | 84 | 0.82*a* | 59 |
| 8 | ..... | ..... | 3.84*a* | 506 | 1.76*a* | 176 | 1.05 | 82 | 0.79 | 56 |
| 9 | 1.35 | 117 | 3.84 | 506 | 1.72 | 170 | 1.04*a* | 80 | 0.79*a* | 56 |
| 10 | 1.35*a* | 117 | 3.82*a* | 503 | 1.66*a* | 161 | 1.04 | 80 | 0.78*a* | 55 |
| 11 | 1.34 | 116 | 3.84*a* | 506 | 1.60 | 152 | 1.00 | 76 | 0.78 | 55 |
| 12 | 1.50*a* | 137 | 3.86*a* | 510 | 1.53*a* | 141 | 0.97 | 73 | 0.78*a* | 55 |
| 13 | 1.63 | 156 | 3.84 | 506 | 1.45 | 131 | 0.95 | 71 | 0.77 | 55 |
| 14 | 1.74*a* | 173 | 3.85*a* | 508 | 1.43*a* | 128 | 0.93 | 69 | 0.77*a* | 55 |
| 15 | 1.85 | 190 | 3.86 | 510 | 1.40 | 124 | 0.92 | 68 | 0.76 | 54 |
| 16 | 1.94*a* | 203 | 3.83*a* | 505 | 1.40*a* | 124 | 0.92*a* | 68 | 0.76*a* | 54 |
| 17 | 2.02 | 215 | 3.80 | 500 | 1.39 | 123 | 0.91 | 67 | 0.75 | 53 |
| 18 | 2.02*a* | 215 | 3.84*a* | 506 | 1.47*a* | 133 | 0.92*a* | 68 | ..... | ..... |
| 19 | 2.02 | 215 | 3.72*a* | 487 | 1.56 | 146 | 0.94 | 70 | ..... | ..... |
| 20 | 2.08*a* | 225 | 3.78*a* | 497 | 1.56*a* | 146 | 0.94*a* | 70 | ..... | ..... |
| 21 | 2.12 | 231 | 3.64*a* | 474 | 1.55 | 145 | 0.95 | 71 | ..... | ..... |
| 22 | 2.21*a* | 246 | 3.30*a* | 420 | 1.49*a* | 136 | 0.95*a* | 71 | ..... | ..... |
| 23 | 2.30 | 260 | 3.06*a* | 382 | 1.43 | 128 | 0.95 | 71 | ..... | ..... |
| 24 | 2.33*a* | 265 | 2.74*a* | 330 | 1.37*a* | 120 | 0.95*a* | 71 | ..... | ..... |
| 25 | 2.35 | 268 | 2.40*a* | 276 | 1.30 | 111 | 0.96 | 72 | ..... | ..... |
| 26 | 2.70*a* | 324 | 2.22*a* | 247 | 1.28*a* | 109 | 0.95*a* | 71 | ..... | ..... |
| 27 | 3.05 | 380 | 2.07*a* | 223 | 1.25 | 105 | 0.94 | 70 | ..... | ..... |
| 28 | 3.60*a* | 468 | 1.93 | 201 | 1.25*a* | 105 | 0.94*a* | 70 | ..... | ..... |
| 29 | 3.95 | 524 | 1.97*a* | 207 | 1.24 | 104 | 0.94*a* | 70 | ..... | ..... |
| 30 | 3.92*a* | 519 | 2.00 | 212 | 1.22*a* | 101 | 0.94 | 70 | ..... | ..... |
| 31 | ..... | ..... | 2.00*a* | 212 | 1.21*a* | 100 | ..... | ..... | ..... | ..... |

*a* Gauge heights interpolated.

MONTHLY DISCHARGE of Spray Creek at Spray Lakes, for 1915.

(Drainage area 35 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| June (9–30) | 524 | 116 | 253 | 7.229 | 5.91 | 11,040 |
| July | 516 | 201 | 428 | 12.229 | 14.10 | 26,317 |
| August | 210 | 100 | 146 | 4.171 | 4.81 | 8,977 |
| September | 99 | 67 | 76 | 2.171 | 2.42 | 4,522 |
| October (1–17) | 70 | 53 | 59 | 1.686 | 1.07 | 1,989 |
| The period | ..... | ..... | ..... | ..... | 28.31 | 52,845 |

SPRAY RIVER NEAR BANFF.

*Location.*—On the SW. ¼ Sec. 25, Tp. 25, Rge. 12, W. 5th Mer., at the highway bridge near the Canadian Pacific Railway Banff Springs Hotel, near the junction of the stream with the Bow River.

*Records available.*—July 15, 1910, to December 31, 1915.

*Gauge.*—Chain on left bank. Elevation of zero maintained at 93.29 feet during 1910–11. Elevation of zero maintained at 88.71 feet during 1912–15.

*Bench-mark.*—Permanent iron bench-mark on the left bank. Assumed elevation, 100.00 feet.

*Channel.*—Permanent, gravel; large boulders at left bank pier.

*Discharge measurements.*—Made from a bridge.

*Floods.*—Maximum gauge height, June 26, 7.55 feet; stream in flood June 26 to end of month.

*Observer.*—N. B. Sanson.

DISCHARGE MEASUREMENTS of Spray River near Banff, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Feb. 22 | H. C. Ritchie | 27.5 | 68.2 | 2.63 | 5.46 | 179 |
| Mar. 5 | do | 27.5 | 59.0 | 3.02 | 5.33 | 179 |
| Mar. 22 | do | 38.5 | 57.8 | 3.01 | 4.65 | 174 |
| April 5 | do | 39.5 | 57.2 | 3.10 | 4.66 | 177 |
| April 21 | O. H. Hoover | 102.5 | 114.6 | 3.51 | 5.37 | 402 |
| May 10 | H. C. Ritchie | 117.5 | 205.6 | 4.61 | 6.15 | 948 |
| May 28 | do | 117.5 | 174.2 | 4.28 | 5.96 | 747 |
| June 8 | do | 117.5 | 196.8 | 4.77 | 6.19 | 939 |
| June 21 | do | 118.5 | 212.6 | 5.29 | 6.40 | 1,135 |
| July 3 | do | 121.5 | 288.0 | 6.36 | 7.20 | 1,843 |
| July 10 | do | 120.5 | 268.3 | 5.88 | 6.97 | 1,579 |
| July 22 | do | 119.5 | 253.6 | 5.33 | 6.75 | 1,352 |
| Aug. 9 | do | 118.0 | 216.0 | 4.65 | 6.40 | 995 |
| Aug. 28 | do | 117.5 | 174.5 | 4.03 | 6.05 | 704 |
| Oct. 4 | do | 113.5 | 127.6 | 3.31 | 5.52 | 423 |
| Oct. 23 | do | 92.5 | 98.6 | 3.20 | 5.25 | 315 |
| Nov. 5 | do | 89.5 | 96.2 | 3.33 | 5.20 | 320 |
| Nov. 16 | J. E. Caughey | 35.5 | 90.5 | 2.98 | 5.15 | 268 |
| Nov. 30 | do | 34.5 | 82.0 | 2.56 | 5.05 | 210 |
| Dec. 11 | do | 40.5 | 70.3 | 2.90 | 4.90 | 204 |
| Dec. 28 | H. C. Ritchie | 32.5 | 68.6 | 2.56 | 5.09 | 176 |

DAILY GAUGE HEIGHT AND DISCHARGE of Spray River near Banff, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 7.80*a* | 192 | 7.48 | 167 | 5.16 | 181 | 4.59 | 163 | 5.71 | 573 | 6.09 | 849 |
| 2 | 7.68*a* | 198 | 6.95 | 170 | 5.10 | 182 | 4.65 | 176 | 5.66*a* | 543 | 6.22 | 962 |
| 3 | 7.70*a* | 197 | 7.03 | 173 | 5.48 | 181 | 4.71 | 189 | 5.61 | 513 | 6.19 | 935 |
| 4 | 7.62*a* | 194 | 6.67 | 176 | 5.24 | 180 | 4.70*a* | 187 | 5.60 | 507 | 6.16 | 909 |
| 5 | 7.50*a* | 191 | 6.46 | 179 | 5.33 | 179 | 4.70 | 187 | 5.57 | 491 | 6.02 | 791 |
| 6 | 7.56*a* | 188 | 6.45 | 181 | 5.05 | 177 | 4.69 | 185 | 5.56 | 486 | 5.98*a* | 760 |
| 7 | 7.62*a* | 190 | 6.32*a* | 185 | 5.15*a* | 177 | 4.72 | 192 | 5.76 | 605 | 6.04*a* | 808 |
| 8 | 7.50*a* | 193 | 6.24 | 187 | 5.32 | 178 | 4.71 | 189 | 5.89 | 693 | 6.04*a* | 808 |
| 9 | 7.45*a* | 195 | 6.07 | 188 | 5.36 | 179 | 4.71 | 189 | 6.00*a* | 775 | 6.06*a* | 824 |
| 10 | 7.52*a* | 197 | 6.03 | 189 | 5.51 | 176 | 4.70 | 187 | 6.16 | 909 | 6.11 | 866 |
| 11 | 7.38*a* | 196 | 5.84 | 187 | 5.64 | 175 | 4.73*a* | 194 | 6.09 | 849 | 6.03 | 800 |
| 12 | 7.40*a* | 195 | 5.64 | 185 | 5.38 | 175 | 4.78 | 205 | 6.02 | 791 | 6.00 | 775 |
| 13 | 7.46 | 190 | 5.86 | 180 | 5.45 | 176 | 4.78 | 205 | 6.02 | 791 | 6.03*a* | 800 |
| 14 | 7.50 | 185 | 5.79*a* | 175 | 5.46*a* | 174 | 4.84 | 220 | 5.97 | 752 | 6.06 | 824 |
| 15 | 7.78 | 180 | 5.73 | 175 | 5.47 | 171 | 4.86 | 225 | 5.89 | 693 | 6.14 | 892 |
| 16 | 7.43 | 178 | 5.70 | 174 | 5.29 | 171 | 4.93 | 243 | 5.82*a* | 644 | 6.25 | 988 |
| 17 | 7.30 | 177 | 5.74 | 176 | 5.27 | 175 | 5.01 | 265 | 5.78 | 617 | 6.50 | 1,226 |
| 18 | 9.05 | 178 | 5.57 | 178 | 5.69 | 176 | 5.12*a* | 301 | 5.74 | 592 | 6.47 | 1,196 |
| 19 | 8.38 | 181 | 5.57 | 179 | 4.70 | 187 | 5.28 | 357 | 5.72 | 580 | 6.45 | 1,177 |
| 20 | 7.71 | 185 | 5.49 | 179 | 4.61 | 167 | 5.37 | 394 | 5.66 | 543 | 6.44*a* | 1,167 |
| 21 | 6.95 | 185 | 5.40*a* | 180 | 4.62*a* | 169 | 5.41 | 412 | 5.69 | 561 | 6.43 | 1,157 |
| 22 | 6.84 | 184 | 5.31 | 179 | 4.64 | 174 | 5.29 | 361 | 5.77 | 611 | 6.47 | 1,196 |
| 23 | 7.01 | 180 | 5.35 | 179 | 4.65 | 176 | 5.33 | 378 | 5.82*a* | 644 | 6.54 | 1,266 |
| 24 | 6.90*a* | 175 | 5.17 | 179 | 4.63 | 172 | 5.33 | 378 | 5.87 | 679 | 6.73 | 1,459 |
| 25 | 6.74 | 169 | 5.30 | 178 | 4.59 | 163 | 5.30*a* | 365 | 5.91 | 708 | 6.90 | 1,636 |
| 26 | 6.97 | 165 | 5.38 | 178 | 4.56 | 158 | 5.29 | 361 | 5.97 | 752 | 7.55 | 2,300 |
| 27 | 6.84 | 163 | 5.26 | 179 | 4.50 | 148 | 5.28 | 357 | 5.96 | 745 | 7.45 | 2,180 |
| 28 | 6.65*a* | 162 | 5.20*a* | 179 | 4.52 | 151 | 5.26 | 350 | 6.03 | 800 | 7.42 | 2,135 |
| 29 | 6.49 | 163 | ..... | ..... | 4.60 | 165 | 5.28 | 357 | 6.10 | 857 | 7.44 | 2,135 |
| 30 | 6.87 | 164 | ..... | ..... | 4.59 | 163 | 5.62 | 519 | 6.05*a* | 816 | 7.38 | 2,055 |
| 31 | 7.15*a* | 165 | ..... | ..... | 4.60 | 165 | ..... | ..... | 6.03 | 800 | ..... | ..... |

Jan. 1 to Mar. 18, winter conditions.
*a* Interpolated gauge height June 26 to July 3.

DAILY GAUGE HEIGHT AND DISCHARGE of Spray River near Banff, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 7.42 | 2,085 | 6.66 | 1,259 | 6.06 | 712 | 5.53 | 426 | 5.27 | 329 | 5.00 | 209 |
| 2 | 7.20 | 1,843 | 6.65 | 1,249 | 6.03 | 691 | 5.53 | 426 | 5.25 | 322 | 5.14 | 209 |
| 3 | 7.12 | 1,741 | 6.65 | 1,249 | 5.97 | 651 | 5.52*a* | 421 | 5.26 | 326 | 5.31 | 208 |
| 4 | 7.12*a* | 1,741 | 6.64 | 1,239 | 5.93 | 626 | 5.52 | 421 | 5.22 | 313 | 5.27 | 208 |
| 5 | 7.13 | 1,752 | 6.55 | 1,147 | 5.92*a* | 620 | 5.56 | 438 | 5.20 | 306 | 5.62*a* | 207 |
| 6 | 7.06 | 1,678 | 6.45 | 1,047 | 5.91 | 613 | 5.50 | 413 | 5.07 | 269 | 4.97 | 207 |
| 7 | 7.12 | 1,741 | 6.46 | 1,056 | 5.87 | 590 | 5.46 | 397 | 5.01*a* | 253 | 4.93 | 206 |
| 8 | 7.10 | 1,720 | 6.43 | 1,027 | 5.84 | 574 | 5.43 | 386 | 4.96 | 240 | 4.93 | 206 |
| 9 | 7.06 | 1,678 | 6.46 | 1,056 | 5.82 | 563 | 5.42 | 382 | 5.08 | 272 | 4.96 | 205 |
| 10 | 7.05 | 1,667 | 6.39 | 987 | 5.75 | 526 | 5.42 | 382 | 5.04 | 261 | 4.83 | 205 |
| 11 | 6.90*a* | 1,508 | 6.32 | 921 | 5.73 | 516 | 5.40 | 374 | 4.94 | 236 | 4.90 | 204 |
| 12 | 6.63 | 1,229 | 6.32 | 921 | 5.70*a* | 500 | 5.37 | 363 | 4.89 | 224 | 4.88*a* | 197 |
| 13 | 6.59 | 1,188 | 6.33 | 930 | 5.65 | 477 | 5.36 | 360 | 4.92 | 231 | 4.85 | 195 |
| 14 | 6.74 | 1,341 | 6.33 | 930 | 5.61 | 459 | 5.35 | 357 | 5.03*a* | 258 | 4.98 | 192 |
| 15 | 6.75 | 1,352 | 6.24 | 851 | 5.60 | 455 | 5.31 | 343 | 5.15 | 292 | 4.95 | 191 |
| 16 | 6.77 | 1,372 | 6.26 | 868 | 5.58 | 447 | 5.30 | 339 | 5.05 | 264 | 5.04 | 190 |
| 17 | 6.83 | 1,435 | 6.22 | 834 | 5.56 | 438 | 5.29 | 336 | 4.91*b* | 263 | 5.04 | 190 |
| 18 | 6.80*a* | 1,403 | 6.24 | 851 | 5.55 | 434 | 5.27 | 329 | 4.93 | 260 | 5.15 | 191 |
| 19 | 6.80 | 1,403 | 6.22 | 834 | 5.60*a* | 455 | 5.33 | 349 | 4.94 | 256 | 5.20*a* | 193 |
| 20 | 6.79*a* | 1,393 | 6.33 | 930 | 5.62 | 464 | 5.31 | 343 | 4.94 | 252 | 5.26 | 194 |
| 21 | 6.77 | 1,372 | 6.26 | 868 | 5.62 | 464 | 5.30 | 339 | 4.97*a* | 248 | 4.89 | 194 |
| 22 | 6.75 | 1,352 | 6.26 | 868 | 5.59 | 451 | 5.30 | 339 | 5.00 | 243 | 4.91 | 192 |
| 23 | 6.76 | 1,362 | 6.23 | 843 | 5.62 | 464 | 5.27 | 329 | 4.90 | 238 | 4.87 | 189 |
| 24 | 6.65 | 1,249 | 6.21 | 825 | 5.58 | 447 | 5.27 | 329 | 4.89 | 235 | 4.99 | 184 |
| 25 | 6.63 | 1,229 | 6.19 | 809 | 5.56 | 438 | 5.27 | 329 | 4.90 | 231 | 5.06 | 179 |
| 26 | 6.80 | 1,403 | 6.16 | 786 | 5.55*a* | 434 | 5.29 | 336 | 4.89 | 227 | 5.00 | 173 |
| 27 | 6.68 | 1,280 | 6.10 | 740 | 5.53 | 426 | 5.28 | 332 | 4.87 | 223 | 5.09 | 173 |
| 28 | 6.73 | 1,331 | 6.07 | 719 | 5.54 | 430 | 5.33 | 349 | 4.88*a* | 218 | 5.05 | 176 |
| 29 | 6.70 | 1,300 | 6.03 | 691 | 5.55 | 434 | 5.30 | 339 | 4.90 | 214 | 5.02 | 176 |
| 30 | 6.73 | 1,331 | 6.06 | 712 | 5.48 | 405 | 5.32 | 346 | 5.05 | 210 | 4.89 | 176 |
| 31 | 6.70 | 1,300 | 6.10 | 740 | ..... | ..... | 5.30*a* | 339 | ..... | ..... | 4.88*c* | 177 |

*a* Interpolated gauge height.
*b–c* Winter conditions.

MONTHLY DISCHARGE of Spray River near Banff, for 1915.

(Drainage area 295 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 198 | 162 | 182 | 0.617 | 0.71 | 11,191 |
| February | 189 | 167 | 179 | 0.607 | 0.63 | 9,941 |
| March | 187 | 148 | 172 | 0.583 | 0.67 | 10,576 |
| April | 519 | 163 | 276 | 0.936 | 1.04 | 16,423 |
| May | 909 | 486 | 675 | 2.290 | 2.64 | 41,504 |
| June | 2,300 | 760 | 1,196 | 4.050 | 4.52 | 71,180 |
| July | 2,085 | 1,188 | 1,477 | 5.010 | 5.78 | [illegible] |
| August | 1,259 | 691 | 929 | 3.150 | 3.63 | 57,122 |
| September | 712 | 405 | 507 | 1.720 | 1.92 | [illegible] |
| October | 426 | 329 | 364 | 1.230 | 1.42 | [illegible] |
| November | 329 | 210 | 257 | 0.871 | 0.97 | 15,285 |
| December | 209 | 173 | 193 | 0.654 | 0.75 | 11,887 |
| The year | .... | .... | .... | .... | 24.68 | 388,447 |

CASCADE RIVER AT BANKHEAD.

*Location.*—On the SE. ¼ Sec. 19, Tp. 26, Rge. 11, W. 5th Mer., at the Bankhead mines.

*Records available.*—Aug. 16, 1911, to December 31, 1915.

*Gauge.*—Vertical staff. Elevation of zero maintained at 93.49 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark on right bank. Assumed elevation, 100.00 feet.

*Channel.*—Fairly permanent, shifted during floods in June, 1915.

*Discharge measurements.*—Made from foot bridge to time of flood, since then, by wading owing to bridge being destroyed.

*Artificial control.*—This station is two and one-half miles below the reservoir of the Calgary Power Company at Lake Minnewanka near Bankhead mines water supply and the flow of the stream is controlled by the gates.

*Floods.*—Maximum gauge height June 26, 4.02 feet and June 28, 4.66 feet. Flood was on June 26, but owing to control at Lake Minnewanka being overlooked, the highest water was on June 28, when several stop logs at the control had to be blasted out with dynamite. This caused a rush of water in Cascade river and enlarged the stream bed in many places, including the gauging section. In some places the stream overflowed the banks.

*Observer.*—J. B. Mackinlay, Jan. 1 to July 31; W. E. Cowan, Aug. 31 to December 31.

DISCHARGE MEASUREMENTS of Cascade River at Bankhead, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 14 | H. C. Ritchie | 42.0 | 54.2 | 2.28 | 1.10 | 124 |
| Jan. 30 | do | 42.2 | 65.3 | 3.22 | 1.37 | 210 |
| Feb. 5 | do | 42.2 | 60.6 | 2.86 | 1.26 | 173 |
| Feb. 26 | do | 44.0 | 91.0 | 4.29 | 2.07 | 389 |
| Mar. 11 | do | 43.0 | 82.0 | 3.52 | 1.72 | 290 |
| Mar. 25 | do | 44.0 | 86.6 | 4.96 | 1.99 | 430 |
| April 10 | do | 42.8 | 74.4 | 3.70 | 1.50 | 276 |
| April 16 | do | 42.5 | 61.6 | 2.57 | 1.26 | 158 |
| April 27 | O. H. Hoover | 42.3 | 57.5 | 2.89 | 1.23 | 166 |
| May 11 | H. C. Ritchie | 41.5 | 37.3 | 1.28 | 0.74 | 48 |
| May 28 | do | 40.8 | 30.5 | 1.04 | 0.57 | 32 |
| June 10 | do | 44.8 | 94.2 | 4.98 | 2.24 | 469 |
| June 22 | do | 46.6 | 132.2 | 7.12 | 2.92 | 941 |
| Aug. 13 | do | 94.0 | 158.9 | 5.00 | 2.62 | 794 |
| Aug. 31 | do | 84.0 | 109.5 | 3.72 | 2.15 | 408 |
| Oct. 6 | do | 80.5 | 73.7 | 2.64 | 1.74 | 194 |
| Oct. 19 | do | 54.0 | 97.9 | 1.87 | 1.72 | 183 |
| Nov. 3 | do | 55.0 | 98.2 | 2.08 | 1.84 | 204 |
| Nov. 16 | J. E. Caughey | 79.0 | 124.7 | 1.98 | 1.90 | 247 |
| Dec. 1 | do | 70.0 | 113.5 | 1.75 | 1.63 | 198 |
| Dec. 13 | do | 74.0 | 103.0 | 1.73 | 1.60 | 179 |
| Dec. 31 | H. C. Ritchie | 61.0 | 110.0 | 1.52 | 2.51 | 168 |

Winter conditions Dec. 5–31.

DAILY GAUGE HEIGHT AND DISCHARGE of Cascade River at Bankhead, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.15 | 142 | 1.31 | 182 | 1.95 | 395 | 1.66 | 289 | 0.85 | 77.0 | 0.71 | 51 |
| 2 | 1.12 | 135 | 1.33 | 187 | 1.96 | 399 | 1.60 | 269 | 0.85 | 77.0 | 0.92 | 90 |
| 3 | 1.12 | 135 | 1.29 | 176 | 2.14 | 476 | 1.57 | 260 | 0.85 | 77.0 | 1.04 | 116 |
| 4 | 1.15 | 142 | 1.27 | 171 | 2.02 | 424 | 1.85 | 356 | 0.85 | 77.0 | 1.42 | 213 |
| 5 | 1.15 | 142 | 1.26 | 169 | 1.91 | 379 | 1.79 | 333 | 0.85 | 77.0 | 1.44 | 219 |
| 6 | 1.15 | 142 | 1.24 | 163 | 1.80 | 337 | 1.72 | 309 | 0.88 | 82.0 | 1.56 | 257 |
| 7 | 1.10 | 130 | 1.23 | 161 | 2.09 | 454 | 1.65 | 285 | 0.50 | 20.0 | 1.67 | 292 |
| 8 | 1.05 | 119 | 1.22 | 158 | 2.00 | 415 | 1.58 | 263 | 0.68 | 45.0 | 1.93 | 287 |
| 9 | 1.11 | 132 | 1.21 | 156 | 1.88 | 367 | 1.55 | 254 | 0.98 | 103.0 | 2.26 | 532 |
| 10 | 1.13 | 137 | 1.18 | 148 | 1.79 | 333 | 1.53 | 247 | 1.18 | 148.0 | 2.24 | 522 |
| 11 | 1.11 | 132 | 1.18 | 148 | 1.72 | 309 | 1.42 | 213 | 0.74 | 56.0 | 2.28 | 541 |
| 12 | 1.15 | 142 | 1.17 | 146 | 1.65 | 285 | 1.38 | 201 | 0.90 | 86.0 | 2.32 | 561 |
| 13 | 1.12 | 135 | 1.17 | 146 | 1.83 | 348 | 1.35 | 193 | 1.01 | 109.0 | 2.38 | 592 |
| 14 | 1.10 | 130 | 1.64 | 282 | 2.09 | 454 | 1.31 | 182 | 1.25 | 166.0 | 2.42 | 613 |
| 15 | 1.10 | 130 | 1.60 | 269 | 1.99 | 411 | 1.30 | 179 | 0.56 | 27.0 | 2.46 | 634 |
| 16 | 1.08 | 125 | 1.55 | 254 | 1.89 | 371 | 1.25 | 166 | 0.66 | 42.0 | 2.48 | 645 |
| 17 | 1.05 | 119 | 1.81 | 341 | 1.82 | 345 | 1.27 | 171 | 0.70 | 49.0 | 2.59 | 708 |
| 18 | 1.05 | 119 | 1.67 | 292 | 1.76 | 323 | 1.27 | 171 | 0.81 | 69.0 | 2.92 | 939 |
| 19 | 1.07 | 123 | 1.63 | 279 | 2.05 | 437 | 1.31 | 182 | 0.54 | 24.0 | 2.97 | 979 |
| 20 | 1.10 | 130 | 1.58 | 263 | 1.85 | 356 | 1.29 | 176 | 0.68 | 45.0 | 2.97 | 979 |
| 21 | 1.10 | 130 | 1.95 | 395 | 2.02 | 424 | 1.37 | 199 | 0.43 | 13.0 | 2.95 | 963 |
| 22 | 1.05 | 119 | 1.86 | 360 | 1.93 | 387 | 1.35 | 193 | 0.44 | 14.0 | 2.95 | 963 |
| 23 | 1.09 | 128 | 1.78 | 330 | 1.84 | 352 | 1.33 | 187 | 0.31 | 5.5 | 2.99 | 995 |
| 24 | 1.96 | 399 | 2.20 | 503 | 2.09 | 454 | 1.30 | 179 | 0.57 | 28.0 | 3.03 | 1,028 |
| 25 | 1.54 | 250 | 2.13 | 472 | 1.99 | 411 | 1.27 | 171 | 0.63 | 36.0 | 3.05 | 1,044 |
| 26 | 1.51 | 241 | 2.06 | 441 | 1.90 | 375 | 1.24 | 163 | 0.70 | 49.0 | 4.02 | 1,854 |
| 27 | 1.45 | 223 | 1.97 | 403 | 1.82 | 345 | 1.23 | 161 | 0.39 | 9.5 | 3.63 | 1,728 |
| 28 | 1.43 | 216 | 2.09 | 454 | 2.03 | 328 | 1.25 | 166 | 0.57 | 28.0 | 4.66 | 2,607 |
| 29 | 1.40 | 207 | ..... | ..... | 1.94 | 391 | 1.26 | 169 | 0.68 | 45.0 | 3.87 | 1,956 |
| 30 | 1.37 | 199 | ..... | ..... | 1.82 | 345 | 1.38 | 201 | 0.80 | 67.0 | 4.32 | 2,384 |
| 31 | 1.33 | 187 | ..... | ..... | 1.76 | 323 | ..... | ..... | 0.56 | 27.0 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Cascade River at Bankhead, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 4.20 | 2,270 | 3.04 | 1,168 | 2.15 | 411 | 1.67 | 165 | 1.85 | 242 | 1.65 | 157 |
| 2 | 4.20 | 2,270 | 3.04 | 1,168 | 2.19 | 437 | 1.65 | 157 | 1.85 | 242 | 1.64 | 154 |
| 3 | 4.10 | 2,175 | 3.05 | 1,178 | 2.24 | 472 | 1.68 | 169 | 1.85 | 242 | 1.63 | 150 |
| 4 | 4.00 | 2,080 | 3.02 | 1,149 | 2.00 | 318 | 1.68 | 169 | 1.81 | 223 | 1.61 | 143 |
| 5 | 3.88 | 1,966 | 2.99 | 1,121 | 1.99 | 313 | 1.74 | 193 | 1.84 | 237 | 1.61*a* | 145 |
| 6 | 3.77 | 1,861 | 2.80 | 950 | 2.00 | 318 | 1.75 | 197 | 1.83 | 232 | 1.62 | 147 |
| 7 | 3.74 | 1,833 | 2.68 | 842 | 2.01 | 324 | 1.76 | 201 | 1.83 | 232 | 1.61 | 150 |
| 8 | 3.69 | 1,785 | 2.65 | 815 | 2.05 | 348 | 1.69 | 172 | 1.83 | 232 | 1.61 | 152 |
| 9 | 3.59 | 1,690 | 2.77 | 923 | 2.05 | 348 | 1.69 | 172 | 1.82 | 227 | 1.63 | 158 |
| 10 | 3.15 | 1,273 | 2.72 | 878 | 2.06 | 354 | 1.69 | 172 | 1.83 | 232 | 1.82 | 164 |
| 11 | 3.15 | 1,273 | 2.70 | 860 | 2.04 | 342 | 1.69 | 172 | 1.82 | 227 | 1.63 | 171 |
| 12 | 3.10 | 1,225 | 2.70 | 860 | 2.04 | 342 | 1.69 | 172 | 1.89 | 260 | 1.62 | 177 |
| 13 | 3.05 | 1,178 | 2.61 | 780 | 1.62 | 146 | 1.70 | 176 | 1.86 | 246 | 1.61 | 179 |
| 14 | 3.04 | 1,168 | 2.62 | 789 | 1.58 | 132 | 1.70 | 176 | 1.85 | 242 | 1.61 | 178 |
| 15 | 3.03 | 1,158 | 2.56 | 736 | 1.59 | 136 | 1.70 | 176 | 1.94 | 286 | 1.60 | 178 |
| 16 | 3.03 | 1,158 | 2.55 | 727 | 1.59 | 136 | 1.70 | 176 | 1.89 | 260 | 1.60 | 178 |
| 17 | 3.05 | 1,178 | 2.83 | 977 | 1.58 | 132 | 1.71 | 180 | 1.89 | 260 | 1.60 | 178 |
| 18 | 3.08 | 1,206 | 2.74 | 896 | 1.59 | 136 | 1.71 | 180 | 1.87 | 251 | 1.60 | 176 |
| 19 | 3.13 | 1,253 | 2.74 | 896 | 1.63 | 150 | 1.71 | 180 | 1.88 | 256 | 1.59 | 175 |
| 20 | 3.14 | 1,263 | 3.05 | 1,178 | 1.65 | 157 | 1.86 | 246 | 1.86 | 246 | 1.59 | 175 |
| 21 | 3.15 | 1,273 | 3.05 | 1,178 | 1.67 | 165 | 1.86 | 246 | 1.82 | 227 | 1.59 | 175 |
| 22 | 3.15 | 1,273 | 1.94 | 286 | 1.71 | 180 | 1.85 | 242 | 1.85 | 242 | 1.59 | 174 |
| 23 | 3.15 | 1,273 | 2.04 | 342 | 1.61 | 143 | 1.85 | 242 | 1.84 | 237 | 1.59 | 173 |
| 24 | 3.15 | 1,273 | 2.05 | 348 | 1.61 | 143 | 1.85 | 242 | 1.84 | 237 | 1.59 | 170 |
| 25 | 3.12 | 1,244 | 2.08 | 366 | 1.63 | 150 | 1.84 | 237 | 1.81 | 223 | 1.59 | 170 |
| 26 | 3.15 | 1,273 | 2.05 | 348 | 1.64 | 154 | 1.84 | 237 | 1.81 | 223 | 1.78 | 172 |
| 27 | 3.10 | 1,225 | 2.09 | 372 | 1.75 | 197 | 1.84 | 237 | 1.83 | 232 | 1.75 | 180 |
| 28 | 3.05 | 1,178 | 2.10 | 378 | 1.64 | 154 | 1.85 | 242 | 1.83 | 232 | 1.61 | 180 |
| 29 | 3.04 | 1,168 | 2.11 | 385 | 1.65 | 157 | 1.85 | 242 | 1.77 | 205 | 1.80 | 160 |
| 30 | 3.04 | 1,168 | 2.11 | 385 | 1.65 | 157 | 1.85 | 242 | 1.78 | 210 | 2.32 | 152 |
| 31 | 3.02 | 1,149 | 2.14 | 404 | ..... | ..... | 1.86 | 246 | ..... | ..... | 2.59*b* | 168 |

*a–b* Winter conditions.

MONTHLY DISCHARGE of Cascade River at Bankhead, for 1915.

(Drainage area 244 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 399 | 119.0 | 159 | 0.652 | 0.75 | 9,777 |
| February | 503 | 146.0 | 266 | 1.090 | 1.14 | 14,773 |
| March | 476 | 285.0 | 379 | 1.550 | 1.79 | 23;304 |
| April | 356 | 161.0 | 216 | 0.885 | 0.99 | 12,853 |
| May | 166 | 5.5 | 57 | 0.234 | 0.27 | 3,505 |
| June | 2,607 | 51.0 | 843 | 3.460 | 3.86 | 50,162 |
| July | 2,270 | 1,149.0 | 1,444 | 5.920 | 6.82 | 88,790 |
| August | 1,178 | 286.0 | 764 | 3.130 | 3.61 | 46,977 |
| September | 472 | 132.0 | 235 | 0.963 | 1.07 | 13,983 |
| October | 246 | 157.0 | 202 | 0.828 | 0.95 | 12,420 |
| November | 286 | 205.0 | 238 | 0.976 | 1.09 | 14,162 |
| December | 180 | 143.0 | 166 | 0.680 | 0.78 | 10,207 |
| The year | ..... | ..... | ..... | ..... | 23.12 | 300,913 |

BOW RIVER NEAR KANANASKIS.

*Location.*—On the NW. ¼ Sec. 32, Tp. 24, Rge. 8, W. 5th Mer., at the Canadian Pacific Railway bridge, one mile above the Kananaskis Falls dam of the Calgary Power Company.

*Records available.*—March 10, 1912, to December 31, 1915. Records obtained at Morley, ten miles downstream, from May 25, 1910, to November 30, 1911.

*Gauge.*—Chain. Elevation of zero maintained at 90.84 feet since establishment.

PLATE 18

Bow River in flood at Calgary, on July 5, 1902. Looking northeast. Note Mr. Birnie's residence again. Water washed the door-step on this occasion.

PLATE 19

Bow River in flood at Calgary, on July 5, 1902. Looking north from right bank. Note the water in front of the approach to Langevin bridge. This photograph was also given to us by Mr. Tom Birnie.

*Bench-mark.*—On side of east pier. Assumed elevation, 100.00 feet.

*Channel.*—Permanent, solid rock, fairly uniform.

*Discharge measurements.*—Made from a bridge at very low stages by wading.

*Floods.*—Stream was in flood June 28, gauge height, 4.90 feet. Stream did not overflow banks.

*Observer.*—The Calgary Power Company.

DISCHARGE MEASUREMENTS of Bow River near Kananaskis, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 5 | H. C. Ritchie | 361.0 | 410.7 | 1.80 | 3.45 | 738 |
| Feb. 16 | do | 363.0 | 557.5 | 1.44 | 3.79 | 804 |
| Mar. 2 | do | 351.0 | 351.0 | 2.29 | 1.96 | 804 |
| Mar. 18 | do | 353.0 | 349.8 | 2.42 | 1.96 | 846 |
| April 1 | do | 354.0 | 337.8 | 2.26 | 1.95 | 762 |
| April 13 | do | 354.0 | 336.8 | 2.42 | 1.95 | 814 |
| May 4 and 5 | do | 381.0 | 515.3 | 3.63 | 2.43 | 1,873 |
| May 18 | do | 385.0 | 597.3 | 4.02 | 2.57 | 2,401 |
| June 2 | do | 402.0 | 706.3 | 4.91 | 2.85 | 3,472 |
| June 16 | do | 403.0 | 777.0 | 5.29 | 3.14 | 4,112 |
| June 29 | do | 427.0 | 1,477.0 | 8.41 | 4.79 | 12,422 |
| July 5 | do | 422.5 | 1,348.0 | 7.56 | 4.52 | 10,193 |
| July 7 | do | 423.5 | 1,307.4 | 7.10 | 4.44 | 9,282 |
| July 16 | do | 414.0 | 1,081.2 | 6.88 | 3.87 | 7,436 |
| Aug. 3 | do | 414.0 | 1,080.4 | 5.96 | 3.86 | 6,434 |
| Aug. 24 | do | 406.0 | 867.4 | 5.64 | 3.24 | 4,896 |
| Sept. 24 | do | 382.0 | 534.0 | 3.73 | 2.46 | 1,993 |
| Oct. 14 | do | 382.0 | 542.4 | 3.46 | 2.42 | 1,977 |
| Oct. 27 | do | 373.0 | 462.8 | 3.23 | 2.40 | 1,494 |
| Nov. 23 | J. E. Caughey | 415.0 | 1,210.0 | 1.14 | 4.53 | 1,380 |
| Dec. 21 | H. C. Ritchie | 240.0 | 732.0 | 1.63 | 5.09 | 1,193 |

DAILY GAUGE HEIGHT AND DISCHARGE of Bow River near Kananaskis, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.75*a* | 740 | 4.03 | 630 | 1.99*a* | 805 | 1.95 | 800 | 2.44 | 1,980 | 2.89 | 3,426 |
| 2 | 3.89 | 798 | 4.26 | 715 | 1.97 | 836 | 1.92 | 746 | 2.45 | 2,010 | 2.86 | 3,324 |
| 3 | 3.61 | 816 | 4.57 | 750 | 2.01 | 911 | 1.92 | 746 | 2.42 | 1,920 | 2.88 | 3,392 |
| 4 | 3.55 | 780 | 4.39 | 790 | 2.04 | 974 | 1.91 | 728 | 2.40 | 1,860 | 2.85 | 3,290 |
| 5 | 3.52 | 738 | 4.22 | 820 | 2.04 | 974 | 1.96 | 818 | 2.46 | 2,040 | 2.88 | 3,392 |
| 6 | 3.35 | 730 | 4.24 | 850 | 2.00 | 890 | 1.96 | 818 | 2.48 | 2,100 | 2.89 | 3,426 |
| 7 | 3.39 | 760 | 4.15 | 870 | 1.90 | 710 | 1.95 | 800 | 2.49 | 2,130 | 2.90 | 3,460 |
| 8 | 3.50 | 780 | 4.15 | 880 | 1.92 | 746 | 1.95 | 800 | 2.47 | 2,070 | 2.92 | 3,530 |
| 9 | 3.52 | 785 | 4.10 | 870 | 1.91 | 728 | 1.98 | 854 | 2.55 | 2,315 | 3.07 | 4,055 |
| 10 | 3.47 | 780 | 4.04 | 855 | 1.92 | 746 | 1.94 | 782 | 2.81 | 3,154 | 3.04 | 3,950 |
| 11 | 3.50 | 770 | 3.94 | 840 | 1.90 | 710 | 1.95 | 800 | 2.82 | 3,188 | 2.94 | 3,600 |
| 12 | 3.54 | 710 | 3.77 | 820 | 1.88 | 678 | 1.95 | 800 | 2.84 | 3,250 | 2.87 | 3,358 |
| 13 | 3.52 | 605 | 3.73 | 800 | 1.87 | 662 | 1.95 | 800 | 2.90 | 3,460 | 2.86 | 3,324 |
| 14 | 3.46 | 580 | 3.50 | 780 | 1.90 | 710 | 1.96 | 818 | 2.96 | 3,670 | 2.87 | 3,358 |
| 15 | 3.76 | 600 | 3.69 | 790 | 1.95 | 800 | 1.96 | 818 | 2.81 | 3,154 | 3.14 | 4,304 |
| 16 | 3.70 | 660 | 3.76 | 805 | 1.95 | 800 | 1.94 | 782 | 2.65 | 2,630 | 3.10 | 4,160 |
| 17 | 3.90 | 720 | 3.71 | 820 | 1.89 | 694 | 2.02 | 932 | 2.59 | 2,430 | 3.17 | 4,412 |
| 18 | 3.94 | 715 | 3.32 | 810 | 1.97 | 836 | 2.06 | 1,016 | 2.56 | 2,346 | 3.58 | 5,888 |
| 19 | 3.90 | 700 | 3.14 | 800 | 1.93 | 764 | 2.13 | 1,172 | 2.59 | 2,430 | 3.50 | 5,600 |
| 20 | 3.97 | 620 | 2.82 | 795 | 1.94 | 782 | 2.25 | 1,465 | 2.54 | 2,284 | 3.48 | 5,528 |
| 21 | 3.93 | 595 | 2.47 | 795 | 1.92 | 746 | 2.28 | 1,540 | 2.50 | 2,160 | 3.44 | 5,384 |
| 22 | 3.70 | 560 | 2.66 | 795 | 1.94 | 782 | 2.29 | 1,565 | 2.55 | 2,315 | 3.45 | 5,420 |
| 23 | 3.67 | 540 | 2.57 | 795 | 2.01 | 911 | 2.30 | 1,590 | 2.56 | 2,346 | 3.45 | 5,420 |
| 24 | 3.80 | 530 | 2.19 | 800 | 1.99 | 872 | 2.28 | 1,540 | 2.56 | 2,346 | 3.47 | 5,492 |
| 25 | 3.76 | 520 | 2.13 | 800 | 1.97 | 836 | 2.25 | 1,465 | 2.58 | 2,408 | 3.61 | 5,936 |
| 26 | 3.79 | 505 | 2.08 | 800 | 2.15 | 1,220 | 2.28 | 1,540 | 2.66 | 2,662 | 4.24 | 8,462 |
| 27 | 3.72 | 500 | 2.06 | 800 | 2.21 | 1,365 | 2.25 | 1,465 | 2.67 | 2,694 | 4.53 | 10,470 |
| 28 | 3.75 | 510 | 2.00 | 800 | 1.90 | 710 | 2.25 | 1,465 | 2.68 | 2,726 | 4.90 | 14,780 |
| 29 | 3.71 | 520 | | | 1.95 | 800 | 2.29 | 1,565 | 2.76 | 2,988 | 4.84 | 14,[illegible] |
| 30 | 3.76 | 540 | | | 1.94 | 782 | 2.36 | 1,757 | 2.84 | 3,250 | 4.65 | 11,[illegible] |
| 31 | 3.81 | 575 | | | 1.94 | 782 | | | 2.86 | 3,324 | | |

*a* Ice conditions Jan. 1 to Mar. 1.

DAILY GAUGE HEIGHT AND DISCHARGE of Bow River near Kananaskis, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 4.83 | 12,898 | 3.76 | 6,542 | 3.09 | 4,125 | 2.39 | 1,833 | 2.39 | 1,833 | 4.80 | 1,370 |
| 2 | 4.84 | 13,024 | 3.76 | 6,542 | 3.04 | 3,950 | 2.39 | 1,833 | 2.40 | 1,860 | 4.87 | 1,325 |
| 3 | 4.86 | 13,276 | 3.84 | 6,838 | 3.00 | 3,810 | 2.38 | 1,806 | 2.36 | 1,752 | 5.05 | 1,305 |
| 4 | 4.35 | 9,030 | 3.85 | 6,875 | 2.98 | 3,740 | 2.39 | 1,833 | 2.32 | 1,644 | 5.03 | 1,295 |
| 5 | 4.48 | 9,744 | 3.42 | 5,312 | 2.96 | 3,670 | 2.40 | 1,860 | 2.27 | 1,515 | 4.90 | 1,280 |
| 6 | 4.44 | 9,512 | 3.39 | 5,204 | 2.92 | 3,530 | 2.40 | 1,860 | 2.25 | 1,465 | 4.80 | 1,250 |
| 7 | 4.44 | 9,512 | 3.35 | 5,060 | 2.81 | 3,154 | 2.39 | 1,833 | 2.19 | 1,316 | 4.50 | 1,225 |
| 8 | 4.36 | 9,080 | 3.32 | 4,952 | 2.78 | 3,054 | 2.43 | 1,950 | 2.16 | 1,244 | 4.35 | 1,210 |
| 9 | 4.32 | 8,880 | 3.29 | 4,844 | 2.71 | 2,823 | 2.45 | 2,010 | 2.15 | 1,220 | 4.34 | 1,200 |
| 10 | 4.30 | 8,780 | 3.28 | 4,808 | 2.69 | 2,758 | 2.45 | 2,010 | 2.19 | 1,316 | 4.32 | 1,195 |
| 11 | 4.25 | 8,540 | 3.29 | 4,844 | 2.68 | 2,726 | 2.44 | 1,980 | 2.17 | 1,268 | 4.32 | 1,190 |
| 12 | 4.15 | 8,090 | 3.31 | 4,916 | 2.67 | 2,694 | 2.43 | 1,950 | 2.16 | 1,244 | 4.30 | 1,195 |
| 13 | 3.85 | 6,875 | 3.33 | 4,988 | 2.61 | 2,502 | 2.43 | 1,950 | 2.16 | 1,244 | 4.29 | 1,200 |
| 14 | 3.59 | 5,924 | 3.35 | 5,060 | 2.57 | 2,377 | 2.41 | 1,890 | 2.20*a* | 1,253 | 4.28 | 1,200 |
| 15 | 3.91 | 7,100 | 3.38 | 5,168 | 2.51 | 2,191 | 2.41 | 1,890 | 2.30 | 1,260 | 4.29 | 1,205 |
| 16 | 3.86 | 6,912 | 3.41 | 5,276 | 2.44 | 1,980 | 2.40 | 1,860 | 2.50 | 1,280 | 4.28 | 1,210 |
| 17 | 3.89 | 7,023 | 3.39 | 5,204 | 2.41 | 1,890 | 2.39 | 1,833 | 3.00 | 1,310 | 4.28 | 1,210 |
| 18 | 3.88 | 6,986 | 3.38 | 5,168 | 2.42 | 1,920 | 2.39 | 1,833 | 3.50 | 1,340 | 4.35 | 1,205 |
| 19 | 3.87 | 6,949 | 3.37 | 5,132 | 2.46 | 2,040 | 2.40 | 1,860 | 3.90 | 1,350 | 4.47 | 1,200 |
| 20 | 3.88 | 6,986 | 3.50 | 5,600 | 2.44 | 1,980 | 2.40 | 1,860 | 4.20 | 1,360 | 4.56 | 1,200 |
| 21 | 3.85 | 6,875 | 3.48 | 5,528 | 2.43 | 1,950 | 2.39 | 1,833 | 4.35*a* | 1,375 | 5.12 | 1,195 |
| 22 | 3.90 | 7,060 | 3.40 | 5,240 | 2.40 | 1,860 | 2.38 | 1,806 | 4.55 | 1,380 | 4.60 | 1,190 |
| 23 | 3.91 | 7,100 | 3.37 | 5,132 | 2.39 | 1,833 | 2.37 | 1,779 | 4.55 | 1,380 | 4.56 | 1,175 |
| 24 | 3.89 | 7,023 | 3.21 | 4,556 | 2.46 | 2,040 | 2.36 | 1,752 | 4.56 | 1,375 | 4.58 | 1,140 |
| 25 | 3.88 | 6,986 | 3.19 | 4,484 | 2.45 | 2,010 | 2.36 | 1,752 | 4.55 | 1,370 | 4.57 | 1,060 |
| 26 | 3.89 | 7,023 | 3.17 | 4,412 | 2.43 | 1,950 | 2.35 | 1,725 | 4.54 | 1,370 | 4.50 | 990 |
| 27 | 3.77 | 6,579 | 3.14 | 4,304 | 2.42 | 1,920 | 2.40 | 1,860 | 4.55 | 1,370 | 4.51 | 985 |
| 28 | 3.75 | 6,505 | 3.13 | 4,268 | 2.41 | 1,890 | 2.39 | 1,833 | 4.55 | 1,375 | 4.35 | 980 |
| 29 | 3.75 | 6,505 | 3.14 | 4,304 | 2.42 | 1,920 | 2.39 | 1,833 | 4.58 | 1,380 | 4.36 | 960 |
| 30 | 3.76 | 6,542 | 3.15 | 4,340 | 2.41 | 1,890 | 2.38 | 1,806 | 4.63 | 1,380 | 4.30 | 910 |
| 31 | 3.75 | 6,505 | 3.13 | 4,268 | ..... | ..... | 2.38 | 1,806 | ..... | ..... | 4.24 | 865 |

*a–a* Gauge heights interpolated.

MONTHLY DISCHARGE of Bow River near Kananaskis, for 1915.

(Drainage area 1631 square miles).

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 816 | 500 | 654 | 0.401 | 0.46 | 40,213 |
| February | 880 | 630 | 803 | 0.492 | 0.51 | 44,596 |
| March | 1,365 | 662 | 825 | 0.506 | 0.58 | 50,727 |
| April | 1,752 | 728 | 1,093 | 0.670 | 0.75 | 65,040 |
| May | 3,670 | 1,860 | 2,570 | 1.580 | 1.82 | 158,020 |
| June | 13,780 | 3,290 | 5,428 | 3.330 | 3.72 | 322,990 |
| July | 13,276 | 5,924 | 8,059 | 4.940 | 5.70 | 495,530 |
| August | 6,875 | 4,268 | 5,134 | 3.150 | 3.63 | 315,680 |
| September | 4,125 | 1,833 | 2,539 | 1.560 | 1.74 | 151,080 |
| October | 2,010 | 1,725 | 1,855 | 1.140 | 1.31 | 114,060 |
| November | 1,833 | 1,220 | 1,394 | 0.855 | 0.95 | 82,949 |
| December | 1,370 | 865 | 1,165 | 0.714 | 0.82 | 71,633 |
| The year | ..... | ..... | ..... | ..... | 21.99 | 1,912,518 |

KANANASKIS RIVER NEAR SEEBE.

*Location.*—On the SW. ¼ Sec. 34, Tp. 24, Rge. 8, W. 5th Mer., one and one-half miles above the junction with the Bow River.

*Records available.*—Sept. 1, 1911, to November 11, 1911; January 1, 1912, to December 31, 1915.

*Gauge.*—Chain. Elevation of zero maintained at 88.17 feet since April 20, 1912. Previous to April 20, 1912, gauge readings are at old station one and one-half miles downstream.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.
*Channel.*—Permanent.
*Discharge measurements.*—Made from a cable.
*Observer.*—The Calgary Power Company.

DISCHARGE MEASUREMENTS of Kananaskis River near Seebe, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 4 | H. C. Ritchie | 30.0 | 71.8 | 1.71 | 6.48 | 123 |
| Jan. 20 | do | 40.0 | 61.5 | 1.45 | 5.66 | 89 |
| Feb. 15 | do | 20.0 | 72.0 | 2.12 | 10.03 | 152 |
| Mar. 3 | do | 25.0 | 77.8 | 1.85 | 7.17 | 144 |
| Mar 17 | do | 100.0 | 185.7 | 0.76 | 4.68 | 142 |
| Mar. 31 | do | 102.0 | 178.4 | 0.71 | 4.57 | 126 |
| April 12 | do | 103.0 | 188.8 | 0.82 | 4.68 | 155 |
| May 3 | do | 114.0 | 270.2 | 1.81 | 5.50 | 489 |
| May 17 | do | 118.0 | 325.4 | 2.61 | 5.91 | 850 |
| May 31 | do | 122.0 | 361.8 | 3.13 | 6.22 | 1,131 |
| June 15 | do | 124.0 | 383.0 | 3.58 | 6.38 | 1,372 |
| June 30 | do | 128.0 | 562.8 | 5.82 | 7.54 | 3,275 |
| July 6 | do | 127.5 | 503.4 | 4.62 | 7.11 | 2,326 |
| July 8 | do | 127.5 | 506.1 | 4.45 | 7.08 | 2,351 |
| July 15 | do | 125.5 | 437.4 | 3.99 | 6.63 | 1,745 |
| Aug. 4 | do | 125.0 | 432.0 | 3.86 | 6.60 | 1,668 |
| Aug. 25 | do | 121.0 | 384.2 | 3.31 | 6.28 | 1,271 |
| Sept. 24 | do | 120.0 | 321.1 | 2.13 | 5.75 | 685 |
| Oct. 15 | do | 116.0 | 271.4 | 1.55 | 5.36 | 421 |
| Oct. 26 | do | 109.0 | 257.6 | 1.44 | 5.27 | 372 |
| Nov. 8 | do | 113.0 | 248.9 | 1.30 | 5.16 | 324 |
| Nov. 20 | J. E. Caughey | 110.0 | 259.5 | 1.11 | 5.15 | 288 |
| Dec. 6 | do | 108.0 | 230.4 | 1.22 | 5.05 | 282 |

DAILY GAUGE HEIGHT AND DISCHARGE of Kananaskis River, near Seebe for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 6.34 | 119 | .....*a* | 97 | 7.30 | 148 | 4.56 | 128 | 5.41 | 461 | 6.24 | 1,188 |
| 2 | 6.54 | 123 | 10.24 | 105 | 7.15 | 145 | 4.58 | 134 | 5.45 | 487 | 6.32 | 1,284 |
| 3 | 6.39 | 120 | 10.50 | 111 | 7.17 | 144 | 4.60 | 140 | 5.48 | 507 | 6.34 | 1,308 |
| 4 | 6.48 | 123 | 9.70 | 120 | 7.00 | 144 | 4.59 | 137 | 5.50 | 520 | 6.31 | 1,272 |
| 5 | 6.09 | 120 | 9.33 | 125 | 7.08 | 144 | 4.60 | 140 | 5.52 | 534 | 6.33 | 1,296 |
| 6 | 6.76 | 115 | 9.48 | 131 | 6.69 | 143 | 4.58 | 134 | 5.53 | 541 | 6.34 | 1,308 |
| 7 | 6.49 | 112 | 9.46 | 137 | 6.87 | 143 | 4.60 | 140 | 5.71 | 678 | 6.35 | 1,320 |
| 8 | 6.36 | 109 | 9.07 | 143 | 6.87 | 142 | 4.62 | 146 | 6.13 | 1,067 | 6.36 | 1,332 |
| 9 | 6.33 | 107 | 9.14 | 148 | 6.07 | 142 | 4.62 | 146 | 6.21 | 1,152 | 6.36 | 1,332 |
| 10 | 6.05 | 105 | 8.95 | 152 | 5.30 | 143 | 4.64 | 152 | 6.21 | 1,152 | 6.23 | 1,176 |
| 11 | 6.04 | 102 | 8.60 | 155 | 4.53*a* | 142 | 4.64 | 152 | 6.20 | 1,140 | 6.19 | 1,130 |
| 12 | 6.06 | 100 | 8.34 | 155 | 4.55 | 125 | 4.63 | 149 | 6.13 | 1,067 | 6.20 | 1,140 |
| 13 | 5.97 | 98 | 8.66 | 149 | 4.54 | 122 | 4.65 | 155 | 6.06 | 995 | 6.17 | 1,109 |
| 14 | 6.18 | 97 | 8.57 | 142 | 4.51 | 113 | 4.68 | 164 | 6.16 | 1,098 | 6.24 | 1,188 |
| 15 | 5.75 | 95 | 9.40 | 152 | 4.49 | 107 | 4.68 | 164 | 6.07 | 1,005 | 6.38 | 1,356 |
| 16 | 6.20 | 94 | 9.36 | 158 | 4.54 | 122 | 4.74 | 172 | 5.99 | 925 | 6.36 | 1,332 |
| 17 | 5.96 | 93 | 9.32 | 162 | 4.53 | 119 | 4.78 | 184 | 5.92 | 859 | 6.67 | 1,747 |
| 18 | 5.70 | 92 | 9.07 | 163 | 4.56 | 128 | 4.81 | 193 | 5.91 | 850 | 6.70 | 1,790 |
| 19 | 5.63 | 89 | 8.99 | 163 | 4.58 | 134 | 4.88 | 214 | 5.89 | 841 | 6.64 | 1,703 |
| 20 | 5.66 | 89 | 8.76 | 162 | 4.57 | 131 | 4.96 | 241 | 5.81 | 759 | 6.64 | 1,703 |
| 21 | 5.42 | 86 | 8.35 | 160 | 4.58 | 134 | 5.00 | 255 | 5.84 | 786 | 6.64 | 1,703 |
| 22 | 8.30 | 83 | 8.60 | 157 | 4.57 | 131 | 4.98 | 248 | 5.88 | 822 | 6.63 | 1,689 |
| 23 | 10.05 | 80 | 8.15 | 155 | 4.57 | 131 | 5.00 | 255 | 5.96 | 897 | 6.63 | 1,689 |
| 24 | .....*a* | 78 | 7.62 | 154 | 4.56 | 128 | 5.01 | 259 | 6.09 | 1,025 | 6.74 | 1,850 |
| 25 | .....*a* | 76 | 7.33 | 153 | 4.58 | 134 | 5.04 | 273 | 6.16 | 1,098 | 6.95 | 2,175 |
| 26 | .....*a* | 75 | 7.19 | 151 | 4.71 | 163 | 5.04 | 273 | 6.22 | 1,164 | 8.23 | 4,708 |
| 27 | .....*a* | 77 | 7.24 | 150 | 4.59 | 137 | 5.05 | 277 | 6.29 | 1,164 | 8.55 | 5,480 |
| 28 | .....*a* | 79 | 7.12 | 149 | 4.52 | 116 | 5.06 | 282 | 6.27 | 1,224 | 7.80 | 3,805 |
| 29 | .....*a* | 80 | ..... | ..... | 4.54 | 122 | 5.09 | 296 | 6.34 | 1,296 | 7.65 | 3,480 |
| 30 | .....*a* | 85 | ..... | ..... | 4.54 | 122 | 5.27 | 383 | 6.30 | 1,260 | 7.55 | 3,280 |
| 31 | .....*a* | 90 | ..... | ..... | 4.57 | 131 | ..... | ..... | 6.24 | 1,188 | | |

*a* Gauge under jam.

DAILY GAUGE HEIGHT AND DISCHARGE of Kananaskis River near Seebe, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 7.52 | 3,217 | 6.60 | 1,645 | 6.18 | 1,119 | 5.65 | 630 | 5.29 | 394 | 5.50 | 298 |
| 2 | 7.30 | 2,790 | 6.58 | 1,617 | 6.16 | 1,098 | 5.64 | 622 | 5.30 | 400 | 5.53 | 295 |
| 3 | 7.24 | 2,679 | 6.57 | 1,603 | 6.13 | 1,067 | 5.64 | 622 | 5.29 | 394 | 5.52 | 291 |
| 4 | 7.10 | 2,430 | 6.58 | 1,617 | 6.12 | 1,056 | 5.63 | 614 | 5.27 | 383 | 5.48 | 286 |
| 5 | 7.05 | 2,345 | 6.57 | 1,603 | 6.10 | 1,035 | 5.61 | 598 | 5.25 | 373 | 5.20 | 283 |
| 6 | 7.14 | 2,500 | 6.56 | 1,589 | 6.07 | 1,005 | 5.60 | 590 | 5.25 | 373 | 5.06 | 282 |
| 7 | 7.20 | 2,605 | 6.53 | 1,547 | 6.05 | 985 | 5.58 | 576 | 5.20 | 345 | 5.04 | 283 |
| 8 | 7.08 | 2,396 | 6.50 | 1,505 | 5.96 | 897 | 5.57 | 569 | 5.16 | 327 | 5.07 | 284 |
| 9 | 7.04 | 2,328 | 6.45 | 1,442 | 5.94 | 878 | 5.54 | 548 | 5.14 | 318 | 5.09 | 281 |
| 10 | 7.01 | 2,277 | 6.43 | 1,418 | 5.92 | 859 | 5.51 | 527 | 2.18 | 336 | 5.20 | 278 |
| 11 | 7.00 | 2,260 | 6.40 | 1,380 | 5.91 | 850 | 5.48 | 507 | 5.17 | 332 | 5.31 | 278 |
| 12 | 6.90 | 2,090 | 6.38 | 1,356 | 5.89 | 831 | 5.46 | 494 | 5.16 | 327 | 5.49 | 277 |
| 13 | 6.82 | 1,970 | 6.36 | 1,332 | 5.84 | 786 | 5.43 | 475 | 5.16 | 327 | 5.70 | 277 |
| 14 | 6.76 | 1,880 | 6.34 | 1,308 | 5.81 | 759 | 5.39 | 449 | 5.14 | 318 | 5.75 | 276 |
| 15 | 6.75 | 1,865 | 6.31 | 1,272 | 5.78 | 734 | 5.38 | 444 | 5.13 | 314 | 5.74 | 277 |
| 16 | 6.56 | 1,589 | 6.30 | 1,260 | 5.75 | 710 | 5.38 | 444 | 5.13 | 314 | 5.75 | 276 |
| 17 | 6.58 | 1,617 | 6.28 | 1,236 | 5.74 | 702 | 5.37 | 438 | 5.12 | 309 | 5.77 | 275 |
| 18 | 6.58 | 1,617 | 6.27 | 1,224 | 5.74 | 702 | 5.36 | 433 | 5.11 | 304 | 5.79 | 274 |
| 19 | 6.57 | 1,603 | 6.26 | 1,212 | 5.75 | 710 | 5.37 | 438 | 5.12 | 309 | 5.87 | 273 |
| 20 | 6.56 | 1,589 | 6.54 | 1,561 | 5.74 | 702 | 5.36 | 433 | 5.10 | 300 | 5.93 | 273 |
| 21 | 6.60 | 1,645 | 6.50 | 1,505 | 5.75 | 710 | 5.34 | 422 | 5.10 | 300 | 6.60 | 271 |
| 22 | 6.64 | 1,703 | 6.35 | 1,320 | 5.74 | 702 | 5.32 | 411 | 5.10 | 300 | 6.20 | 266 |
| 23 | 6.63 | 1,689 | 6.32 | 1,284 | 5.73 | 694 | 5.30 | 400 | 5.09 | 296 | 6.24 | 261 |
| 24 | 6.62 | 1,674 | 6.28 | 1,236 | 5.76 | 718 | 5.29 | 394 | 5.10 | 300 | 6.30 | 253 |
| 25 | 6.67 | 1,747 | 6.27 | 1,224 | 5.74 | 702 | 5.28 | 389 | 5.12 | 309 | 6.22 | 245 |
| 26 | 6.66 | 1,732 | 6.25 | 1,200 | 5.72 | 686 | 5.27 | 383 | 5.19 | 310*b* | 6.20 | 240 |
| 27 | 6.64 | 1,703 | 6.22 | 1,164 | 5.70 | 670 | 5.28 | 389 | 5.23 | 310 | 6.26 | 235 |
| 28 | 6.65 | 1,717 | 6.22 | 1,164 | 5.69 | 662 | 5.34 | 422 | 5.29 | 306 | 6.20 | 230 |
| 29 | 6.65 | 1,717 | 6.21 | 1,152 | 5.69 | 662 | 5.32 | 411 | 5.37 | 304 | 6.37*a* | 224 |
| 30 | 6.63 | 1,689 | 6.21 | 1,152 | 5.67 | 646 | 5.30 | 400 | 5.40 | 302 | 6.54*a* | 215 |
| 31 | 6.61 | 1,659 | 6.18 | 1,119 | ..... | ..... | 5.30 | 400 | ..... | ..... | 6.71*a* | 204*b* |

*a* Gauge heights interpolated.
*b–b* Ice conditions Nov. 26 to Dec. 31.

MONTHLY DISCHARGE of Kananaskis River near Seebe, for 1915.

(Drainage area 390 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage area. | Acre-feet. |
| January | 123 | 75 | 97 | 0.249 | 0.29 | 5,964 |
| February | 163 | 97 | 145 | 0.372 | 0.39 | 8,053 |
| March | 163 | 107 | 133 | 0.341 | 0.39 | 8,178 |
| April | 383 | 128 | 200 | 0.513 | 0.57 | 11,901 |
| May | 1,296 | 461 | 921 | 2.360 | 2.72 | 56,630 |
| June | 5,380 | 1,109 | 1,893 | 4.850 | 5.41 | 112,640 |
| July | 3,217 | 1,589 | 2,010 | 5.150 | 5.94 | 123,590 |
| August | 1,645 | 1,119 | 1,363 | 3.490 | 4.02 | 83,810 |
| September | 1,119 | 646 | 811 | 2.080 | 2.32 | 48,258 |
| October | 630 | 383 | 480 | 1.230 | 1.42 | 29,514 |
| November | 400 | 296 | 328 | 0.841 | 0.94 | 19,517 |
| December | 298 | 204 | 266 | 0.682 | 0.79 | 16,356 |
| The year | ..... | ..... | ..... | ..... | 25.20 | 524,411 |

GHOST RIVER AT GILLIES' RANCH.

*Location.*—One mile above the junction with the Bow River, on the NE. ¼ Sec. 23, Tp. 26, Rge. 6, W. 5th Mer.

*Records available.*—August 17, 1911; November 11, 1911; January 1, 1912; December 31, 1915.

*Gauge.*—Chain, on left bank. 1911–13, elevation of zero, 91.15 feet. 1914 to June 26, 1915, elevation of zero. 89.22 feet.

*Bench-mark.*—Assumed elevation, 100.00 feet.

*Channel.*—Shifting gravel, changed after June 26.

*Discharge measurements.*—Made by wading; at very high stages measurements made at highway bridge one mile downstream.

*Flood.*—June 26, gauge height, 10.17. Stream overflowed banks and cut out much larger channel, large amount of debris taken away downstream owing to dam up above gauging section breaking out and causing large rush of water.

*Observer.*—Miss E. Gillies.

DISCHARGE MEASUREMENTS of Ghost River at Gillies' Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 7 | H. C. Ritchie | 31.0 | 59.0 | 1.93 | 4.50 | 114.1 |
| Jan. 21 | do | 26.0 | 64.8 | 1.68 | 4.64 | 109.0 |
| Feb. 4 | do | 25.0 | 68.5 | 1.42 | 5.18 | 97.3 |
| Feb. 18 | do | 25.0 | 53.8 | 1.72 | 4.24 | 92.6 |
| Mar. 3 | do | 25.0 | 53.0 | 1.71 | 3.51 | 91.0 |
| Mar. 16 | do | 31.0 | 43.0 | 2.24 | 3.72 | 96.0 |
| Mar. 30 | do | 52.5 | 41.0 | 2.34 | 2.92 | 96.0 |
| April 15 | do | 55.5 | 42.4 | 2.53 | 3.00 | 108.0 |
| April 29 | G. H. Whyte, H. C. Ritchie | 54.0 | 44.5 | 2.60 | 3.07 | 116.0 |
| June 18 | H. C. Ritchie | 92.0 | 239.6 | 5.49 | 5.56 | 1,317.0 |
| Aug. 6 | do | 86.0 | 231.0 | 4.75 | 4.20 | 1,096.0 |
| Aug. 27 | do | 175.5 | 168.0 | 3.80 | 3.76 | 638.0 |
| Sept. 22 | do | 92.0 | 136.7 | 4.08 | 3.59 | 558.0 |
| Oct. 12 | do | 112.5 | 149.5 | 3.04 | 3.49 | 455.0 |
| Oct. 28 | do | 101.0 | 156.2 | 2.33 | 3.37 | 364.0 |
| Nov. 11 | do | 99.0 | 137.2 | 2.13 | 3.36 | 292.0 |
| Nov. 25 | J. E. Caughey | 96.0 | 123.7 | 2.13 | 3.21 | 264.0 |
| Dec. 9 | do | 76.0 | 93.6 | 2.62 | 3.14 | 247.0 |

DAILY GAUGE HEIGHT AND DISCHARGE of Ghost River at Gillies' Ranch, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 4.75*a* | 112 | 4.74 | 94 | 3.60 | 91 | 2.95 | 95 | 3.18 | 145 | 3.93 | 362 |
| 2 | 4.50 | 111 | 5.15 | 95 | 3.65 | 91 | 3.20 | 150 | 3.48 | 220 | 4.35 | 530 |
| 3 | 4.49 | 111 | 5.52 | 96 | 3.51 | 91 | 3.22 | 155 | 3.50 | 225 | 4.12 | 438 |
| 4 | 4.40 | 112 | 4.40 | 97 | 4.05 | 92 | 3.32 | 180 | 3.68 | 279 | 4.14 | 446 |
| 5 | 4.45 | 112 | 4.60 | 97 | 4.15 | 96 | 3.30 | 175 | 3.59 | 252 | 3.90 | 350 |
| 6 | 4.56 | 113 | 4.40 | 98 | 4.10 | 96 | 3.32 | 180 | 3.35 | 187 | 3.98 | 382 |
| 7 | 4.50 | 114 | 4.40 | 97 | 4.15 | 97 | 3.26 | 165 | 3.75 | 303 | 4.45 | 575 |
| 8 | 4.60 | 116 | 4.50 | 97 | 3.64 | 96 | 3.30 | 175 | 3.32 | 180 | 4.09 | 426 |
| 9 | 4.86 | 117 | 4.45 | 97 | 3.30 | 95 | 3.32 | 180 | 3.56 | 243 | 4.02 | 398 |
| 10 | 4.36 | 118 | 4.80 | 96 | 3.32 | 92 | 3.38 | 195 | 3.54 | 237 | 4.00 | 390 |
| 11 | 4.36 | 117 | 5.40 | 95 | 3.36 | 93 | 3.30 | 175 | 3.50 | 225 | 4.05 | 410 |
| 12 | 4.38 | 116 | 5.41 | 94 | 3.98 | 95 | 3.31 | 177 | 3.39 | 198 | 4.35 | 530 |
| 13 | 4.90 | 115 | 4.95 | 93 | 3.98 | 98 | 3.15 | 137 | 3.79 | 311 | 4.20 | 470 |
| 14 | 5.35 | 113 | 4.45 | 92 | 3.40 | 98 | 3.16 | 140 | 3.94 | 356 | 4.38 | 542 |
| 15 | 5.41 | 110 | 4.45 | 92 | 3.43 | 96 | 3.00 | 105 | 3.97 | 378 | 4.29 | 506 |
| 16 | 5.54 | 108 | 4.40 | 92 | 3.47 | 96 | 3.02 | 109 | 3.75 | 303 | 4.74 | 724 |
| 17 | 4.94 | 106 | 4.30 | 93 | 3.70 | 96 | 3.05 | 115 | 3.80 | 315 | 4.76 | 736 |
| 18 | 4.68 | 105 | 4.24 | 93 | 4.30 | 96 | 3.10 | 125 | 3.96 | 374 | 5.56 | 1,319 |
| 19 | 4.55 | 107 | 4.00 | 94 | 4.95 | 96 | 3.08 | 121 | 3.80 | 315 | 5.88 | 1,652 |
| 20 | 4.36 | 110 | 3.85 | 95 | 3.85 | 96 | 3.05 | 115 | 3.90 | 350 | 5.75 | 1,510 |
| 21 | 4.64 | 109 | 3.85 | 96 | 4.02 | 97 | 3.00 | 105 | 4.10 | 450 | 5.39 | 1,172 |
| 22 | 4.40 | 108 | 4.00 | 97 | 4.02 | 97 | 2.94 | 93 | 4.06 | 414 | 5.46 | 1,319 |
| 23 | 4.40 | 105 | 4.22 | 97 | 3.45 | 97 | 2.99 | 103 | 4.15 | 450 | 5.61 | 1,383 |
| 24 | 4.40 | 102 | 4.00 | 94 | 3.06 | 97 | 3.08 | 121 | 4.11 | 446 | 5.80 | 1,560 |
| 25 | 4.46 | 99 | 3.94 | 92 | 3.30 | 96 | 3.09 | 123 | 4.15 | 450 | 5.80 | 1,560 |
| 26 | 4.44 | 95 | 3.65 | 91 | 2.90 | 96 | 3.00 | 105 | 4.40 | 550 | 6.12 | 8,440 |
| 27 | 5.29 | 93 | 3.54 | 90 | 2.90 | 96 | 2.99 | 103 | 4.27 | 498 | 8.50 | 4,7[illegible] |
| 28 | 5.29 | 92 | 3.56 | 91 | 2.95 | 96 | 2.99 | 103 | 4.20 | 470 | 7.12 | 2,[illegible] |
| 29 | 5.05 | 92 | | | 2.90 | 96 | 3.02 | 109 | 4.29 | 506 | 7.12 | 2,[illegible] |
| 30 | 5.20 | 93 | | | 2.92*a* | 96 | 3.11 | 127 | 4.04 | 406 | 7.08 | 1,7[illegible] |
| 31 | 5.10 | 94 | ... | ... | 2.96 | 97 | ... | ... | 3.88 | 343 | | |

*a*–*a* Winter conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Ghost River at Gillies' Ranch, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 4.55 | 1,505 | 4.55 | 1,505 | 3.65 | 560 | 3.56 | 490 | 3.35 | 342 | 3.54 | 475 |
| 2 | 4.59 | 1,557 | 4.48 | 1,416 | 3.65 | 560 | 3.56 | 490 | 3.34 | 336 | 3.39 | 368 |
| 3 | 4.65 | 1,635 | 4.40 | 1,320 | 3.65 | 560 | 3.56 | 490 | 3.34 | 336 | 3.29 | 305 |
| 4 | 4.80 | 1,830 | 4.30 | 1,210 | 3.65 | 560 | 3.56 | 490 | 3.32 | 323 | 3.29 | 305 |
| 5 | 4.20 | 1,100 | 4.21 | 1,111 | 3.64 | 552 | 3.55 | 483 | 3.30 | 310 | 3.25 | 285 |
| 6 | 3.90 | 785 | 4.20 | 1,100 | 3.62 | 536 | 3.52 | 460 | 3.30 | 310 | 3.21 | 265 |
| 7 | 4.15 | 1,045 | 4.28 | 1,188 | 3.88 | 766 | 3.52 | 460 | 3.29 | 305 | 3.25 | 285 |
| 8 | 3.86 | 747 | 4.15 | 1,045 | 3.89 | 775 | 3.50 | 445 | 3.24 | 280 | 3.18 | 250 |
| 9 | 3.86 | 747 | 4.10 | 990 | 3.88 | 766 | 3.46 | 417 | 3.26 | 290 | 3.17 | 245 |
| 10 | 3.96 | 845 | 4.08 | 969 | 3.76 | 654 | 3.50 | 445 | 3.34 | 336 | 3.14 | 244*a* |
| 11 | 3.75 | 645 | 4.05 | 937 | 3.74 | 636 | 3.50 | 445 | 3.36 | 349 | 3.27 | 242 |
| 12 | 3.67 | 576 | 4.05 | 937 | 3.68 | 584 | 3.49 | 438 | 3.34 | 336 | 3.37 | 240 |
| 13 | 4.29 | 1,199 | 4.04 | 927 | 3.65 | 560 | 3.47 | 424 | 3.39 | 369 | 3.54 | 238 |
| 14 | 5.50 | 2,825 | 4.00 | 885 | 3.65 | 560 | 3.46 | 417 | 3.35 | 342 | 3.62 | 236 |
| 15 | 5.00 | 2,100 | 4.00 | 885 | 3.64 | 552 | 3.46 | 417 | 3.29 | 305 | 3.79 | 234 |
| 16 | 4.62 | 1,596 | 3.95 | 835 | 3.63 | 544 | 3.45 | 410 | 3.26 | 290 | 3.88 | 232 |
| 17 | 5.15 | 2,317 | 3.94 | 825 | 3.62 | 536 | 3.45 | 410 | 3.24 | 280 | 3.88 | 231 |
| 18 | 5.00 | 2,100 | 4.04 | 927 | 3.62 | 536 | 3.44 | 403 | 3.24 | 280 | 4.02 | 230 |
| 19 | 4.45 | 1,380 | 4.15 | 1,045 | 3.70 | 600 | 3.44 | 403 | 3.24 | 280 | 4.08 | 228 |
| 20 | 4.60 | 1,570 | 5.10 | 2,245 | 3.65 | 560 | 3.44 | 403 | 3.25 | 285 | 4.46 | 226 |
| 21 | 4.65 | 1,635 | 4.40 | 1,320 | 3.62 | 536 | 3.43 | 396 | 3.26 | 290 | 4.54 | 224 |
| 22 | 4.69 | 1,687 | 4.03 | 917 | 3.59 | 512 | 3.43 | 396 | 3.21 | 265 | 4.63 | 220 |
| 23 | 4.60 | 1,570 | 3.96 | 845 | 3.65 | 560 | 3.43 | 396 | 3.21 | 265 | 4.83 | 216 |
| 24 | 4.54 | 1,492 | 3.89 | 775 | 3.72 | 618 | 3.42 | 389 | 3.21 | 265 | 4.69 | 213 |
| 25 | 4.30 | 1,210 | 3.81 | 700 | 3.62 | 536 | 3.40 | 375 | 3.29 | 305 | 4.66 | 207 |
| 26 | 4.29 | 1,199 | 3.80 | 690 | 3.61 | 528 | 3.39 | 369 | 3.24 | 280 | 4.60 | 202 |
| 27 | 4.28 | 1,188 | 3.76 | 654 | 3.59 | 512 | 3.38 | 362 | 3.23 | 275 | 3.76 | 196 |
| 28 | 4.95 | 2,030 | 3.74 | 636 | 3.57 | 497 | 3.37 | 356 | 3.36 | 349 | 3.77 | 190 |
| 29 | 4.82 | 1,856 | 3.68 | 584 | 3.56 | 490 | 3.36 | 349 | 3.44 | 403 | 3.79 | 182 |
| 30 | 4.60 | 1,570 | 3.67 | 576 | 3.56 | 490 | 3.35 | 342 | 3.50 | 445 | 3.85 | 175 |
| 31 | 4.55 | 1,505 | 3.65 | 560 | ..... | ..... | 3.35 | 342 | ..... | ..... | 3.86 | 167*b* |

*a–b* Winter conditions.

MONTHLY DISCHARGE of Ghost River at Gillies' Ranch, for 1915.

(Drainage area 375 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 118 | 92 | 107 | 0.285 | 0.33 | 6,579 |
| February | 98 | 90 | 94 | 0.251 | 0.26 | 5,220 |
| March | 98 | 91 | 95 | 0.253 | 0.29 | 5,841 |
| April | 195 | 93 | 135 | 0.360 | 0.40 | 8,033 |
| May | 550 | 145 | 334 | 0.890 | 1.03 | 20,537 |
| June | 8,440 | 350 | 1,301 | 3.470 | 3.87 | 77,420 |
| July | 2,825 | 576 | 1,453 | 3.870 | 4.46 | 89,340 |
| August | 2,245 | 560 | 986 | 2.630 | 3.03 | 60,627 |
| September | 775 | 490 | 574 | 1.530 | 1.71 | 34,155 |
| October | 490 | 342 | 417 | 1.110 | 1.28 | 25,640 |
| November | 445 | 265 | 314 | 0.837 | 0.93 | 18,684 |
| December | 475 | 167 | 244 | 0.651 | 0.75 | 15,003 |
| The year | ..... | ..... | ..... | ..... | 18.34 | 367,079 |

JUMPINGPOUND CREEK NEAR JUMPINGPOUND.

*Location.*—On the SE. ¼ Sec. 30, Tp. 24, Rge. 4, W. 5th Mer., at Jumpingpound post office.

*Records available.*—April 19, 1908, to October 31, 1915. Discharge measurements only, June 1906.

*Gauge.*—Vertical staff attached to bridge pile. Elevation of zero has been maintained at 89.82 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark on right bank. Assumed elevation, 100.00 feet.

*Channel.*—Permanent.

*Discharge measurements.*—At high water, made from highway bridge; at ordinary stages by wading downstream.

*Winter flow.*—No winter records have been obtained.

*Flood.*—The stream was in flood June 26. Maximum gauge height, 6.59. The stream did not overflow its banks.

*Observer.*—John Bateman.

DISCHARGE MEASUREMENTS of Jumpingpound Creek near Jumpingpound, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 15 | H. C. Ritchie | 15.5 | 12.1 | 0.54 | 2.00 | 6.7 |
| Mar. 29 | do | 34.0 | 14.8 | 0.80 | 1.87 | 11.8 |
| April 14 | do | 30.0 | 32.6 | 0.54 | 1.90 | 17.7 |
| May 6 | do | 59.5 | 87.4 | 1.80 | 2.61 | 157.0 |
| June 5 | do | 106.0 | 266.0 | 2.02 | 3.18 | 538.0 |
| June 19 | do | 119.0 | 302.0 | 3.04 | 3.50 | 907.0 |
| Aug. 7 | do | 69.5 | 100.8 | 2.05 | 2.64 | 206.0 |
| Aug. 26 | do | 69.3 | 99.9 | 2.08 | 2.54 | 207.0 |
| Sept. 21 | do | 66.6 | 92.3 | 1.56 | 2.48 | 144.0 |
| Oct. 13 | do | 65.5 | 88.0 | 1.22 | 2.38 | 108.0 |
| Oct. 29 | do | 64.0 | 84.4 | 1.19 | 2.29 | 100.0 |

March 15 ice on sides, stream just breaking up.

DAILY GAUGE HEIGHT AND DISCHARGE of Jumpingpound Creek near Jumpingpound, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.00 | 32 | 2.78 | 277 | 2.79 | 282 |
| 2 | ..... | ..... | 1.98 | 29 | 2.48 | 152 | 3.54 | 960 |
| 3 | ..... | ..... | 1.98 | 29 | 2.57 | 185 | 3.54 | 960 |
| 4 | ..... | ..... | 1.96 | 26 | 2.55 | 177 | 3.31 | 672 |
| 5 | ..... | ..... | 1.95 | 24 | 2.56 | 181 | 3.29 | 650 |
| 6 | ..... | ..... | 1.95 | 24 | 2.60 | 196 | 3.33 | 695 |
| 7 | ..... | ..... | 1.95 | 24 | 2.70 | 237 | 3.38 | 753 |
| 8 | ..... | ..... | 1.94 | 22 | 2.75 | 262 | 3.34 | 706 |
| 9 | ..... | ..... | 1.94 | 22 | 2.70 | 237 | 3.09 | 469 |
| 10 | ..... | ..... | 1.93 | 21 | 2.60 | 196 | 3.01 | 411 |
| 11 | ..... | ..... | 1.92 | 19 | 2.55 | 177 | 2.96 | 389 |
| 12 | ..... | ..... | 1.92 | 19 | 2.50 | 158 | 3.04 | 433 |
| 13 | ..... | ..... | 1.91 | 18 | 2.53 | 169 | 3.05 | 440 |
| 14 | ..... | ..... | 1.92 | 19 | 3.30 | 660 | 3.29 | 564 |
| 15 | 2.00 | 32 | 1.92 | 19 | 3.10 | 476 | 3.34 | 706 |
| 16 | 2.35 | 111 | 1.93 | 21 | 2.95 | 373 | 3.34 | 706 |
| 17 | 2.65 | 216 | 1.94 | 22 | 2.75 | 262 | 3.65 | 1,112 |
| 18 | 2.55 | 177 | 1.96 | 26 | 2.54 | 173 | 3.85 | 1,409 |
| 19 | 2.44 | 139 | 1.99 | 30 | 2.40 | 126 | 3.54 | [illegible] |
| 20 | 2.34 | 109 | 2.00 | 32 | 2.32 | 103 | 3.44 | 828 |
| 21 | 2.14 | 60 | 2.01 | 34 | 2.35 | 111 | 3.29 | 650 |
| 22 | 2.03 | 38 | 2.02 | 36 | 2.50 | 158 | 4.19 | 542 |
| 23 | 2.02 | 36 | 2.01 | 34 | 3.20 | 500 | 4.19 | 542 |
| 24 | 2.02 | 36 | 2.01 | 34 | 3.40 | 776 | 4.29 | 640 |
| 25 | 2.00 | 32 | 2.01 | 34 | 3.55 | 973 | 3.64 | 1,097 |
| 26 | 1.97 | 27 | 2.01 | 34 | 3.45 | 842 | 6.59 | 3,784 |
| 27 | 1.95 | 24 | 2.01 | 34 | 3.[illegible] | 680 | 5.[illegible] | [illegible] |
| 28 | 1.94 | 22 | 2.01 | 34 | 3.17 | 535 | 4.24 | [illegible] |
| 29 | 1.93 | 21 | 2.01 | 34 | 3.10 | 476 | 4.84 | 1,[illegible] |
| 30 | 1.92 | 19 | 2.08 | 48 | 3.05 | 440 | 3.69 | 1,149 |
| 31 | 1.92 | 19 | ..... | ..... | 2.80 | 287 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Jumpingpound Creek near Jumpingpound, for 1915. —*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.55 | 973 | 3.13 | 501 | 2.34 | 109 | 2.49 | 155 |
| 2 | 3.35 | 718 | 2.98 | 393 | 2.29 | 95 | 2.49 | 155 |
| 3 | 3.25 | 610 | 2.88 | 329 | 2.24 | 82 | 2.46 | 146 |
| 4 | 3.40 | 776 | 2.83 | 303 | 2.53 | 169 | 2.46 | 146 |
| 5 | 3.20 | 560 | 2.78 | 277 | 2.44 | 139 | 2.44 | 139 |
| 6 | 3.36 | 730 | 2.58 | 188 | 2.39 | 123 | 2.42 | 133 |
| 7 | 3.45 | 842 | 2.57 | 185 | 2.44 | 139 | 2.46 | 146 |
| 8 | 3.45 | 842 | 2.54 | 173 | 2.43 | 136 | 2.44 | 139 |
| 9 | 3.25 | 610 | 2.54 | 173 | 2.44 | 139 | 2.43 | 136 |
| 10 | 3.05 | 440 | 2.52 | 166 | 2.45 | 142 | 2.46 | 146 |
| 11 | 3.06 | 447 | 2.51 | 162 | 2.43 | 136 | 2.45 | 142 |
| 12 | 3.01 | 411 | 2.49 | 155 | 2.43 | 136 | 2.43 | 136 |
| 13 | 3.56 | 987 | 2.48 | 152 | 2.40 | 126 | 2.42 | 133 |
| 14 | 5.06 | 3,336 | 2.45 | 142 | 2.42 | 133 | 2.40 | 126 |
| 15 | 3.86 | 1,424 | 2.43 | 136 | 2.40 | 126 | 2.39 | 123 |
| 16 | 3.66 | 1,126 | 2.42 | 133 | 2.40 | 126 | 2.39 | 123 |
| 17 | 4.56 | 2,536 | 2.41 | 129 | 2.41 | 129 | 2.38 | 120 |
| 18 | 4.56 | 2,536 | 2.39 | 123 | 2.52 | 166 | 2.43 | 136 |
| 19 | 3.96 | 1,578 | 2.38 | 120 | 2.50 | 158 | 2.42 | 133 |
| 20 | 3.66 | 1,126 | 3.61 | 1,054 | 2.50 | 158 | 2.42 | 133 |
| 21 | 3.37 | 741 | 3.33 | 695 | 2.48 | 152 | 2.40 | 126 |
| 22 | 3.27 | 630 | 2.90 | 340 | 2.46 | 146 | 2.38 | 120 |
| 23 | 3.27 | 630 | 2.65 | 216 | 2.44 | 139 | 2.38 | 120 |
| 24 | 3.22 | 580 | 2.57 | 185 | 2.49 | 155 | 2.37 | 117 |
| 25 | 3.22 | 580 | 2.57 | 185 | 2.48 | 152 | 2.36 | 114 |
| 26 | 3.77 | 1,287 | 2.54 | 173 | 2.47 | 149 | 2.35 | 111 |
| 27 | 3.02 | 418 | 2.49 | 155 | 2.46 | 146 | 2.34 | 109 |
| 28 | 3.07 | 454 | 2.46 | 146 | 2.48 | 152 | 2.36 | 114 |
| 29 | 3.42 | 802 | 2.43 | 136 | 2.44 | 139 | 2.34 | 109 |
| 30 | 3.08 | 862 | 2.39 | 123 | 2.44 | 139 | 2.34 | 109 |
| 31 | 3.03 | 426 | 2.36 | 114 | ..... | ..... | 2.35 | 111 |

MONTHLY DISCHARGE of Jumpingpound Creek near Jumpingpound, for 1915.

(Drainage area 185 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (15 to 31) | 216 | 19 | 66 | 0.357 | 0.23 | 2,217 |
| April | 48 | 18 | 28 | 0.151 | 0.17 | 1,666 |
| May | 973 | 103 | 342 | 1.850 | 2.13 | 21,029 |
| June | 5,784 | 282 | 1,042 | 5.630 | 6.28 | 62,000 |
| July | 3,336 | 411 | 968 | 5.230 | 6.03 | 59,520 |
| August | 1,054 | 114 | 241 | 1.300 | 1.50 | 14,819 |
| September | 169 | 82 | 138 | 0.746 | 0.83 | 8,212 |
| October | 155 | 109 | 129 | 0.697 | 0.80 | 7,932 |
| The period | ..... | ..... | ..... | ..... | 18.07 | 177,395 |

BOW RIVER AT CALGARY.

*Location.*—On the NE. ¼ Sec. 15, Tp. 24, Rge. 1, W. 5th Mer., at Langevin traffic bridge on 4th street E. in the city of Calgary.

*Records available.*—May 5, 1908, to Dec. 31, 1915.

*Gauges.*—Standard chain type on Langevin bridge; elevation of zero maintained at 82.59 feet during 1915. Gurley automatic gauge on central pier. Elevation of zero maintained at 82.59 feet during 1915. Vertical staff gauge set in cement on central pier. Elevation of zero maintained at 87.20 feet during 1915.

*Bench-mark.*—Permanent iron bench-mark near the intersection of Second and Third avenues, East. Assumed elevation, 100.00 feet.

*Channel.*—Coarse gravel, shifting in floods.

*Discharge measurements.*—Made from bridge.

*Floods.*—June 26, 1915, maximum chain gauge height was 12.50 feet with corresponding discharge of 41,650 sec.-feet.

*Observer.*—C. A. Lang.

DISCHARGE MEASUREMENTS of Bow River at Calgary, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 8, 9 | R. J. McGuinness | 278.0 | 700 | 1.74 | 4.67*c* | 1,220 |
| Jan. 26 | H. S. Kerby | 270.0 | 707 | 1.49 | 5.64*c* | 1,256 |
| Feb. 11 | H. W. Rowley | 175.0 | 655 | 1.76 | 5.40*c* | 1,155 |
| Mar. 2 | do | 274.0 | 679 | 1.90 | 5.52*c* | 1,287 |
| Mar. 24 | R. J. McGuinness | 175.0 | 481 | 3.85 | 4.60*c* | 1,452 |
| April 6 | do | 284.0 | 1,000 | 1.71 | 4.50*c* | 1,715 |
| April 28 | do | 283.0 | 927 | 2.07 | 4.18*c* | 1,922 |
| May 20 | H. M. Nelson | 295.0 | 1,264 | 3.14 | 5.10*c* | 3,963 |
| June 9 | do | 307.0 | 1,615 | 4.44 | 6.22*c* | 7,172 |
| June 26 | G. H. Whyte | 356.5 | 3,833 | 9.64 | 10.89*a* | 36,942 |
| June 27 | do | 356.5 | 3,472 | 8.22 | 10.13*a* | 28,555 |
| June 27 | do | 358.0 | 3,250 | 6.95 | 9.84*a* | 22,601 |
| June 28 | do | 358.0 | 3,149 | 7.46 | 9.39*a* | 23,497 |
| June 29 | G. R. Elliott | 356.0 | 2,906 | 7.00 | 9.10*a* | 20,343 |
| July 8 | do | 332.3 | 2,597 | 5.90 | 8.32*a* | 15,319 |
| Aug. 10 | H. M. Nelson | 318.3 | 1,687 | 4.85 | 6.68*a* | 8,286 |
| Sept. 13 | do | 312.3 | 1,299 | 3.24 | 5.30*a* | 4,213 |
| Nov. 5 | do | 295.3 | 984 | 2.30 | 4.30*a* | 2,261 |
| Dec. 13 | F. K. Beach | 265.3 | 635 | 2.25 | 3.98*c* | 1,431 |

*a* Automatic gauge.
*c* Chain gauge.

DAILY GAUGE HEIGHT AND DISCHARGE of Bow River at Calgary, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 5.04*a* | 1,050 | 5.64 | 1,260 | 5.47 | 1,280 | 4.33 | 1,510 | 4.52 | 2,480 | 5.72 | 5,460 |
| 2 | 5.01 | 1,060 | 5.69 | 1,240 | 5.48 | 1,287 | 4.32 | 1,520 | 4.80 | 3,060 | 5.86 | 5,880 |
| 3 | 4.94 | 1,070 | 5.69 | 1,220 | 5.45 | 1,296 | 4.29 | 1,580 | 4.80 | 3,060 | 6.08 | 6,540 |
| 4 | 5.01 | 1,085 | 5.67 | 1,200 | 5.36 | 1,307 | 4.34 | 1,700 | 4.76 | 2,972 | 5.98 | 6,240 |
| 5 | 4.94 | 1,100 | 5.64 | 1,187 | 5.28 | 1,315 | 4.49 | 1,820 | 4.72 | 2,884 | 5.94 | 6,120 |
| 6 | 4.84 | 1,120 | 5.61 | 1,175 | 5.19 | 1,321 | 4.30 | 1,715 | 4.66 | 2,760 | 5.92 | 6,060 |
| 7 | 4.33 | 1,145 | 5.51 | 1,165 | 5.26 | 1,328 | 4.12 | 1,590 | 4.90 | 3,300 | 5.97 | 6,210 |
| 8 | 4.44 | 1,180 | 5.36 | 1,155 | 5.17 | 1,335 | 3.94 | 1,360 | 5.15 | 3,925 | 6.30 | 7,250 |
| 9 | 4.69 | 1,220 | 5.31 | 1,150 | 5.10 | 1,342 | 3.88*b* | 1,250 | 5.35 | 4,438 | 6.18 | 6,840 |
| 10 | 4.79 | 1,240 | 5.33 | 1,150 | 5.16 | 1,352 | 3.82 | 1,194 | 5.65 | 5,262 | 5.96 | 6,180 |
| 11 | 4.81 | 1,275 | 5.27 | 1,155 | 5.09 | 1,361 | 3.88 | 1,296 | 5.65 | 5,262 | 5.91*d* | 6,030 |
| 12 | 4.92 | 1,305 | 5.27 | 1,155 | 4.97 | 1,372 | 3.95 | 1,415 | 5.66 | 5,290 | 6.14*c* | 6,520 |
| 13 | 5.04 | 1,320 | 5.02 | 1,160 | 5.02 | 1,383 | 3.85 | 1,245 | 5.50 | 4,850 | 6.10 | 6,400 |
| 14 | 4.86 | 1,300 | 5.30 | 1,170 | 4.97 | 1,397 | 3.88 | 1,296 | 5.72 | 5,460 | 6.11 | 6,430 |
| 15 | 4.78 | 1,265 | 5.05 | 1,185 | 4.92 | 1,407 | 3.83 | 1,211 | 5.81 | 5,730 | 6.21 | 6,735 |
| 16 | 4.69 | 1,235 | 5.50 | 1,197 | 4.91 | 1,420 | 3.84 | 1,228 | 5.45 | 4,712 | 6.33 | 7,155 |
| 17 | 4.62 | 1,205 | 5.47 | 1,204 | 4.92*c* | 1,428 | 3.86 | 1,262 | 5.32 | 4,355 | 6.75 | 8,625 |
| 18 | 4.58 | 1,235 | 5.50 | 1,206 | 4.93 | 1,438 | 3.95 | 1,415 | 5.30 | 4,300 | 7.44 | 11,360 |
| 19 | 5.05 | 1,320 | 5.47 | 1,209 | 4.91 | 1,445 | 4.10 | 1,680 | 5.25 | 4,175 | 7.42 | 11,280 |
| 20 | 4.94 | 1,300 | 5.50 | 1,206 | 4.86 | 1,455 | 4.12 | 1,716 | 5.10 | 3,800 | 7.37 | 11,080 |
| 21 | 4.75 | 1,270 | 5.40 | 1,196 | 4.80 | 1,460 | 4.22 | 1,898 | 5.08 | 3,750 | 7.25 | 10,600 |
| 22 | 4.75 | 1,245 | 5.30 | 1,192 | 4.76 | 1,462 | 4.27 | 1,993 | 5.19 | 3,800 | 7.19 | 10,400 |
| 23 | 4.40 | 1,215 | 5.37 | 1,196 | 4.73 | 1,460 | 4.27 | 1,993 | 5.15 | 4,438 | 7.10 | 10,000 |
| 24 | 4.54*c* | 1,270 | 5.41 | 1,206 | 4.54 | 1,452 | 4.24 | 1,946 | 5.51 | 4,878 | 7.23 | 10,720 |
| 25 | 4.69*c* | 1,260 | 5.47 | 1,221 | 4.39 | 1,440 | 4.25 | 1,955 | 5.79 | 5,670 | 7.40 | 11,600 |
| 26 | 4.83*c* | 1,256 | 5.50 | 1,240 | 4.29 | 1,442 | 4.23 | 1,917 | 5.81 | 5,730 | 10.87 | 28,100 |
| 27 | 4.97*c* | 1,270 | 5.57 | 1,260 | 4.26 | 1,454 | 4.19 | 1,842 | 5.71 | 5,400 | 9.[illegible] | 24,870 |
| 28 | 5.11*c* | 1,278 | 5.50 | 1,267 | 4.31 | 1,466 | 4.18 | 1,824 | 5.68 | 5,345 | 9.16 | 22,425 |
| 29 | 5.25*c* | 1,283 | | | 4.30 | 1,482 | 4.20 | 1,860 | 5.78 | 5,640 | 9.[illegible] | 18,640 |
| 30 | 5.39 | 1,280 | | | 4.31 | 1,497 | 4.24 | 1,946 | 5.83 | 5,790 | 8.88 | 15,790 |
| 31 | 5.44 | 1,275 | | | 4.31 | 1,504 | | | 5.79 | 5,670 | | |

*a–b* Ice conditions.
*a–d* Chain gauge.
*c* Gauge heights interpolated.
*c–c* Auto gauge.

DAILY GAUGE HEIGHT AND DISCHARGE of Bow River at Calgary, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 8.86*b* | 18,590 | 7.49 | 11,560 | 6.06 | 6,280 | 4.86 | 3,016 | 4.49 | 2,276 | 4.22 | 1,390 |
| 2 | 8.76 | 17,940 | 7.34 | 10,960 | 6.06 | 6,280 | 4.86 | 3,016 | 4.46 | 2,217 | 3.98 | 1,390 |
| 3 | 8.62 | 17,030 | 7.28 | 10,720 | 6.00 | 6,100 | 4.88 | 3,058 | 4.43 | 2,158 | 3.97 | 1,406 |
| 4 | 8.38 | 15,700 | 7.23 | 10,520 | 5.84 | 5,620 | 4.86 | 3,016 | 4.51 | 2,314 | 4.38 | 1,425 |
| 5 | 8.34 | 15,500 | 7.09 | 9,960 | 5.76 | 5,380 | 4.83 | 2,953 | 4.54 | 2,373 | 4.39 | 1,450 |
| 6 | 8.35 | 15,550 | 6.95 | 9,400 | 5.77 | 5,410 | 4.82 | 2,932 | 4.36 | 2,026 | 4.44 | 1,465 |
| 7 | 8.32 | 15,400 | 6.84 | 8,960 | 5.80 | 5,500 | 4.82 | 2,932 | 4.27 | 1,860 | 4.37 | 1,475 |
| 8 | 8.32 | 15,400 | 6.75 | 8,625 | 5.70 | 5,200 | 4.81 | 2,911 | 4.26 | 1,841 | 4.39 | 1,485 |
| 9 | 8.34 | 15,500 | 6.70 | 8,450 | 5.65 | 5,050 | 4.80 | 2,890 | 4.19 | 1,714 | 4.43 | 1,470 |
| 10 | 8.36 | 15,600 | 6.61 | 8,135 | 5.01 | 3,333 | 4.78 | 2,850 | 4.16 | 1,664 | 4.33 | 1,440 |
| 11 | 8.39 | 15,750 | 6.56 | 7,960 | 5.10 | 3,540 | 4.76 | 2,810 | 4.15 | 1,648 | 4.10 | 1,415 |
| 12 | 8.42 | 15,910 | 6.51 | 7,785 | 5.19 | 3,747 | 4.74 | 2,770 | 4.21*b* | 1,748 | 4.21 | 1,410 |
| 13 | 8.45 | 16,075 | 6.51 | 7,785 | 5.28 | 3,970 | 4.72 | 2,730 | 4.16*a* | 1,760 | 4.26 | 1,431 |
| 14 | 8.48 | 16,240 | 6.42 | 7,470 | 5.17 | 3,701 | 4.70 | 2,690 | 4.17 | 1,760 | 4.13 | 1,330 |
| 15 | 7.99 | 13,755 | 6.40 | 7,400 | 5.08 | 3,494 | 4.69 | 2,670 | 4.57 | 1,748 | 4.06 | 1,275 |
| 16 | 8.08 | 14,200 | 6.37 | 7,295 | 5.02 | 3,356 | 4.68 | 2,650 | 4.55 | 1,715 | 3.99 | 1,260 |
| 17 | 8.57 | 16,735 | 6.37 | 7,295 | 5.00 | 3,310 | 4.67 | 2,630 | 4.64 | 1,680 | 3.78 | 1,260 |
| 18 | 8.39 | 15,750 | 6.49 | 7,715 | 4.98 | 3,268 | 4.66 | 2,610 | 4.60 | 1,620 | 3.95 | 1,260 |
| 19 | 8.16 | 14,600 | 6.75 | 8,625 | 5.06 | 3,448 | 4.65 | 2,590 | 4.50 | 1,580 | 4.12 | 1,260 |
| 20 | 8.02 | 13,900 | 7.49 | 11,560 | 5.11 | 3,563 | 4.64 | 2,570 | 4.50 | 1,560 | 4.44 | 1,255 |
| 21 | 7.91 | 13,395 | 7.14 | 10,160 | 5.06 | 3,448 | 4.63 | 2,550 | 4.40 | 1,560 | 4.49 | 1,245 |
| 22 | 7.83 | 13,035 | 6.73 | 8,555 | 5.02 | 3,356 | 4.62 | 2,530 | 4.35 | 1,560 | 4.81 | 1,225 |
| 23 | 7.80 | 12,900 | 6.47 | 7,645 | 5.15 | 3,655 | 4.61 | 2,510 | 4.44 | 1,565 | 4.88 | 1,195 |
| 24 | 7.66 | 12,270 | 6.30 | 7,050 | 5.18 | 3,724 | 4.60 | 2,490 | 4.60 | 1,565 | 4.71 | 1,150 |
| 25 | 7.66 | 12,270 | 6.34 | 7,190 | 5.09 | 3,517 | 4.59 | 2,470 | 4.58 | 1,550 | 4.69 | 1,075 |
| 26 | 7.59 | 11,960 | 6.26 | 6,910 | 5.02 | 3,356 | 4.58 | 2,451 | 4.52 | 1,525 | 4.67 | 1,020 |
| 27 | 7.48 | 11,520 | 6.18 | 6,640 | 5.00 | 3,310 | 4.57 | 2,432 | 4.51 | 1,490 | 4.53 | 985 |
| 28 | 8.24 | 10,560 | 6.12 | 6,460 | 4.97 | 3,247 | 4.56 | 2,412 | 4.23 | 1,460 | 4.53 | 960 |
| 29 | 7.68 | 12,360 | 6.04 | 6,220 | 4.95 | 3,205 | 4.48 | 2,256 | 4.10 | 1,430 | 4.20 | 955 |
| 30 | 7.49 | 11,560 | 6.03 | 6,190 | 4.89 | 3,079 | 4.51 | 2,314 | 4.06 | 1,400 | 4.53 | 970 |
| 31 | 7.50 | 11,600 | 6.05 | 6,250 | ..... | ..... | 4.54 | 2,373 | ..... | ..... | 4.78*a* | 1,010 |

*a–a* Chain gauge and ice conditions.
*b–b* Auto gauge.

MONTHLY DISCHARGE of Bow River at Calgary, for 1915.

(Drainage area 3,113 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 1,320 | 1,050 | 1,225 | 0.394 | 0.45 | 75,323 |
| February | 1,267 | 1,150 | 1,197 | 0.385 | 0.40 | 66,478 |
| March | 1,504 | 1,280 | 1,400 | 0.450 | 0.52 | 86,083 |
| April | 1,993 | 1,194 | 1,605 | 0.516 | 0.58 | 95,504 |
| May | 5,790 | 2,480 | 4,459 | 1.432 | 1.66 | 274,173 |
| June | 28,130 | 5,460 | 10,440 | 3.354 | 3.74 | 621,223 |
| July | 18,590 | 10,560 | 14,470 | 4.648 | 5.36 | 889,725 |
| August | 11,560 | 6,190 | 8,305 | 2.668 | 3.08 | 510,655 |
| September | 6,280 | 3,079 | 4,115 | 1.322 | 1.48 | 244,860 |
| October | 3,058 | 2,256 | 2,680 | 0.861 | 0.99 | 164,787 |
| November | 2,373 | 1,400 | 1,746 | 0.561 | 0.63 | 103,894 |
| December | 1,485 | 955 | 1,269 | 0.408 | 0.47 | 78,028 |
| The year | ..... | ..... | ..... | ..... | 19.36 | 3,210,733 |

ELBOW RIVER AT FULLERTON'S RANCH.

*Location.*—On the NW. ¼ Sec. 12, Tp. 23, Rge. 5, W. 5th Mer., at E. R. Fullerton's ranch, thirty-five miles southwest of Calgary.

*Records available.*—September 29, 1914, to December 31, 1915.

*Gauge.*—Vertical staff on right bank. Zero elevation maintained at 90.83 feet during 1914 and January, 1915. Standard chain on log traffic bridge about 300 feet downstream from staff. Zero elevation maintained at 85.40 feet during 1914 and from January 1 to June 26, 1915. Vertical staff on left bank opposite staff on right bank. Zero elevation maintained at 90.83 feet from July 20 to December 31, 1915.

*Bench-mark.*—Tree stump on right bank. Assumed elevation, 100.00 feet. Permanent iron, on left bank near staff. Elevation, 100.00 feet, same as above. Assumed datum.

*Channel.*—Boulders, fairly permanent.

*Discharge measurements.*—Made by wading or from bridge.

*Flood.*—Bridge and all gauges carried away on June 26, 1915. Maximum staff gauge height from high water mark 7.53 feet, with corresponding discharge of 11,300 sec-ft., estimated from slope measurements.

*Observer.*—E. R. Fullerton.

DISCHARGE MEASUREMENTS of Elbow River at Fullerton's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 26 | H. S. Kerby | 65.0 | 91.0 | 0.80 | 3.30*c* | 73 |
| Feb. 19 | H. W. Rowley | 70.0 | 105.4 | 1.28 | 3.36*c* | 135 |
| Mar. 11 | R. J. McGuinness | 64.0 | 96.0 | 1.53 | 3.46*c* | 145 |
| Mar. 30 | do | 60.0 | 63.0 | 2.00 | 1.90*c* | 126 |
| April 17 | do | 60.0 | 72.2 | 1.74 | 2.12*c* | 126 |
| June 15 | H. B. R. Thompson | 66.0 | 194.5 | 7.08 | 4.61*c* | 1,378 |
| June 26 | do | ..... | 948.3 | 11.92 | 7.53*s* | 11,299*a* |
| July 29 | do | 105.5 | 228.8 | 6.00 | 3.11*s* | 1,372 |
| Aug. 30 | do | 102.5 | 139.2 | 3.59 | 1.70*s* | 500 |
| Sept. 27 | do | 103.0 | 155.0 | 4.25 | 1.78*s* | 660 |
| Nov. 2 | F. K. Beach | 97.3 | 111.0 | 3.18 | 1.44*s* | 351 |
| Dec. 14 | do | 85.0 | 110.0 | 2.12 | 1.81*s* | 233 |

*a* Slope measurement.
*c* Chain gauge.
*s* Staff gauge.

DAILY GAUGE HEIGHT AND DISCHARGE of Elbow River at Fullerton's Ranch, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.44*a* | 128 | 3.35 | 60 | 3.47 | 145 | 1.88 | 125 | 2.51 | 246 | 4.54 | 1,327 |
| 2 | 2.39 | 130 | 3.61 | 60 | 3.47 | 145 | 1.92 | 125 | 3.06 | 462 | 4.56 | 1,341 |
| 3 | 2.41 | 131 | 3.64 | 60 | 3.37 | 145 | 1.92 | 125 | 3.26 | 553 | 4.66 | 1,415 |
| 4 | 2.42 | 132 | 3.56 | 61 | 3.07 | 145 | 1.93 | 125 | 3.29 | 567 | 4.66 | 1,415 |
| 5 | 2.40 | 132 | 3.52 | 62 | 3.07 | 145 | 1.95 | 125 | 3.36 | 602 | 4.66 | 1,415 |
| 6 | 2.40 | 133 | 3.52 | 64 | 3.08 | 145 | 1.98 | 125 | 3.56 | 708 | 4.91 | 1,630 |
| 7 | 2.40 | 133 | 3.52 | 67 | 3.28 | 145 | 2.04 | 125 | 3.79 | 841 | 4.80 | 1,530 |
| 8 | 2.38 | 133 | 3.44 | 70 | 3.32 | 145 | 2.03 | 125 | 4.21 | 1,104 | 4.66 | 1,415 |
| 9 | 2.37 | 133 | 3.46 | 74 | 3.68 | 145 | 2.03 | 125 | 4.51 | 1,305 | 4.66 | 1,415 |
| 10 | 2.37 | 133 | 3.47 | 78 | 3.11 | 145 | 2.04 | 125 | 4.46 | 1,270 | 4.61 | 1,378 |
| 11 | 2.33 | 132 | 3.47 | 83 | 3.12 | 145 | 2.04 | 125 | 4.46 | 1,270 | 4.66 | 1,415 |
| 12 | 2.33 | 131 | 3.34 | 87 | 3.14 | 145 | 2.05 | 125 | 4.01 | 974 | 4.66 | 1,415 |
| 13 | 2.63 | 130 | 3.39 | 92 | 3.15 | 144 | 2.07 | 125 | 4.04 | 994 | 4.66 | 1,415 |
| 14 | 2.46 | 128 | 3.64 | 97 | 3.15 | 144 | 2.09 | 125 | 4.06 | 1,006 | 4.66 | 1,415 |
| 15 | 2.45 | 127 | 3.67 | 104 | 3.15 | 143 | 2.09 | 125 | 4.06 | 1,006 | 4.66 | 1,415 |
| 16 | 2.63 | 125 | 3.62 | 113 | 3.15 | 142 | 2.07 | 126 | 4.06 | 1,006 | 4.66 | 1,415 |
| 17 | 2.66 | 122 | 3.37 | 121 | 1.99 | 141 | 2.06 | 126 | 4.11 | 1,038 | 5.16 | 1,890 |
| 18 | 2.66 | 120 | 3.57 | 129 | 1.87 | 141 | 2.06 | 126*a* | 4.06 | 1,006 | 5.06 | 1,783 |
| 19 | 2.61 | 115 | 3.42 | 135 | 1.99 | 140 | 2.17 | 144 | 4.14 | 1,058 | 5.06 | 1,783 |
| 20 | 2.57 | 109 | 3.38 | 137 | 1.99 | 139 | 2.16 | 141 | 4.21 | 1,104 | 5.04 | 1,762 |
| 21 | 2.45 | 102 | 3.57 | 137 | 1.91 | 138 | 2.16 | 141 | 4.26 | 1,136 | 5.01 | 1,730 |
| 22 | 3.30*b* | 92 | 3.57 | 139 | 1.97 | 137 | 2.22 | 158 | 4.11 | 1,038 | 4.96 | 1,680 |
| 23 | 3.31 | 83 | 3.47 | 140 | 1.99 | 136 | 2.15 | 138 | 4.31 | 1,169 | 4.92 | 1,640 |
| 24 | 3.31 | 78 | 3.46 | 141 | 1.96 | 135 | 2.26 | 169 | 4.76 | 1,496 | 4.86 | 1,584 |
| 25 | 3.32 | 74 | 3.48 | 142 | 1.89 | 134 | 2.27 | 172 | 5.16 | 1,890 | 5.77*b* | 2,714 |
| 26 | 3.33 | 73 | 3.45 | 143 | 1.89 | 133 | 2.27 | 172 | 5.33 | 2,084 | .....*d* | ..... |
| 27 | 3.33 | 71 | 3.46 | 144 | 1.89 | 132 | 2.27 | 172 | 4.84 | 1,566 | ..... | ..... |
| 28 | 3.36 | 69 | 3.46 | 144 | 1.91 | 130 | 2.29 | 177 | 4.86 | 1,584 | ..... | ..... |
| 29 | 3.34 | 66 | ..... | ..... | 1.89 | 128 | 2.36 | 198 | 4.06 | 1,006 | ..... | ..... |
| 30 | 3.35 | 64 | ..... | ..... | 1.86 | 126 | 2.41 | 213 | 4.51 | 1,305 | ..... | ..... |
| 31 | 3.35 | 62 | ..... | ..... | 1.88 | 125 | ..... | ..... | 4.51 | 1,305 | ..... | ..... |

*a–a* Ice conditions.
*b–b* Chain gauge
*d* No gauge from June 25 to July 20.

DAILY GAUGE HEIGHT AND DISCHARGE of Elbow River at Fullerton's Ranch, for 1915.
—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.26 | 823 | 1.67 | 476 | 1.72 | 504 | 1.45*c* | 356 | 1.89 | 232 |
| 2 | ..... | ..... | 2.21 | 792 | 1.64 | 459 | 1.72 | 504 | 1.46*c* | 361 | 1.94 | 232 |
| 3 | ..... | ..... | 2.17 | 768 | 1.64 | 459 | 1.71 | 499 | 1.44*c* | 352 | 1.74 | 231 |
| 4 | ..... | ..... | 2.15 | 755 | 1.66 | 471 | 1.71 | 499 | 1.43*c* | 346 | 1.84 | 225 |
| 5 | ..... | ..... | 2.11 | 731 | 1.68 | 482 | 1.71 | 499 | 1.42*c* | 340 | 1.25 | 210 |
| 6 | ..... | ..... | 2.01 | 671 | 1.83 | 566 | 1.69 | 487 | 1.40*c* | 330 | 1.25 | 204 |
| 7 | ..... | ..... | 1.97 | 647 | 1.77 | 532 | 1.69 | 487 | 1.39 | 325 | 1.25 | 202 |
| 8 | ..... | ..... | 1.91 | 611 | 1.75 | 521 | 1.68 | 482 | 1.38 | 320 | 1.25 | 202 |
| 9 | ..... | ..... | 1.89 | 599 | 1.71 | 499 | 1.67 | 476 | 1.37 | 314 | 1.25 | 205 |
| 10 | ..... | ..... | 1.86 | 583 | 1.70 | 493 | 1.66 | 471 | 1.37 | 314 | 1.25 | 208 |
| 11 | ..... | ..... | 1.81 | 555 | 1.66 | 471 | 1.65 | 465 | 1.44*b* | 310 | 1.66 | 212 |
| 12 | ..... | ..... | 1.76 | 527 | 1.63 | 454 | 1.64 | 459 | 1.44 | 305 | 1.66 | 221 |
| 13 | ..... | ..... | 1.76 | 527 | 1.60 | 437 | 1.64 | 459 | 1.44 | 299 | 1.71 | 230 |
| 14 | ..... | ..... | 1.71 | 499 | 1.63 | 454 | 1.63 | 454 | 1.39 | 292 | 1.77 | 233 |
| 15 | ..... | ..... | 1.71 | 499 | 1.62 | 448 | 1.62 | 448 | 1.34 | 285 | 1.91 | 234 |
| 16 | ..... | ..... | 1.71 | 499 | 1.62 | 448 | 1.61 | 443 | 1.39 | 277 | 2.01 | 233 |
| 17 | ..... | ..... | 1.72 | 504 | 1.62 | 448 | 1.60 | 437 | 1.44 | 271 | 2.31 | 226 |
| 18 | ..... | ..... | 1.72 | 504 | 1.75 | 521 | 1.58 | 426 | 1.34 | 266 | 2.31 | 214 |
| 19 | ..... | ..... | 1.77 | 532 | 1.78 | 538 | 1.56 | 415 | 1.44 | 261 | 2.57 | 197 |
| 20 | 2.50*a* | 972 | 2.37 | 891 | 1.73 | 510 | 1.55 | 410 | 1.44 | 257 | 3.02 | 179 |
| 21 | 2.50 | 972 | 2.17 | 768 | 1.70 | 493 | 1.53 | 398 | 1.34 | 253 | 3.24 | 165 |
| 22 | 2.48 | 960 | 1.87 | 588 | 1.67 | 476 | 1.52 | 393 | 1.39 | 249 | 3.24 | 155 |
| 23 | 2.45 | 941 | 1.82 | 560 | 1.62 | 448 | 1.50 | 382 | 1.39 | 245 | 3.25 | 145 |
| 24 | 2.45 | 941 | 1.80 | 549 | 1.76 | 527 | 1.49 | 377 | 1.29 | 242 | 3.28 | 139 |
| 25 | 2.45 | 941 | 1.77 | 532 | 1.82 | 560 | 1.49 | 377 | 1.39 | 239 | 3.28 | 131 |
| 26 | 2.45 | 941 | 1.72 | 504 | 1.80 | 549 | 1.48 | 372 | 1.39 | 237 | 3.31 | 123 |
| 27 | 2.46 | 947 | 1.72 | 504 | 1.78 | 538 | 1.47 | 366 | 1.44 | 236 | 3.25 | 116 |
| 28 | 2.50 | 972 | 1.72 | 504 | 1.87 | 588 | 1.47 | 366 | 1.49 | 234 | 3.28 | 112 |
| 29 | 2.49 | 966 | 1.72 | 504 | 1.76 | 527 | 1.47 | 366 | 1.54 | 233 | 3.34 | 107 |
| 30 | 2.32 | 860 | 1.68 | 482 | 1.75 | 521 | 1.47 | 366 | 1.84 | 233 | 2.94 | 105 |
| 31 | 2.30 | 848 | 1.68 | 482 | ..... | ..... | 1.46 | 361 | ..... | ..... | 2.79*d* | 104 |

*a–d* Staff gauge.
*b–d* Ice conditions.
*c* Interpolated.

MONTHLY DISCHARGE of Elbow River at Fullerton's Ranch, for 1915.

(Drainage area 254 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 133 | 62 | 109 | 0.429 | 0.49 | 6,792 |
| February | 144 | 60 | 103 | 0.406 | 0.42 | 5,250 |
| March | 145 | 125 | 140 | 0.551 | 0.64 | 8,608 |
| April | 213 | 125 | 142 | 0.559 | 0.62 | 8,436 |
| May | 2,084 | 246 | 1,087 | 4.280 | 4.93 | 66,847 |
| June (1–25) | 2,714 | 1,327 | 1,573 | 6.193 | 5.76 | 77,081 |
| July (20–31) | 972 | 848 | 938 | [illegible] | [illegible] | [illegible] |
| August | 891 | 482 | 597 | 2.351 | 2.71 | 36,738 |
| September | 588 | 437 | 497 | 1.957 | 2.19 | 29,474 |
| October | 504 | 361 | 434 | 1.709 | 1.97 | 26,684 |
| November | 361 | 283 | 286 | 1.126 | 1.30 | 17,618 |
| December | 234 | 104 | 185 | 0.728 | 0.84 | 11,[illegible] |
| The year | | | | | 22.48 | 317,[illegible] |

ELBOW RIVER AT CALGARY.

*Location.*—On the SW. ¼ Sec. 14, Tp. 24, Rge. 1, W. 5th Mer., at city corporation yard, foot of Thirteenth Avenue East, Calgary.

*Records available.*—May 8, 1908 to Dec. 31, 1915.

*Gauge*—Standard chain on Twelfth Avenue bridge. Elevation of zero maintained at 3,404.82 feet during 1915. Vertical staff at metering section 700 feet upstream from bridge. Elevation of zero maintained at 3,406.95 during 1915.

*Bench-marks.*—(1) Permanent iron bench-mark on left bank near cable station. Elevation 3,423.85 feet above mean sea level. (Geodetic Surveys of Canada.) (2) Permanent bench-mark on corner of wing wall of left abutment of traffic bridge at Twelfth Avenue, East. Elevation, 3,420.07 feet above mean sea level. (Geodetic Surveys of Canada.)

*Channel.*—Composed of coarse gravel and boulders, liable to shift and affected by back-water from the Bow River during flood stages of that stream.

*Discharge measurements.*—Made from a cable car, or in low water by wading.

*Flood.*—June 26, maximum staff gauge height, 10.40 feet, with corresponding discharge of 13,450 sec.-ft.

*Observer.*—Mrs. I. S. White.

DISCHARGE MEASUREMENTS of Elbow River at Calgary, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 21 | H. S. Kerby | 105 | 174 | 0.65 | 1.85*c* | 113 |
| Feb. 12 | H. W. Rowley | 100 | 165 | 0.60 | 1.76*c* | 99 |
| Feb. 22 | do | 61 | 54 | 2.14 | 1.77*c* | 115 |
| Mar. 3 | do | 103 | 173 | 0.56 | 1.80*c* | 97 |
| Mar. 23 | R. J. McGuinness | 130 | 317 | 1.26 | 2.32*c* | 401 |
| April 5 | do | 125 | 256 | 0.78 | 2.01*c* | 199 |
| April 27 | do | 112 | 92 | 2.42 | 1.91*c* | 224 |
| May 17 | H. M. Nelson | 145 | 518 | 2.46 | 2.82*s* | 1,272 |
| June 5 | do | 145 | 522 | 2.66 | 2.92*s* | 1,387 |
| June 26 | G. R. Elliott | 144 | 1,245 | 6.60 | 7.70*s* | 8,217 |
| June 26 | do | 144 | 1,471 | 8.01 | 9.46*s* | 11,777 |
| June 27 | do | 144 | 963 | 6.65 | 6.17*s* | 5,825 |
| June 28 | do | 152 | 801 | 4.53 | 4.88*s* | 3,632 |
| June 30 | do | 149 | 694 | 3.75 | 4.09*s* | 2,600 |
| July 3 | do | 148 | 587 | 3.21 | 3.45*s* | 1,882 |
| July 14 | do | 144 | 1,187 | 7.31 | 7.55*s* | 8,676 |
| Aug. 12 | H. M. Nelson | 141 | 362 | 2.31 | 2.10*s* | 838 |
| Sept. 14 | do | 140 | 329 | 1.71 | 1.93*s* | 562 |
| Oct. 19 | do | 141 | 319 | 1.55 | 1.81*s* | 495 |
| Nov. 22 | F. K. Beach | 103 | 154 | 1.70 | 2.02*c* | 262 |
| Dec. 15 | do | 110 | 185 | 1.13 | 2.84*c* | 209 |
| Dec. 31 | do | 100 | 184 | 0.35 | 2.86*c* | 65 |

*s* Staff gauge.
*c* Chain gauge.

PLATE 20

Elbow River in flood at Calgary, on June 26, 1915. Looking downstream at Mission bridge, about two hours before the maximum stage was reached. Note the new concrete arch bridge below the steel truss. Taken by F. H. Peters.

PLATE 21

Elbow River in flood at Calgary, on June 26, 1915. Looking downstream at Canadian Northern Railway bridge, about two hours before the maximum stage was reached. Taken by F. H. Peters.

DAILY GAUGE HEIGHT AND DISCHARGE of Elbow River at Calgary, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.86*a* | 145 | 1.71 | 101 | 1.72 | 101 | 1.86 | 192 | 1.29*f* | 200 | 2.66 | 1,163 |
| 2 | 1.80 | 140 | 1.78 | 101 | 1.73 | 99 | 1.93 | 194 | 1.62*k* | 382 | 2.96 | 1,419 |
| 3 | 1.80 | 142 | 1.79 | 101 | 1.73 | 97 | 1.96 | 196 | 1.94 | 598 | 3.45 | 1,895 |
| 4 | 1.78 | 146 | 1.78 | 101 | 1.74 | 97 | 2.03 | 198 | 1.86 | 542 | 3.02 | 1,474 |
| 5 | 1.78 | 148 | 1.79 | 101 | 1.73 | 97 | 2.07 | 200 | 1.90 | 570 | 2.98 | 1,437 |
| 6 | 1.78 | 148 | 1.79 | 100 | 1.73 | 97 | 1.99 | 203 | 2.01 | 648 | 3.06 | 1,512 |
| 7 | 1.78 | 146 | 1.79 | 100 | 1.73 | 97 | 1.94 | 207 | 2.14 | 747 | 2.93 | 1,392 |
| 8 | 1.78 | 145 | 1.77 | 100 | 1.74 | 97 | 1.92*b* | 211 | 2.79 | 1,267 | 3.22 | 1,665 |
| 9 | 1.79 | 146 | 1.75 | 100 | 1.74 | 98 | 1.84 | 216 | 2.97 | 1,428 | 3.09 | 1,540 |
| 10 | 1.82 | 144 | 1.76 | 100 | 1.69 | 98 | 1.84 | 216 | 2.75 | 1,235 | 2.89 | 1,356 |
| 11 | 1.88 | 145 | 1.79 | 100 | 1.68 | 99 | 1.82 | 208 | 2.58 | 1,099 | 2.81 | 1,284 |
| 12 | 1.85 | 144 | 1.69 | 99 | 1.74 | 100 | 1.83 | 212 | 2.26 | 843 | 2.78 | 1,259 |
| 13 | 1.79 | 143 | 1.71 | 101 | 1.78 | 102 | 1.84 | 216 | 2.19 | 787 | 2.82 | 1,293 |
| 14 | 1.70 | 140 | 1.93 | 108 | 1.78 | 103 | 1.87 | 228 | 3.36 | 1,8[illegible]5 | 2.90 | 1,365 |
| 15 | 1.66 | 138 | 1.75 | 108 | 1.78 | 104 | 1.87 | 228 | 3.17 | 1,616 | 2.97 | 1,428 |
| 16 | 1.65 | 134 | 1.73 | 106 | 1.80 | 106 | 1.85 | 220 | 2.95 | 1,410 | 3.10 | 1,550 |
| 17 | 1.70 | 123 | 1.74 | 106 | 1.84 | 108 | 1.83 | 212 | 2.86 | 1,329 | 3.20 | 1,645 |
| 18 | 1.76 | 112 | 1.74 | 106 | 1.84 | 109 | 1.82 | 208 | 2.79 | 1,267 | 3.29 | 1,735 |
| 19 | 1.80 | 108 | 1.74 | 107 | 1.84 | 112 | 1.81 | 204 | 2.72 | 1,211 | 3.42 | 1,865 |
| 20 | 1.79 | 109 | 1.74 | 112 | 2.14 | 180 | 1.81 | 204 | 2.63 | 1,139 | 3.47 | 1,915 |
| 21 | 1.85 | 113 | 1.80 | 117 | 2.33 | 256 | 1.82 | 208 | 2.74 | 1,227 | 3.26 | 1,705 |
| 22 | 1.84 | 113 | 1.77 | 115 | 2.40 | 330 | 1.92 | 248 | 2.79 | 1,267 | 3.09 | 1,540 |
| 23 | 1.83 | 112 | 1.76 | 112 | 2.33 | 401 | 1.86 | 224 | 3.01 | 1,464 | 3.03 | 1,484 |
| 24 | 1.80 | 110 | 1.68 | 110 | 2.30 | 340 | 1.87 | 228 | 3.16 | 1,607 | ..... | 1,552*d* |
| 25 | 1.77 | 108 | 1.69 | 108 | 2.11 | 272 | 1.89 | 236 | 3.56 | 2,005 | ..... | 2,277 |
| 26 | 1.70 | 107 | 1.70 | 106 | 1.82 | 208 | 1.92 | 248 | 3.40 | 1,845 | ..... | 8,427 |
| 27 | 1.66 | 105 | 1.72 | 104 | 1.76 | 192 | 1.89 | 236 | 3.35 | 1,795 | ..... | 7,068 |
| 28 | 1.65 | 104 | 1.72 | 103 | 1.81 | 188 | 1.91 | 244 | 3.19 | 1,636 | ..... | 3,960 |
| 29 | 1.65 | 102 | ..... | ..... | 1.80 | 188 | 1.93 | 252 | 3.09 | 1,540 | ..... | 2,995*d* |
| 30 | 1.64 | 100 | ..... | ..... | 1.78 | 188 | 1.92*c* | 248 | 2.95 | 1,410 | 4.11 | 2,618*f* |
| 31 | 1.66 | 99 | ..... | ..... | 1.82 | 190 | ..... | ..... | 2.75 | 1,235 | ..... | ..... |

*a* to *b* Ice conditions.
*a* to *c* Chain gauge.
*d* to *d* Average of hourly discharge. Flood tables No. D 5.
*k* Gauge heights Interpolated.
*f–f* Staff gauge.

DAILY GAUGE HEIGHT AND DISCHARGE of Elbow River at Calgary, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 4.04*c* | 2,533 | 3.16 | 1,607 | 1.86 | 542 | 2.04 | 670 | 1.69 | 424 | 2.14 | 229 |
| 2 | 3.54 | 1,985 | 3.01 | 1,464 | 1.85 | 535 | 2.06 | 685 | 1.66 | 406 | 2.28 | 228 |
| 3 | 3.46 | 1,905 | 2.83 | 1,302 | 1.87 | 549 | 2.11 | 723 | 1.65 | 400 | 2.25 | 228 |
| 4 | 3.33 | 1,775 | 2.71 | 1,203 | 1.89 | 563 | 2.08 | 700 | 1.63 | 388 | 2.20 | 226 |
| 5 | 3.39 | 1,835 | 2.60 | 1,115 | 1.91 | 577 | 2.06 | 685 | 1.61 | 376 | 2.21 | 224 |
| 6 | 3.41 | 1,855 | 2.51 | 1,043 | 1.89 | 563 | 2.05 | 678 | 1.61 | 376 | 2.23 | 222 |
| 7 | 3.42 | 1,865 | 2.40 | 955 | 2.08 | 700 | 2.02 | 655 | 1.60*c* | 370 | 2.23 | 221 |
| 8 | 3.34 | 1,785 | 2.29 | 867 | 2.02 | 655 | 1.96 | 612 | ..... | 340*a* | 2.23 | 219 |
| 9 | 3.16 | 1,607 | 2.24 | 827 | 2.07 | 692 | 1.95 | 605 | ..... | 316 | 2.19 | 216 |
| 10 | 3.00 | 1,455 | 2.20 | 795 | 2.07 | 692 | 1.93 | 591 | ..... | 296*a* | 2.20 | 214 |
| 11 | 2.81 | 1,284 | 2.14 | 447 | 1.95 | 605 | 1.93 | 591 | 1.95*b* | 290 | 2.33 | 213 |
| 12 | 2.74 | 1,227 | 2.08 | 700 | 1.96 | 612 | 1.91 | 577 | 1.94 | 286 | 2.40 | 212 |
| 13 | 2.71 | 1,203 | 2.02 | 655 | 1.92 | 684 | 1.91 | 577 | 1.99 | 281 | 2.46 | 210 |
| 14 | 5.13 | 4,033 | 2.12 | 731 | 1.87 | 549 | 1.91 | 577 | 2.12 | 280 | ..... | 209 |
| 15 | 4.36 | 2,933 | 2.05 | 678 | 1.90 | 570 | 1.91 | 577 | 2.09 | 277 | 2.85 | 208 |
| 16 | 4.19 | 2,718 | 2.04 | 670 | 1.86 | 542 | 1.90 | 570 | 2.05 | 274 | 2.87 | 207 |
| 17 | 4.41 | 2,998 | 1.99 | 633 | 1.84 | 528 | 1.89 | 563 | 2.04 | 272 | 2.94 | 206 |
| 18 | 4.49 | 3,102 | 1.98 | 626 | 1.84 | 528 | 1.88 | 556 | 2.03 | 270 | 2.72 | 205 |
| 19 | 3.84 | 2,304 | 2.12 | 731 | 2.07 | 692 | 1.81 | 507 | 1.96 | 267 | 2.54 | 204 |
| 20 | 3.60 | 2,045 | 3.59 | 2,035 | 1.95 | 605 | 1.83 | 521 | 1.92 | 265 | 2.49 | 202 |
| 21 | 3.29 | 1,735 | 3.05 | 1,502 | 1.94 | 598 | 1.83 | 521 | 1.88 | 264 | 2.49 | 196 |
| 22 | 3.17 | 1,616 | 2.68 | 1,179 | 2.01 | 648 | 1.82 | 514 | 2.02 | 264 | 2.49 | 190 |
| 23 | 3.10 | 1,550 | 2.45 | 995 | 2.17 | 771 | 1.82 | 514 | 2.11 | 261 | 2.44 | 184 |
| 24 | 3.06 | 1,512 | 2.31 | 883 | 2.39 | 947 | 1.79 | 493 | 2.03 | 259 | 2.39 | 172 |
| 25 | 2.95 | 1,410 | 2.26 | 843 | 2.32 | 891 | 1.76 | 472 | 2.01 | 256 | 2.34 | 152 |
| 26 | 2.88 | 1,347 | 2.14 | 747 | 2.25 | 835 | 1.71 | 437 | 2.02 | 253 | 2.32 | 134 |
| 27 | 2.82 | 1,293 | 1.84 | 528 | 2.21 | 803 | 1.70 | 430 | 2.06 | 251 | 2.50 | 116 |
| 28 | 3.16 | 1,607 | 2.01 | 648 | 2.17 | 771 | 1.69 | 424 | 1.95 | 246 | 2.68 | 101 |
| 29 | 3.31 | 1,755 | 1.93 | 591 | 2.11 | 723 | 1.69 | 424 | 1.98 | 240 | 2.87 | 080 |
| 30 | 3.50 | 1,945 | 1.88 | 556 | 2.08 | 700 | 1.69 | 424 | 2.00 | 234 | 3.14 | 069 |
| 31 | 3.16 | 1,607 | 1.87 | 549 | ..... | ..... | 1.69 | 424 | ..... | ..... | 2.87*b* | 065 |

*a-a.* Discharges interpolated.
*b-b* Ice conditions and chain gauge.
*c-c* Staff gauge.

MONTHLY DISCHARGE of Elbow River at Calgary, for 1915.

(Drainage area 474 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 148 | 99 | 126 | 0.266 | 0.31 | 7,747 |
| February | 117 | 99 | 105 | 0.222 | 0.23 | 5,831 |
| March | 401 | 97 | 157 | 0.331 | 0.38 | 9,654 |
| April | 252 | 192 | 218 | 0.460 | 0.51 | 12,972 |
| May | 2,005 | 200 | 1,198 | 2.530 | 2.92 | 73,662 |
| June | 8,427 | 1,163 | 2,127 | 4.490 | 5.01 | 126,565 |
| July | 4,033 | 1,203 | 1,930 | 4.070 | 4.69 | 118,670 |
| August | 2,035 | 447 | 907 | 1.910 | 2.20 | 55,769 |
| September | 947 | 528 | 656 | 1.380 | 1.54 | 39,035 |
| October | 723 | 424 | 558 | 1.180 | 1.36 | 34,310 |
| November | 424 | 234 | 299 | 0.631 | 0.70 | 17,792 |
| December | 229 | 65 | 186 | 0.392 | 0.45 | 11,437 |
| The year | ..... | ..... | ..... | ..... | 20.30 | 513,444 |

## NOSE CREEK AT CALGARY.

*Location.*—On the NW. ¼ Sec. 13, Tp. 24, Rge. 1, W. 5th Mer., on wooden traffic bridge near mouth of Nose Creek.

*Records available.*—April 24, 1911, to October 31, 1915.

*Gauge.*—Vertical staff set on central abutment of bridge on upstream side. Elevation of zero maintained at 92.81 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark on left bank near end of bridge. Assumed elevation, 100.00 feet.

*Channel.*—Fairly permanent.

*Discharge measurements.*—Made from bridge or by wading.

*Floods.*—June 26, 1915, maximum gauge height was 6.85 feet caused partly by backwater from the Bow River. August 20, 1915, gauge height was 5.60 feet with a corresponding maximum discharge of 1,935 sec.-feet.

*Observer.*—C. A. Lang.

### Discharge Measurements of Nose Creek at Calgary, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq.-ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 7 | R. J. McGuinness | 21.0 | 8.6 | 1.43 | 1.80 | 12.3 |
| April 27 | do | 22.5 | 10.6 | 0.91 | 1.71 | 9.6 |
| May 19 | H. M. Nelson | 24.0 | 39.5 | 2.35 | 2.24 | 93.0 |
| June 7 | do | 23.5 | 30.5 | 1.59 | 1.95 | 48.0 |
| July 15 | do | 123.0 | 210.3 | 2.35 | 3.40 | 549.0 |
| July 29 | G. H. Whyte, H. M. Nelson | 157.5 | 406.1 | 2.75 | 4.31 | 1,118.0 |
| Aug. 13 | H. M. Nelson | 64.0 | 98.2 | 0.88 | 2.24 | 87.0 |
| Sept. 13 | do | 113.0 | 142.5 | 1.31 | 2.39 | 187.0 |

### Daily Gauge Height and Discharge of Nose Creek at Calgary, for 1915.

| Day. | April. | | May. | | June. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft* | *Feet.* | *Sec.-ft* |
| 1 | 1.83 | 21 | 1.70 | 9 | 1.85 | 23 |
| 2 | 1.83 | 21 | 1.70 | 9 | 1.95 | 35 |
| 3 | 1.85 | 23 | 1.70 | 9 | 2.12 | 64 |
| 4 | 1.85 | 23 | 1.68 | 8 | 2.14 | 68 |
| 5 | 1.85 | 23 | 1.68 | 8 | 2.10 | 60 |
| 6 | 1.84 | 22 | 1.67 | 7 | 2.06 | 53 |
| 7 | 1.80 | 18 | 1.71 | 9 | 1.96 | 37 |
| 8 | 1.83 | 21 | 1.71 | 9 | 1.93 | 32 |
| 9 | 1.78 | 16 | 1.70 | 9 | 1.85 | 23 |
| 10 | 1.72 | 10 | 1.71 | 9 | 1.85 | 23 |
| 11 | 1.70 | 9 | 1.67 | 7 | 1.85 | [illegible] |
| 12 | 1.68 | 8 | 1.66 | 7 | 1.85 | [illegible] |
| 13 | 1.70 | 9 | 1.72 | 10 | 1.85 | 23 |
| 14 | 1.70 | 9 | 1.90 | 28 | 1.85 | [illegible] |
| 15 | 1.68 | 8 | 2.11 | 61 | 1.85 | [illegible] |
| 16 | 1.67 | 7 | 2.22 | 83 | 1.83 | 21 |
| 17 | 1.68 | 8 | 2.52 | 166 | 1.[illegible] | 28 |
| 18 | 1.68 | 8 | 2.30 | 104 | 1.[illegible] | [illegible] |
| 19 | 1.66 | 7 | 2.25 | 92 | 2.15 | [illegible] |
| 20 | 1.68 | 8 | 2.22 | 83 | 2.12 | [illegible] |
| 21 | 1.75 | 13 | 2.08 | 56 | 2.09 | [illegible] |
| 22 | 1.70 | 9 | 1.90 | 28 | 2.04 | 48 |
| 23 | 1.65 | 6 | 1.90 | 28 | 2.01 | 43 |
| 24 | 1.65 | 6 | 1.90 | 28 | 1.[illegible] | 37 |
| 25 | 1.65 | 6 | 1.98 | 35 | 2.38 | 1[illegible] |
| 26 | 1.65 | 6 | 1.9[illegible] | 32 | 4.78 | 1,041[illegible] |
| 27 | 1.68 | 8 | 1.87 | 25 | 4.[illegible] | [illegible] |
| 28 | 1.65 | 6 | 1.84 | 22 | 4.85 | [illegible] |
| 29 | 1.68 | 8 | 1.82 | 20 | 4.[illegible] | [illegible] |
| 30 | 1.68 | 8 | 1.82 | 20 | 3.19 | [illegible] |
| 31 | | | 1.80 | 18 | | |

*a* Gauge affected by backwater.

DAILY GAUGE HEIGHT AND DISCHARGE of Nose Creek at Calgary, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.92 | 305 | 3.65 | 693 | 2.38 | 125 | 2.36 | 120 |
| 2 | 2.65 | 204 | 3.05 | 364 | 2.35 | 117 | 2.35 | 117 |
| 3 | 2.50 | 158 | 2.85 | 277 | 2.33 | 112 | 2.39 | 127 |
| 4 | 2.30 | 104 | 2.74 | 235 | 2.33 | 112 | 2.45 | 144 |
| 5 | 2.20 | 80 | 2.63 | 194 | 2.34 | 114 | 2.42 | 136 |
| 6 | 2.16 | 72 | 2.55 | 173 | 2.35 | 117 | 2.40 | 130 |
| 7 | 2.15 | 70 | 2.43 | 138 | 2.36 | 120 | 2.38 | 125 |
| 8 | 2.14 | 68 | 2.38 | 125 | 2.43 | 138 | 2.36 | 120 |
| 9 | 2.10 | 60 | 2.36 | 120 | 2.45 | 144 | 2.34 | 114 |
| 10 | 2.04 | 49 | 2.34 | 114 | 2.42 | 136 | 2.34 | 114 |
| 11 | 1.90 | 28 | 2.30 | 104 | 2.40 | 130 | 2.34 | 114 |
| 12 | 1.85 | 23 | 2.25 | 92 | 2.40 | 130 | 2.34 | 114 |
| 13 | 1.92 | 31 | 2.25 | 92 | 2.40 | 130 | 2.34 | 114 |
| 14 | 3.71 | 729 | 2.25 | 92 | 2.40 | 130 | 2.34 | 114 |
| 15 | 3.13 | 403 | 2.25 | 92 | 2.40 | 130 | 2.34 | 114 |
| 16 | 3.03 | 354 | 2.25 | 92 | 2.40 | 130 | 2.32 | 109 |
| 17 | 3.38 | 535 | 2.24 | 90 | 2.42 | 133 | 2.32 | 109 |
| 18 | 3.25 | 464 | 2.27 | 97 | 2.38 | 125 | 2.30 | 104 |
| 19 | 3.32 | 501 | 2.28 | 99 | 2.38 | 125 | 2.30 | 104 |
| 20 | 3.23 | 454 | 5.60 | 1,935 | 2.38 | 125 | 2.30 | 104 |
| 21 | 3.05 | 364 | 5.13 | 1,634 | 2.36 | 120 | 2.30 | 104 |
| 22 | 2.69 | 217 | 4.93 | 1,506 | 2.39 | 127 | 2.28 | 99 |
| 23 | 2.65 | 204 | 3.48 | 592 | 2.38 | 125 | 2.27 | 97 |
| 24 | 2.62 | 194 | 3.05 | 364 | 2.60 | 188 | 2.26 | 94 |
| 25 | 2.53 | 167 | 2.91 | 300 | 2.74 | 235 | 2.26 | 94 |
| 26 | 2.45 | 144 | 2.76 | 243 | 2.63 | 198 | 2.26 | 94 |
| 27 | 2.35 | 117 | 2.66 | 207 | 2.53 | 167 | 2.23 | 87 |
| 28 | 2.88 | 288 | 2.56 | 176 | 2.48 | 152 | 2.23 | 87 |
| 29 | 4.25 | 1,071 | 2.49 | 155 | 2.45 | 144 | 2.22 | 85 |
| 30 | 4.49 | 1,225 | 2.45 | 144 | 2.39 | 127 | 2.20 | 80 |
| 31 | 4.14 | 1,001 | 2.40 | 130 | ..... | ..... | 2.20 | 80 |

MONTHLY DISCHARGE of Nose Creek at Calgary, for 1915.

(Drainage area 294 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage area | Total in Acre-feet. |
| April (1-30) | 23 | 6 | 11.8 | 0.040 | 0.05 | 702 |
| May | 166 | 7 | 34.0 | 0.116 | 0.13 | 2,091 |
| June | 1,011 | 21 | 140.0 | 0.476 | 0.53 | 8,330 |
| July | 1,225 | 23 | 312.0 | 1.060 | 1.22 | 19,185 |
| August | 1,935 | 90 | 344.0 | 1.170 | 1.35 | 21,153 |
| September | 235 | 112 | 137.0 | 0.466 | 0.52 | 8,152 |
| October (1-31) | 144 | 80 | 108.0 | 0.367 | 0.42 | 6,641 |
| The period | ..... | ..... | ..... | ..... | 4.22 | 66,254 |

CANADIAN PACIFIC RAILWAY COMPANY CANAL AT OGDEN.

*Location.*—On the NE. ¼ Sec. 21, Tp. 23, Rge. 29, W. 4th Mer., one-half mile south of Ogden Post Office and about six miles below the headgates of the main canal "A."

*Records available.*—May 1, 1911, to September 14, 1915, and at station two miles upstream from May 8, 1908, to October 9, 1910.

*Gauge.*—Vertical staff in wooden bay of C.P.R. automatic gauge cabin on left bank of canal at end of bridge No. 3. Elevation of zero maintained at 86.65 feet during 1915.

*Bench-mark.*—An iron post in left bank and two feet from lower end of left abutment of wooden traffic bridge about one hundred feet downstream from section. Assumed elevation, 100.00 feet.

*Channel.*—Fairly permanent.

*Discharge measurements.*—Made from bridge.

*Observer.*—A. Hatcher.

DISCHARGE MEASUREMENTS of Canadian Pacific Railway Company Canal at Ogden, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq.-ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 19 | H. M. Nelson | 61 | 180.1 | 1.71 | 2.85 | 307 |
| June 8 | do | 59 | 158.6 | 1.53 | 2.57 | 242 |
| July 23 | do | 49 | 76.6 | 0.88 | 1.10 | 67 |
| Aug. 12 | do | 56 | 134.7 | 1.52 | 2.16 | 205 |
| Sept. 14 | do | 55 | 115.5 | 1.33 | 1.93 | 153 |

DAILY GAUGE HEIGHT AND DISCHARGE of Canadian Pacific Railway Company Canal at Ogden, for 1915.

| Day. | May. | | June. | | July. | | August. | | September. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.20 | 195 | 2.25 | 203 | 1.25 | 80 | 2.01 | 167 | 2.09 | 177 |
| 2 | 2.20 | 195 | 2.40 | 227 | 1.53 | 106 | 2.03 | 168 | 2.10 | 179 |
| 3 | 2.20 | 195 | 2.45 | 236 | 1.82 | 139 | 2.05 | 171 | 2.08 | 176 |
| 4 | 2.20 | 195 | 2.50 | 245 | 2.11 | 181 | 2.00 | 164 | 2.06 | 173 |
| 5 | 2.20 | 195 | 2.47 | 240 | 2.40 | 227 | 2.00 | 164 | 2.05 | 171 |
| 6 | 2.40 | 227 | 2.43 | 232 | 5.80 | 840 | 2.00 | 164 | 2.03 | 168 |
| 7 | 2.60 | 263 | 2.40 | 227 | 4.95 | 686 | 1.65 | 118 | 2.00 | 164 |
| 8 | 2.40 | 227 | 2.57 | 259 | 4.10 | 533 | 1.82 | 139 | 1.98 | 161 |
| 9 | 2.37 | 221 | 2.44 | 234 | 4.22 | 555 | 2.00 | 164 | 1.96 | 158 |
| 10 | 2.33 | 216 | 2.30 | 211 | 4.35 | 578 | 2.18 | 192 | 1.95 | 157 |
| 11 | 2.30 | 211 | 2.30 | 211 | 4.28 | 565 | 2.18 | 192 | 1.93 | 154 |
| 12 | 2.30 | 211 | 2.32 | 214 | 4.21 | 553 | 2.18 | 192 | 1.91 | 151 |
| 13 | 2.30 | 211 | 2.34 | 217 | 4.15 | 542 | 2.16 | 189 | 1.90 | 150 |
| 14 | 2.25 | 203 | 2.37 | 222 | 3.80 | 479 | 2.15 | 187 | 1.93 | 154 |
| 15 | 2.42 | 231 | 2.28 | 208 | 3.45 | 416 | 2.13 | 184 | 1.89 | 14[illegible] |
| 16 | 2.59 | 261 | 2.20 | 195 | 3.10 | 353 | 2.10 | 179 | 1.85 | 142 |
| 17 | 2.77 | 294 | 2.12 | 182 | 3.05 | 344 | 2.02 | 167 | 1.83 | 140 |
| 18 | 2.95 | 326 | 2.36 | 221 | 3.55 | 434 | 1.94 | 156 | 1.80 | 136 |
| 19 | 2.85 | 308 | 2.60 | 263 | 4.05 | 524 | 1.87 | 146 | 1.80 | 136 |
| 20 | 3.10 | 353 | 2.85 | 308 | 4.55 | 614 | 1.80 | 136 | 1.80 | 136 |
| 21 | 3.10 | 353 | 3.10 | 353 | 5.05 | 704 | 1.70 | 124 | 1.80 | 136 |
| 22 | 3.20 | 371 | 3.15 | 362 | 3.07 | 348 | 1.75 | 130 | 1.81 | 137 |
| 23 | 3.10 | 353 | 3.20 | 371 | 1.10 | 68 | 1.80 | 136 | 1.82 | 139 |
| 24 | 2.81 | 301 | 3.25 | 380 | 1.13 | 70 | 1.85 | 143 | 1.83 | 140 |
| 25 | 2.52 | 249 | 3.30 | 389 | 1.17 | 74 | 1.90 | 150 | 1.85 | 143 |
| 26 | 2.23 | 200 | 2.95 | 326 | 1.20 | 76 | 1.92 | 153 | 1.85 | 143 |
| 27 | 1.95 | 157 | 2.61 | 265 | 1.65 | 118 | 1.87 | 146 | 1.85 | 143 |
| 28 | 1.98 | 161 | 2.27 | 206 | 2.10 | 179 | 1.80 | 136 | 1.85 | 143 |
| 29 | 2.02 | 167 | 1.93 | 154 | 2.05 | 171 | 1.89 | 149 | ..... | ..... |
| 30 | 2.06 | 173 | 1.59 | 112 | 2.00 | 164 | 1.98 | 161 | ..... | ..... |
| 31 | 2.10 | 179 | ..... | ..... | 2.01 | 165 | 2.08 | 176 | ..... | ..... |

MONTHLY DISCHARGE of Canadian Pacific Railway Company Canal at Ogden, for 1915.

(Drainage area ..... square miles.)

| Month. | Discharge in Second-Feet | | | Run-Off. |
|---|---|---|---|---|
| | Maximum | Minimum | Mean | Total discharge in Acre-feet. |
| May | 371 | 157 | 239 | 14,696 |
| June | 389 | 112 | 249 | 14,817 |
| July | 840 | 68 | 351 | 21,582 |
| August | 192 | 118 | 159 | 9,777 |
| September (1 to 28) | 179 | 136 | 152 | 8,440 |
| The period | ..... | ..... | ..... | 69,312 |

FISH CREEK NEAR PRIDDIS.

*Location.*—On SW. ¼ Sec. 26, Tp. 22, Rge. 3, W. 5th Mer., at the Percival ranch which is about one mile north of Priddis Post Office.

*Records available.*—May 13, 1907, to October 31, 1915.

*Gauge.*—Vertical staff. Zero elevation maintained at 91.24 feet during 1907–10. Zero elevation maintained at 90.81 feet during 1911–15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Not liable to shift except in extreme high water.

*Discharge measurements.*—By wading or from traffic bridge, about one mile upstream or from cable suspension bridge at the station.

*Winter flow.*—Observations discontinued during winter months.

*Flood.*—The largest recorded discharge at this station took place June 26, 1915, when the water elevation was 98.81 feet with an estimated flow of 7,056 sec.-ft.

*Observer.*—Fred Percival.

DISCHARGE MEASUREMENTS of Fish Creek near Priddis, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq.-ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 29 | R. J. McGuinness | 40.0 | 60.0 | 2.00 | 3.45 | 120.0 |
| April 19 | do | 32.0 | 29.9 | 0.54 | 1.12 | 16.2 |
| May 16 | do | 56.0 | 127.8 | 3.63 | 3.29 | 464.0 |
| May 17 | do | 56.0 | 137.2 | 3.87 | 3.44 | 532.0 |
| June 21 | H. B. R. Thompson | 44.0 | 90.2 | 2.84 | 2.55 | 257.0 |
| June 26 | do | ..... | 737.2 | 9.57 | 8.00 | 7,056.0*a* |
| Aug. 5 | do | 36.0 | 52.5 | 2.50 | 2.32 | 131.0 |
| Sept. 4 | do | 48.0 | 74.8 | 0.30 | 1.98 | 22.0 |
| Oct. 6 | do | 48.5 | 56.0 | 1.35 | 2.36 | 75.0 |
| Nov. 8 | F. K. Beach | 29.5 | 38.2 | 0.88 | 1.82 | 34.0 |

*a* Slope estimate.

DAILY GAUGE HEIGHT AND DISCHARGE of Fish Creek near Priddis, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 3.13 | 377.0 | 1.30 | 22 | 1.88 | 58 |
| 2 | ..... | ..... | 3.13 | 377.0 | 1.31 | 22 | 2.15 | 93 |
| 3 | ..... | ..... | 3.38 | 490.0 | 1.80 | 52 | 3.51 | 553 |
| 4 | ..... | ..... | 3.37 | 486.0 | 2.10 | 86 | 3.00 | 324 |
| 5 | ..... | ..... | 3.17 | 395.0 | 1.80 | 52 | 2.78 | 243 |
| 6 | ..... | ..... | 2.74 | 230.0 | 1.81 | 53 | 2.62 | 192 |
| 7 | ..... | ..... | 2.72 | 223.0 | 1.66 | 41 | 2.66 | 204 |
| 8 | ..... | ..... | 1.25 | 20.0 | 1.65 | 40 | 2.68 | 210 |
| 9 | ..... | ..... | 1.25 | 20.0 | 1.54 | 32 | 2.67 | 207 |
| 10 | ..... | ..... | 1.17 | 17.4 | 1.53 | 32 | 2.43 | 145 |
| 11 | ..... | ..... | 1.15 | 17.0 | 1.47 | 29 | 2.32 | 122 |
| 12 | ..... | ..... | 1.12 | 16.4 | 1.42 | 26 | 2.33 | 124 |
| 13 | ..... | ..... | 1.16 | 17.2 | 1.37 | 25 | 2.36 | 130 |
| 14 | ..... | ..... | 1.16 | 17.2 | 3.00 | 324 | 2.34 | 126 |
| 15 | 4.34 | 1,102 | 1.17 | 17.4 | 4.15 | 952 | 2.44 | 147 |
| 16 | 4.37 | 1,126 | 1.16 | 17.2 | 3.41 | 505 | 2.40 | 138 |
| 17 | 4.64 | 1,356 | 1.16 | 17.2 | 3.44 | 519 | 2.40 | 138 |
| 18 | 4.84 | 1,540 | 1.14 | 16.8 | 3.65 | 629 | 3.06 | 348 |
| 19 | 4.64 | 1,356 | 1.14 | 16.8 | 3.41 | 505 | 2.99 | 320 |
| 20 | 4.66 | 1,374 | 1.14 | 16.8 | 3.39 | 495 | 2.93 | 297 |
| 21 | 4.65 | 1,365 | 1.12 | 16.4 | 3.06 | 348 | 2.65 | 201 |
| 22 | 4.55 | 1,275 | 1.11 | 16.2 | 3.06 | 348 | 2.43 | 145 |
| 23 | 4.00 | 846 | 1.08 | 15.6 | 3.00 | 324 | 2.34 | 126 |
| 24 | 4.02 | 860 | 1.21 | 18.4 | 2.63 | 195 | 2.24 | 107 |
| 25 | 3.80 | 718 | 1.21 | 18.4 | 2.74 | 230 | 2.23 | 105 |
| 26 | 3.75 | 688 | 1.16 | 17.2 | 2.63 | 195 | 8.00 | 7,020 |
| 27 | 3.70 | 658 | 1.13 | 16.6 | 2.47 | 153 | 5.00 | 1,710 |
| 28 | 3.50 | 548 | 1.13 | 16.6 | 2.46 | 151 | 5.00 | 1,710 |
| 29 | 3.47 | 534 | 1.10 | 16.0 | 2.16 | 94 | 4.00 | 846 |
| 30 | 3.30 | 452 | 1.10 | 16.0 | 2.13 | 90 | 3.00 | 324 |
| 31 | 3.19 | 404 | ..... | ..... | 1.95 | 66 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Fish Creek near Priddis, for 1915.—*Concluded.*

| DAY. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.00 | 324 | 3.89 | 774 | 1.96 | 67 | 2.35 | 128 |
| 2 | 2.80 | 250 | 3.59 | 595 | 1.96 | 67 | 2.26 | 111 |
| 3 | 3.46 | 529 | 2.93 | 297 | 2.01 | 73 | 2.47 | 153 |
| 4 | 3.37 | 486 | 2.87 | 275 | 1.96 | 67 | 2.45 | 149 |
| 5 | 3.28 | 443 | 2.37 | 132 | 2.52 | 165 | 2.38 | 134 |
| 6 | 3.34 | 471 | 2.53 | 168 | 2.54 | 170 | 2.36 | 130 |
| 7 | 3.27 | 439 | 2.55 | 173 | 2.54 | 170 | 2.33 | 124 |
| 8 | 3.54 | 569 | 2.70 | 216 | 2.72 | 223 | 2.24 | 107 |
| 9 | 3.50 | 548 | 2.44 | 147 | 2.48 | 156 | 2.24 | 107 |
| 10 | 3.14 | 382 | 2.36 | 130 | 2.53 | 168 | 2.24 | 107 |
| 11 | 2.99 | 320 | 2.13 | 90 | 2.47 | 153 | 2.35 | 128 |
| 12 | 2.84 | 264 | 1.99 | 71 | 2.28 | 114 | 2.35 | 128 |
| 13 | 2.84 | 264 | 2.17 | 96 | 2.26 | 111 | 2.32 | 122 |
| 14 | 5.84 | 2,760 | 2.26 | 111 | 2.26 | 111 | 2.32 | 122 |
| 15 | 4.82 | 1,520 | 2.06 | 80 | 2.25 | 109 | 2.25 | 109 |
| 16 | 4.06 | 888 | 1.89 | 59 | 2.17 | 96 | 2.21 | 102 |
| 17 | 5.35 | 2,120 | 2.16 | 94 | 2.14 | 92 | 2.72 | 223 |
| 18 | 4.95 | 1,655 | 2.07 | 82 | 2.05 | 79 | 2.72 | 223 |
| 19 | 4.29 | 1,062 | 2.28 | 114 | 2.05 | 79 | 2.69 | 213 |
| 20 | 3.93 | 800 | 2.94 | 301 | 2.37 | 132 | 2.72 | 223 |
| 21 | 3.83 | 737 | 2.91 | 290 | 2.24 | 107 | 2.24 | 107 |
| 22 | 3.60 | 600 | 3.02 | 332 | 2.17 | 96 | 2.16 | 94 |
| 23 | 3.35 | 476 | 2.72 | 223 | 2.18 | 97 | 2.14 | 92 |
| 24 | 3.62 | 612 | 2.64 | 198 | 3.02 | 332 | 2.14 | 92 |
| 25 | 3.40 | 500 | 2.55 | 173 | 2.98 | 316 | 2.12 | 89 |
| 26 | 3.36 | 481 | 2.44 | 147 | 2.84 | 264 | 2.12 | 89 |
| 27 | 3.13 | 377 | 2.29 | 116 | 2.56 | 176 | 2.07 | 82 |
| 28 | 3.84 | 743 | 2.28 | 114 | 2.46 | 151 | 2.07 | 82 |
| 29 | 3.84 | 743 | 2.27 | 113 | 2.38 | 134 | 1.96 | 67 |
| 30 | 2.70 | 216 | 2.25 | 109 | 2.38 | 134 | 1.94 | 65 |
| 31 | 3.33 | 466 | 2.01 | 73 | ..... | ..... | 1.94 | 65 |

MONTHLY DISCHARGE of Fish Creek near Priddis, for 1915.

(Drainage area 109 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Acre-feet |
| March (15-31) | 1,540 | 404.0 | 953 | 8.743 | 5.53 | 32,134 |
| April | 490 | 15.6 | 99 | 0.908 | 1.01 | 5,890 |
| May | 952 | 22.0 | 214 | 1.963 | 2.26 | 13,158 |
| June | 7,020 | 58.0 | 547 | 5.018 | 5.60 | 32,548 |
| July | 2,760 | 216.0 | 711 | 6.523 | 7.52 | 43,718 |
| August | 774 | 59.0 | 190 | 1.743 | 2.01 | 11,685 |
| September | 332 | 67.0 | 140 | 1.284 | 1.43 | 8,[illegible] |
| October | 223 | 65.0 | 122 | 1.119 | 1.29 | 7,461 |
| The period | ..... | | ..... | | 26.65 | 154,[illegible] |

NORTH BRANCH OF SHEEP RIVER NEAR MILLARVILLE.

*Location.*—On SW. ¼ Sec. 12, Tp. 21, Rge. 3, W. 5th Mer., at Malcolm T. Miller's ranch.

*Records available.*—May 22, 1908, to November 13, 1915.

*Gauge.*—Vertical staff. Elevation of zero maintained at 3,822.67 feet during 1908-10. Elevation of zero maintained at 3,821.40 feet during 1911-15.

*Bench-mark.*—Permanent iron bench-mark. Elevation 3,838.73, not 3,821.40 as given in the 1914 report (Dominion Western Railway datum), located 36 feet southwest of the NE corner of Sec. 2, Tp. 21, Rge. 3, W. 5th Mer., and about 300 feet west of the gauge.

*Discharge measurements.*—Made at the traffic bridge about one mile downstream on the road allowance on the east boundary of Sec. 12 or at a wading section, 200 feet downstream from the gauge.

*Winter flow.*—Observations not taken during winter months.

*Flood.*—The largest flood at this station of record took place on June 26, 1915, when the water level was 3,749.13 feet with a discharge of 5,621 second-feet.

*Diversions.*—The headgates of Malcolm T. Miller's irrigation ditch are about two miles above station. To date this ditch has not been used.

*Observer.*—Malcolm T. Miller.

DISCHARGE MEASUREMENTS of North Branch of Sheep River near Millarville, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq.-ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 29 | R. J. McGuinness | 35 | 16.5 | 1.04 | 2.24 | 17.2 |
| April 16 | do | 28 | 22.8 | 1.60 | 2.53 | 36.0 |
| May 12 | do | 77 | 58.2 | 3.31 | 3.22 | 193.0 |
| June 19 | H. B. R. Thompson | 101 | 335.0 | 2.34 | 4.35 | 786.0 |
| June 26 | do | ..... | 918.5 | 6.12 | 10.40 | 5,621.0*a* |
| Aug. 6 | do | 83 | 211.2 | 0.935 | 3.22 | 197.0 |
| Sept. 3 | do | 105 | 179.9 | 0.111 | 2.56 | 20.0 |
| Oct. 1 | do | 37 | 55.2 | 1.86 | 2.92 | 103.0 |
| Nov. 6 | F. K. Beach | 111 | 148.6 | 0.20 | 2.49 | 30.0 |

*a* Slope estimate.

DAILY GAUGE HEIGHT AND DISCHARGE of North Branch of Sheep River near Millarville, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.11 | 2.4 | 2.88 | 94 | 3.42 | 266 |
| 2 | ..... | ..... | 2.31 | 12.8 | 3.38 | 250 | 3.89 | 495 |
| 3 | ..... | ..... | 2.41 | 21.0 | 3.58 | 337 | 3.82 | 457 |
| 4 | ..... | ..... | 2.57 | 40.0 | 3.37 | 247 | 3.85 | 473 |
| 5 | ..... | ..... | 2.50 | 32.0 | 3.39 | 254 | 4.05 | 587 |
| 6 | ..... | ..... | 2.40 | 20.0 | 3.37 | 247 | 3.92 | 512 |
| 7 | ..... | ..... | 2.43 | 24.0 | 3.60 | 346 | 4.12 | 628 |
| 8 | ..... | ..... | 2.50 | 32.0 | 3.64 | 365 | 4.15 | 647 |
| 9 | ..... | ..... | 2.33 | 14.4 | 3.62 | 356 | 3.90 | 500 |
| 10 | ..... | ..... | 2.43 | 24.0 | 3.50 | 300 | 3.75 | 420 |
| 11 | ..... | ..... | 2.43 | 24.0 | 3.37 | 247 | 3.68 | 384 |
| 12 | ..... | ..... | 2.48 | 30.0 | 3.26 | 206 | 3.75 | 420 |
| 13 | ..... | ..... | 2.52 | 34.0 | 3.26 | 206 | 3.87 | 484 |
| 14 | ..... | ..... | 2.52 | 34.0 | 5.23 | 1,384 | 4.06 | 593 |
| 15 | 2.12 | 2.8 | 2.53 | 36.0 | 4.59 | 939 | 3.95 | 529 |
| 16 | 2.65 | 52.0 | 2.58 | 42.0 | 4.30 | 744 | 3.83 | 462 |
| 17 | 2.88 | 94.0 | 2.58 | 42.0 | 4.33 | 764 | 4.15 | 647 |
| 18 | 2.94 | 108.0 | 2.62 | 47.0 | 4.41 | 817 | 4.35 | 777 |
| 19 | 2.72 | 64.0 | 2.61 | 46.0 | 4.13 | 635 | 4.40 | 810 |
| 20 | 2.92 | 103.0 | 2.59 | 43.0 | 3.96 | 535 | 4.30 | 744 |
| 21 | 2.82 | 82.0 | 2.58 | 42.0 | 3.96 | 535 | 3.90 | 500 |
| 22 | 2.82 | 82.0 | 2.55 | 38.0 | 3.84 | 468 | 3.80 | 446 |
| 23 | 2.72 | 64.0 | 2.53 | 36.0 | 4.11 | 622 | 3.70 | 394 |
| 24 | 2.47 | 28.0 | 2.58 | 42.0 | 4.19 | 672 | 3.55 | 323 |
| 25 | 2.27 | 10.2 | 2.55 | 38.0 | 4.37 | 790 | 3.68 | 384 |
| 26 | 2.27 | 10.2 | 2.53 | 36.0 | 4.36 | 784 | 6.15 | 2,123 |
| 27 | 2.27 | 10.2 | 2.51 | 33.0 | 4.28 | 731 | 4.50 | 878 |
| 28 | 2.37 | 17.6 | 2.48 | 30.0 | 4.03 | 575 | 4.30 | 744 |
| 29 | 2.19 | 5.6 | 2.48 | 30.0 | 3.81 | 451 | 4.00 | 558 |
| 30 | 2.22 | 7.2 | 2.57 | 40.0 | 3.68 | 384 | 3.40 | 258 |
| 31 | 2.12 | 2.8 | ..... | ..... | 3.61 | 351 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of North Branch of Sheep River near Millarville, for 1915. —*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.60 | 346 | 4.00 | 558 | 2.58 | 42 | 2.95 | 111 | 2.67 | 55 |
| 2 | 3.00 | 124 | 3.70 | 394 | 2.57 | 40 | 2.93 | 106 | 2.60 | 44 |
| 3 | 3.00 | 124 | 3.55 | 323 | 2.57 | 40 | 3.05 | 138 | 2.57 | 40 |
| 4 | 3.00 | 124 | 3.35 | 239 | 2.55 | 38 | 2.98 | 119 | 2.63 | 49 |
| 5 | 2.95 | 111 | 3.30 | 220 | 2.50 | 32 | 2.97 | 116 | 2.54 | 37 |
| 6 | 2.95 | 111 | 3.26 | 206 | 2.50 | 32 | 2.95 | 111 | 2.49 | 31 |
| 7 | 2.62 | 47 | 3.18 | 178 | 2.95 | 111 | 2.85 | 88 | 2.40 | 20 |
| 8 | 3.10 | 152 | 3.15 | 168 | 2.92 | 103 | 2.85 | 88 | 2.40 | 20 |
| 9 | 2.80 | 78 | 3.08 | 146 | 2.82 | 82 | 2.84 | 86 | 2.42 | 22 |
| 10 | 2.70 | 60 | 3.08 | 146 | 2.82 | 82 | 2.86 | 90 | 2.35 | 16 |
| 11 | 2.50 | 32 | 2.95 | 111 | 2.75 | 69 | 2.94 | 108 | 2.32 | 13.6 |
| 12 | 2.40 | 20 | 2.94 | 108 | 2.75 | 69 | 2.96 | 114 | 2.32 | 13.6 |
| 13 | 3.15 | 168 | 2.98 | 119 | 2.75 | 69 | 2.89 | 96 | 2.35 | 16 |
| 14 | 5.25 | 1,400 | 2.98 | 119 | 2.75 | 69 | 2.89 | 96 | ..... | ..... |
| 15 | 4.70 | 1,014 | 2.83 | 84 | 2.75 | 69 | 2.86 | 90 | ..... | ..... |
| 16 | 5.70 | 1,760 | 2.80 | 78 | 2.75 | 69 | 2.83 | 84 | ..... | ..... |
| 17 | 5.00 | 1,220 | 2.75 | 69 | 2.74 | 67 | 2.80 | 78 | ..... | ..... |
| 18 | 4.50 | 878 | 2.85 | 88 | 2.74 | 67 | 2.81 | 80 | ..... | ..... |
| 19 | 4.30 | 744 | 2.82 | 82 | 2.75 | 69 | 2.81 | 80 | ..... | ..... |
| 20 | 4.30 | 744 | 3.35 | 239 | 2.75 | 69 | 2.81 | 80 | ..... | ..... |
| 21 | 4.00 | 558 | 3.18 | 178 | 2.74 | 67 | 2.80 | 78 | ..... | ..... |
| 22 | 3.50 | 300 | 3.01 | 127 | 2.73 | 65 | 2.77 | 73 | ..... | ..... |
| 23 | 3.25 | 202 | 2.93 | 106 | 2.85 | 88 | 2.77 | 73 | ..... | ..... |
| 24 | 3.20 | 184 | 2.86 | 90 | 3.29 | 216 | 2.77 | 73 | ..... | ..... |
| 25 | 3.20 | 184 | 2.81 | 80 | 3.30 | 220 | 2.73 | 65 | ..... | ..... |
| 26 | 3.20 | 184 | 2.76 | 71 | 3.25 | 202 | 2.73 | 65 | ..... | ..... |
| 27 | 4.50 | 878 | 2.71 | 62 | 3.15 | 168 | 2.73 | 65 | ..... | ..... |
| 28 | 4.50 | 878 | 2.69 | 58 | 3.05 | 138 | 2.72 | 64 | ..... | ..... |
| 29 | 4.35 | 777 | 2.61 | 46 | 3.02 | 130 | 2.71 | 62 | ..... | ..... |
| 30 | 4.00 | 558 | 2.61 | 46 | 3.02 | 130 | 2.68 | 57 | ..... | ..... |
| 31 | 3.85 | 473 | 2.58 | 42 | ..... | ..... | 2.68 | 57 | ..... | ..... |

MONTHLY DISCHARGE of North Branch of Sheep River near Millarville, for 1915.

(Drainage area 199 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (15-31) | 108 | 2.8 | 44 | 0.221 | 0.14 | 1,483 |
| April | 47 | 2.4 | 32 | 0.161 | 0.18 | 1,904 |
| May | 1,384 | 94.0 | 504 | 2.532 | 2.92 | 30,990 |
| June | 2,123 | 266.0 | 581 | 2.920 | 3.26 | 34,572 |
| July | 1,760 | 20.0 | 466 | 2.340 | 2.70 | 28,653 |
| August | 558 | 42.0 | 148 | 0.744 | 0.86 | 9,100 |
| September | 220 | 32.0 | 90 | 0.454 | 0.51 | 5,355 |
| October | 138 | 57.0 | 87 | 0.437 | 0.50 | 5,349 |
| November (1-13) | 55 | 13.6 | 29 | 0.146 | 0.07 | 748 |
| The period | ..... | ..... | ..... | ..... | 11.14 | 118,124 |

SOUTH BRANCH OF SHEEP RIVER AT BLACK DIAMOND.

*Location.*—On steel highway bridge on road allowance between Secs. 8 and 17, Tp. 20, Rge. 2, W. 5th Mer., about one-half mile from Black Diamond post office.

*Records available.*—From May 23, 1908, to October 31, 1915.

*Gauge.*—Standard chain gauge. Zero elevation maintained at 93.66 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Permanent.

*Discharge measurements.*—Made from traffic bridge or by wading.

*Winter flow.*—No observations taken during winter months.

*Flood.*—The highest recorded flow of this stream occurred June 26, 1915, when the water elevation at this stage was 99.16 feet with an estimated discharge of 5,125 second-feet.

*Observer.*—H. A. Arnold.

DISCHARGE MEASUREMENTS of South Branch of Sheep River at Black Diamond, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq.-ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 29 | R. J. McGuinness | 60.0 | 58.5 | 0.75 | 0.46 | 44.0 |
| April 16 | do | 72.0 | 74.5 | 1.14 | 0.73 | 85.0 |
| May 12 | do | 101.6 | 189.5 | 2.86 | 1.61 | 542.0 |
| June 19 | H. B. R. Thompson | 112.5 | 295.0 | 5.23 | 2.70 | 1,543.0 |
| June 26 | do | ..... | 593.9 | 8.63 | 5.50 | 5,125.0*a* |
| Aug. 4 | do | 90.0 | 156.2 | 3.48 | 1.53 | 543.0 |
| Sept. 3 | do | 84.0 | 86.7 | 2.22 | 0.74 | 193.0 |
| Oct. 1 | do | 86.0 | 109.8 | 2.47 | 0.96 | 272.0 |
| Nov. 6 | F. K. Beach | 71.5 | 65.0 | 1.67 | 0.26 | 109.0 |

*a* Slope estimate.

DAILY GAUGE HEIGHT AND DISCHARGE of South Branch of Sheep River at Black Diamond, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 0.56 | 56 | 1.66 | 560 | 2.20 | 1,032 |
| 2 | ..... | ..... | 0.72 | 84 | 1.90 | 760 | 2.40 | 1,228 |
| 3 | ..... | ..... | 0.97 | 152 | 1.65 | 552 | 2.40 | 1,228 |
| 4 | ..... | ..... | 0.85 | 116 | 1.40 | 364 | 2.35 | 1,178 |
| 5 | ..... | ..... | 0.79 | 100 | 1.39 | 358 | 2.45 | 1,278 |
| 6 | ..... | ..... | 0.73 | 87 | 1.48 | 418 | 2.40 | 1,228 |
| 7 | ..... | ..... | 0.72 | 84 | 1.70 | 592 | 2.44 | 1,268 |
| 8 | ..... | ..... | 0.70 | 80 | 1.97 | 822 | 2.48 | 1,308 |
| 9 | ..... | ..... | 0.58 | 59 | 2.22 | 1,051 | 2.37 | 1,198 |
| 10 | ..... | ..... | 0.56 | 56 | 1.96 | 813 | 2.18 | 1,014 |
| 11 | ..... | ..... | 0.56 | 56 | 1.86 | 725 | 2.16 | 995 |
| 12 | ..... | ..... | 0.57 | 57 | 1.75 | 632 | 2.13 | 968 |
| 13 | ..... | ..... | 0.73 | 87 | 1.79 | 664 | 2.42 | 1,248 |
| 14 | ..... | ..... | 0.73 | 87 | 2.10 | 940 | 2.95 | 1,810 |
| 15 | ..... | ..... | 0.68 | 76 | 2.20 | 1,032 | 2.41 | 1,238 |
| 16 | ..... | ..... | 0.81 | 105 | 2.25 | 1,080 | 2.39 | 1,218 |
| 17 | ..... | ..... | 0.84 | 113 | 2.25 | 1,080 | 2.55 | 1,379 |
| 18 | ..... | ..... | 0.83 | 110 | 2.20 | 1,032 | 2.74 | 1,577 |
| 19 | ..... | ..... | 0.85 | 116 | 2.20 | 1,032 | 2.95 | 1,810 |
| 20 | ..... | ..... | 0.88 | 124 | 2.15 | 986 | 2.90 | 1,750 |
| 21 | 0.77 | 95 | 0.77 | 95 | 2.10 | 940 | 2.85 | 1,695 |
| 22 | 0.79 | 100 | 0.69 | 78 | 2.25 | 1,080 | 2.80 | 1,640 |
| 23 | 0.87 | 122 | 0.70 | 80 | 2.30 | 1,128 | 2.64 | 1,472 |
| 24 | 0.79 | 100 | 0.71 | 82 | 2.30 | 1,128 | 2.39 | 1,218 |
| 25 | 0.62 | 66 | 0.68 | 76 | 2.55 | 1,379 | 2.44 | 1,268 |
| 26 | 0.56 | 56 | 0.72 | 84 | 2.70 | 1,534 | 5.19 | 4,686 |
| 27 | 0.56 | 56 | 0.79 | 100 | 2.65 | 1,482 | 3.73 | 2,759 |
| 28 | 0.56 | 56 | 0.83 | 110 | 2.60 | 1,430 | 3.23 | 2,146 |
| 29 | 0.56 | 56 | 0.93 | 140 | 2.57 | 1,399 | 2.69 | 1,524 |
| 30 | 0.57 | 57 | 1.32 | 316 | 2.50 | 1,328 | 2.51 | 1,346 |
| 31 | 0.57 | 57 | ..... | ..... | 2.35 | 1,178 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of South Branch of Sheep River at Black Diamond, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.46 | 1,298 | 1.92 | 816 | 0.74 | 194 | 0.90 | 240 |
| 2 | 2.28 | 1,126 | 1.86 | 770 | 0.86 | 227 | 0.95 | 258 |
| 3 | 2.22 | 1,070 | 1.74 | 681 | 0.73 | 191 | 0.97 | 265 |
| 4 | 2.45 | 1,288 | 1.60 | 584 | 0.65 | 172 | 0.92 | 247 |
| 5 | 2.21 | 1,061 | 1.53 | 541 | 0.65 | 172 | 0.89 | 237 |
| 6 | 2.12 | 980 | 1.41 | 468 | 0.64 | 170 | 0.83 | 218 |
| 7 | 2.23 | 1,080 | 1.35 | 435 | 0.90 | 240 | 0.76 | 198 |
| 8 | 2.21 | 1,061 | 1.33 | 424 | 0.76 | 198 | 0.74 | 194 |
| 9 | 2.00 | 878 | 1.27 | 394 | 0.83 | 218 | 0.75 | 196 |
| 10 | 1.70 | 652 | 1.20 | 360 | 0.80 | 208 | 0.76 | 198 |
| 11 | 1.66 | 625 | 1.14 | 334 | 0.75 | 196 | 0.71 | 186 |
| 12 | 1.60 | 584 | 1.11 | 320 | 0.75 | 196 | 0.70 | 184 |
| 13 | 1.59 | 578 | 1.30 | 408 | 0.69 | 182 | 0.70*d* | 184 |
| 14 | 2.85 | 1,695 | 1.15 | 338 | 0.70 | 184 | 0.71 | 186 |
| 15 | 2.28 | 1,126 | 1.31 | 413 | 0.73 | 191 | 0.64 | 170 |
| 16 | 2.88 | 1,728 | 1.16 | 342 | 0.75 | 196 | 0.64 | 170 |
| 17 | 2.44 | 1,278 | 1.18*d* | 351 | 0.74 | 194 | 0.64 | 170 |
| 18 | 2.59 | 1,424 | 1.20 | 360 | 0.80 | 208 | 0.66 | 174 |
| 19 | 2.42 | 1,259 | 1.16 | 342 | 0.88 | 234 | 0.70 | 184 |
| 20 | 2.25 | 1,098 | 1.40 | 462 | 0.86 | 227 | 0.65 | 172 |
| 21 | 2.15 | 1,007 | 1.26 | 389 | 0.82 | 214 | 0.66 | 174 |
| 22 | 2.02 | 895 | 1.20 | 360 | 0.85 | 224 | 0.62 | 165 |
| 23 | 1.93 | 823 | 1.11 | 320 | 0.97 | 265 | 0.61 | 162 |
| 24 | 1.80 | 724 | 1.01 | 280 | 1.20 | 360 | 0.61 | 162 |
| 25 | 1.77 | 702 | 1.01 | 280 | 1.14 | 334 | 0.61 | 162 |
| 26 | 1.82 | 739 | 0.96 | 262 | 1.12 | 325 | 0.62 | 165 |
| 27 | 1.71 | 659 | 0.90 | 240 | 1.05 | 296 | 0.61 | 162 |
| 28 | 2.41 | 1,250 | 0.85 | 224 | 1.05 | 296 | 0.55 | 150 |
| 29 | 2.21 | 1,061 | 0.81 | 211 | 1.00 | 276 | 0.58 | 156 |
| 30 | 2.05 | 920 | 0.75 | 196 | 0.95 | 258 | 0.60 | 160 |
| 31 | 1.96 | 847 | 0.74 | 194 | ..... | ..... | 0.54 | 148 |

*d* Gauge height interpolated.

MONTHLY DISCHARGE of South Branch of Sheep River at Black Diamond, for 1915.

(Drainage area 248 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area | Total in Acre-feet. |
| March (21–31) | 122 | 56 | 75 | 0.302 | 0.12 | 1,636 |
| April | 316 | 56 | 99 | 0.399 | 0.45 | 5,890 |
| May | 1,534 | 358 | 952 | 3.840 | 4.43 | 58,536 |
| June | 4,680 | 968 | 1,524 | 6.140 | 6.85 | 90,684 |
| July | 1,728 | 578 | 1,017 | 4.100 | 4.73 | 62,533 |
| August | 816 | 194 | 390 | 1.570 | 1.81 | 23,980 |
| September | 360 | 170 | 228 | 0.919 | 1.03 | 13,567 |
| October | 265 | 148 | 187 | 0.754 | 0.87 | 11,498 |
| The period | | | | | 20.29 | 268,324 |

SHEEP RIVER NEAR OKOTOKS.

*Location.*—On the NW. ¼ Sec. 22, Tp. 20, Rge. 29, W. 4th Mer., at the Canadian Pacific Railway Company's bridge about one mile southeast of Okotoks.

*Records available.*—From May 7, 1909, to October 31, 1915.

*Gauge.*—Chain. Previous to 1915 a vertical staff. The elevation of the zero has been maintained at 3,417.12 feet during 1912–15. High water staff gauge is imbedded in the cement on centre pier. Elevation of the zero maintained at 3,419.12 feet during 1912–15.

*Bench-mark.*—Top of the left abutment at southwest corner. Elevation, 3,431.57 feet above mean sea level. (C.P.R. datum.)

*Channel.*—Shifting.

*Discharge measurements.*—From bridge or by wading.

*Winter flow.*—Observations discontinued during winter months.

*Artificial control.*—Gas pipes crossing river below gauging section form good control.

*Floods.*—The highest recorded discharge in recent years of this stream occurred June 26, 1915, when the water level at this station was 3,427.92, with an estimated discharge of 21,394 sec.-ft. Considerable damage was done to property in the town of Okotoks and the gas main at the station was carried away. Floods also occurred on this stream in 1899 and 1902, and a flood with an estimated discharge of 22,230 sec.-ft. occurred some time previous to 1894 according to old records in this office.

*Observer.*—Miss M. B. Henderson.

DISCHARGE MEASUREMENTS of Sheep River near Okotoks, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 27 | R. J. McGuinness | 93.0 | 258.0 | 0.34 | 2.17 | 88 |
| April 15 | do | 98.0 | 268.0 | 0.46 | 2.35 | 124 |
| May 11 | do | 118.0 | 409.2 | 2.57 | 3.65 | 1,042 |
| June 18 | H. B. R. Thompson | 164.0 | 432.0 | 4.83 | 4.78 | 2,068 |
| June 26 | do | ..... | 2321.5 | 9.21 | 10.80 | 21,394*a* |
| June 27 | do | 283.0 | 789.0 | 6.24 | 5.50 | 4,922 |
| Aug. 2 | do | 179.5 | 448.3 | 4.10 | 4.45 | 1,837 |
| Sept. 2 | do | 123.0 | 212.5 | 1.61 | 3.23 | 343 |
| Sept. 30 | do | 119.5 | 269.4 | 2.06 | 3.48 | 556 |
| Nov. 5 | F. K. Beach | 126.0 | 209.2 | 1.17 | 3.05 | 245 |

*a* Slope estimate.

DAILY GAUGE HEIGHT AND DISCHARGE of Sheep River near Okotoks, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.15 | 92 | 2.83 | 301 | 3.90 | 1,150 |
| 2 | ..... | ..... | 2.18*d* | 97 | 3.30 | 605 | 4.25 | 1,565 |
| 3 | ..... | ..... | 2.20 | 100 | 3.28*d* | 590 | 4.25 | 1,565 |
| 4 | ..... | ..... | 2.40 | 135 | 3.25 | 568 | 4.28*d* | 1,604 |
| 5 | ..... | ..... | 2.38*d* | 131 | 3.30 | 605 | 4.30 | 1,630 |
| 6 | ..... | ..... | 2.37 | 129 | 3.48*d* | 753 | 4.36*d* | 1,714 |
| 7 | ..... | ..... | 2.35 | 125 | 3.65 | 905 | 4.42 | 1,800 |
| 8 | ..... | ..... | 2.35 | 125 | 4.00 | 1,260 | 4.32 | 1,658 |
| 9 | ..... | ..... | 2.35 | 125 | 4.15 | 1,440 | 4.32 | 1,658 |
| 10 | ..... | ..... | 2.32*d* | 119 | 3.90*d* | 1,150 | 4.02 | 1,284 |
| 11 | ..... | ..... | 2.30 | 115 | 3.65 | 905 | 4.08*d* | 1,356 |
| 12 | ..... | ..... | 2.30 | 115 | 3.46 | 736 | 4.13*d* | 1,416 |
| 13 | ..... | ..... | 2.30 | 115 | 3.49 | 761 | 4.19 | 1,488 |
| 14 | ..... | ..... | 2.30 | 115 | 5.11 | 2,979 | 4.29 | 1,617 |
| 15 | ..... | ..... | 2.35 | 125 | 4.61 | 2,086 | 4.34 | 1,686 |
| 16 | ..... | ..... | 2.37 | 129 | 4.47 | 1,875 | 4.35 | 1,700 |
| 17 | 3.31 | 100*c* | 2.40 | 135 | 4.37 | 1,728 | 4.50 | 1,920 |
| 18 | 3.34 | 125 | 2.40 | 135 | 4.27*d* | 1,591 | 4.75 | 2,315 |
| 19 | 3.19 | 150 | 2.40*d* | 135 | 4.17*d* | 1,464 | 5.00 | 2,770 |
| 20 | 3.24 | 175 | 2.40 | 135 | 4.10*d* | 1,380 | 4.70 | 2,230 |
| 21 | 3.34 | 200*c* | 2.45 | 150 | 4.03 | 1,296 | 4.40 | 1,770 |
| 22 | 2.84 | 307*a* | 2.40*d* | 135 | 4.13 | 1,416 | 4.35 | 1,700 |
| 23 | 2.69 | 236 | 2.35 | 125 | 4.23 | 1,539 | 4.35 | 1,700 |
| 24 | 2.59 | 196 | 2.35 | 125 | 4.38 | 1,742 | 4.30 | 1,630 |
| 25 | 2.56 | 186 | 2.35 | 125 | 4.63 | 2,118 | 4.32 | 1,658 |
| 26 | 2.45*d* | 150 | 2.35*d* | 125 | 4.44 | 1,830 | 10.80 | 21,390*d* |
| 27 | 2.34 | 123 | 2.35 | 125 | 4.42*d* | 1,800 | 7.80 | 10,950*b* |
| 28 | 2.24 | 106 | 2.35*d* | 125 | 4.39 | 1,756 | 6.50 | 6,850 |
| 29 | 2.24 | 106 | 2.35 | 125 | 4.22*d* | 1,526 | 5.20 | 3,330 |
| 30 | 2.14 | 91 | 2.35 | 125 | 4.04 | 1,308 | 3.94 | 1,032 |
| 31 | 2.09 | 84 | ..... | ..... | 3.97*d* | 1,227 | ..... | ..... |

*a–a* Curve No. 1.
*b–b* Curve No. 2.
*c–c* Ice conditions, discharges estimated.
*d* Interpolated gauge height.

DAILY GAUGE HEIGHT AND DISCHARGE of Sheep River near Okotoks, for 1915.—*Concluded.*

| DAY. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 4.04 | 1,166 | 4.70 | 2,300 | 3.23 | 356 | 3.45 | 520 |
| 2 | 3.79 | 849 | 4.50 | 1,920 | 3.23 | 356 | 3.45 | 520 |
| 3 | 3.79 | 849 | 4.20 | 1,400 | 3.23 | 356 | 3.50 | 560 |
| 4 | 3.79 | 849 | 4.10 | 1,250 | 3.18 | 322 | 3.47 | 536 |
| 5 | 3.79 | 849 | 4.00 | 1,110 | 3.18 | 322 | 3.45 | 520 |
| 6 | 3.64 | 690 | 3.90 | 980 | 3.17 | 315 | 3.35 | 442 |
| 7 | 3.87 | 944 | 3.90 | 980 | 3.55 | 605 | 3.30 | 405 |
| 8 | 3.99 | 1,097 | 3.85 | 920 | 3.40 | 480 | 3.30 | 405 |
| 9 | 3.89 | 968 | 3.70 | 750 | 3.40 | 480 | 3.30 | 405 |
| 10 | 3.79 | 849 | 3.65 | 700 | 3.35 | 442 | 3.30 | 405 |
| 11 | 3.44 | 512 | 3.55 | 605 | 3.30 | 405 | 3.30 | 405 |
| 12 | 3.14 | 296 | 3.50 | 560 | 3.30 | 405 | 3.30 | 405 |
| 13 | 3.24 | 363 | 3.65 | 700 | 3.25 | 370 | 3.30 | 405 |
| 14 | 8.00 | 11,600 | 3.64 | 690 | 3.25 | 370 | 3.30 | 405 |
| 15 | 8.00 | 11,600 | 3.59 | 641 | 3.25 | 370 | 3.25 | 370 |
| 16 | 10.00 | 18,500 | 3.59 | 641 | 3.25 | 370 | 3.25 | 370 |
| 17 | 8.50 | 13,350 | 3.54 | 596 | 3.25 | 370 | 3.25 | 370 |
| 18 | 8.00 | 11,600 | 3.64 | 690 | 3.25 | 370 | 3.25 | 370 |
| 19 | 7.70 | 10,600 | 3.64 | 690 | 3.25 | 370 | 3.23 | 356 |
| 20 | 7.30 | 9,350 | 4.42 | 1,776 | 3.27 | 384 | 3.23 | 356 |
| 21 | 4.54 | 1,992 | 4.09 | 1,236 | 3.30 | 405 | 3.20 | 335 |
| 22 | 4.90 | 2,700 | 3.64 | 690 | 3.45 | 520 | 3.20 | 335 |
| 23 | 4.45 | 1,830 | 3.59 | 641 | 3.50 | 560 | 3.18 | 322 |
| 24 | 4.50 | 1,920 | 3.54 | 596 | 3.80 | 860 | 3.15 | 303 |
| 25 | 4.40 | 1,940 | 3.44 | 512 | 3.85 | 920 | 3.15 | 303 |
| 26 | 4.45 | 1,830 | 3.43 | 504 | 3.65 | 700 | 3.15 | 303 |
| 27 | 4.35 | 1,650 | 3.43 | 504 | 3.60 | 650 | 3.15 | 303 |
| 28 | 5.60 | 4,250 | 3.38 | 465 | 3.45 | 520 | 3.15 | 303 |
| 29 | 5.00 | 2,900 | 3.33 | 428 | 3.45 | 520 | 3.10 | 270 |
| 30 | 4.70 | 2,300 | 3.28 | 391 | 3.45 | 520 | 3.10 | 270 |
| 31 | 4.45 | 1,830 | 3.28 | 391 | ..... | ..... | 3.10 | 270*b* |

*b–b* Curve No. 2.

MONTHLY DISCHARGE of Sheep River near Okotoks, for 1915.

(Drainage area 632 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (17–31) | 307 | 84 | 156 | 0.247 | 0.14 | 4,642 |
| April | 150 | 92 | 124 | 0.196 | 0.22 | 7,379 |
| May | 2,979 | 301 | 1,330 | 2.104 | 2.43 | 81,780 |
| June | 21,390 | 1,032 | 2,871 | 4.543 | 5.07 | 170,840 |
| July | 18,500 | 296 | 3,920 | 6.203 | 7.15 | 241,130 |
| August | 2,300 | 391 | 847 | 1.340 | 1.54 | 52,080 |
| September | 920 | 315 | 466 | 0.737 | 0.82 | 27,720 |
| October | 560 | 270 | 382 | 0.604 | 0.70 | 23,488 |
| The period | ..... | ..... | ..... | .. | 18.07 | 608,968 |

HIGHWOOD RIVER AT BROWN'S RANCH.

*Location.*—On SE. ¼ Sec. 20, Tp. 18, Rge. 2, W. 5th Mer., at B. F. Brown's ranch, about eight miles north of Pekisko and five miles west of Longview Post Office.

*Records available.*—July 27, 1912, to October 31, 1915.

*Gauge.*—Vertical staff. Elevation of zero maintained at 93.90 feet during 1912. Elevation of zero maintained at 91.97 feet during 1913–15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Shifts during floods.

*Discharge measurements.*—Made from the traffic bridge one and one-half miles downstream or by wading near bridge.

*Winter flow.*—Observations discontinued during winter months.

*Flood.*—The highest flood of which records are available took place June 26, 1915, when the water level was 97.97 feet with a discharge of 7,516 sec.-ft.

*Observer.*—B. F. Brown

DISCHARGE MEASUREMENTS of Highwood River at Brown's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq.-ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 22 | R. J. McGuinness | 118.0 | 149.2 | 2.86 | 1.13 | 426 |
| May 21 | do | 192.0 | 394.4 | 3.58 | 2.12 | 1,414 |
| June 25 | H. B. R. Thompson | 190.0 | 448.0 | 5.31 | 2.65 | 2,416 |
| June 26 | do | ..... | 946.0 | 7.94 | 6.00 | 7,516*a* |
| July 3 | do | 188.5 | 437.0 | 5.71 | 2.78 | 2,494 |
| Aug. 11 | do | 148.0 | 205.9 | 3.00 | 1.42 | 617 |
| Sept. 13 | do | 120.5 | 142.6 | 2.23 | 1.05 | 318 |
| Oct. 9 | do | 120.5 | 144.5 | 2.27 | 1.06 | 328 |
| Nov. 12 | F. K. Beach | 69.0 | 67.6 | 2.46 | 0.59 | 166 |

*a* Slope estimate.

DAILY GAUGE HEIGHT AND DISCHARGE of Highwood River at Brown's Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.31 | 509 | 1.73 | 936 | 2.40 | 1,890 |
| 2 | ..... | ..... | 1.38 | 572 | 2.04 | 1,356 | 2.45 | 1,965 |
| 3 | ..... | ..... | 1.33 | 527 | 1.99 | 1,286 | 2.50 | 2,040 |
| 4 | ..... | ..... | 1.48 | 670 | 1.94 | 1,216 | 2.45 | 1,965 |
| 5 | ..... | ..... | 1.68 | 878 | 1.79 | 1,008 | 2.50 | 2,040 |
| 6 | ..... | ..... | 1.83 | 1,062 | 1.89 | 1,146 | 2.55 | 2,115 |
| 7 | ..... | ..... | 2.13 | 1,485 | 1.99 | 1,286 | 2.55 | 2,115 |
| 8 | ..... | ..... | 2.04 | 1,356 | 2.39 | 1,875 | 2.65 | 2,265 |
| 9 | ..... | ..... | 2.00 | 1,300 | 2.69 | 2,325 | 2.50 | 2,040 |
| 10 | ..... | ..... | 1.13 | 381 | 2.49 | 2,025 | 2.45 | 1,965 |
| 11 | ..... | ..... | 0.83 | 232 | 2.39 | 1,875 | 2.60 | 2,190 |
| 12 | ..... | ..... | 0.81 | 227 | 2.19 | 1,575 | 2.75 | 2,415 |
| 13 | ..... | ..... | 0.88 | 245 | 2.14 | 1,500 | 2.80 | 2,490 |
| 14 | 1.68 | 878 | 0.85 | 237 | 2.99 | 2,775 | 2.90 | 2,640 |
| 15 | 1.68 | 878 | 0.88 | 245 | 2.49 | 2,025 | 3.00 | 2,790 |
| 16 | 1.73 | 936 | 0.97 | 285 | 2.29 | 1,725 | 3.10 | 2,940 |
| 17 | 1.63 | 823 | 1.08 | 348 | 2.34 | 1,800 | 3.15 | 3,015 |
| 18 | 1.71 | 912 | 1.18 | 416 | 2.29 | 1,725 | 3.20 | 3,090 |
| 19 | 1.73 | 936 | 1.28 | 486 | 2.24 | 1,650 | 3.25 | 3,165 |
| 20 | 1.76 | 972 | 1.29 | 493 | 2.19 | 1,575 | 3.00 | 2,790 |
| 21 | 1.78 | 996 | 1.18 | 416 | 2.12 | 1,470 | 2.90 | 2,640 |
| 22 | 1.83 | 1,062 | 1.13 | 381 | 2.08 | 1,412 | 2.80 | 2,490 |
| 23 | 1.88 | 1,132 | 1.08 | 348 | 2.15 | 1,515 | 2.75 | 2,415 |
| 24 | 1.43 | 620 | 0.98 | 290 | 2.35 | 1,815 | 2.65 | 2,265 |
| 25 | 1.33 | 527 | 0.98 | 290 | 2.50 | 2,040 | 2.70 | 2,340 |
| 26 | 1.28 | 486 | 0.98 | 290 | 2.65 | 2,265 | 6.00 | 7,540 |
| 27 | 1.31 | 509 | 0.98 | 290 | 2.65 | 2,265 | 4.10 | 4,500 |
| 28 | 1.28 | 486 | 0.96 | 280 | 2.60 | 2,190 | 3.50 | 3,540 |
| 29 | 1.18 | 416 | 1.33 | 527 | 2.70 | 2,340 | 3.20 | 3,090 |
| 30 | 1.23 | 451 | 1.68 | 878 | 2.65 | 2,265 | 3.00 | 2,790 |
| 31 | 1.28 | 486 | ..... | ..... | 2.45 | 1,965 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Highwood River at Brown's Ranch for 1915.
—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.30 | 3,240 | 1.98 | 1,272 | 1.04 | 324 | 1.20 | 430 |
| 2 | 3.20 | 3,090 | 1.95 | 1,230 | 1.03 | 318 | 1.15 | 395 |
| 3 | 2.80 | 2,490 | 1.93 | 1,202 | 1.03 | 318 | 1.10 | 360 |
| 4 | 2.65 | 2,265 | 1.90 | 1,160 | 1.01 | 306 | 1.12 | 374 |
| 5 | 2.65 | 2,265 | 1.75 | 960 | 1.01 | 306 | 1.10 | 360 |
| 6 | 2.63 | 2,235 | 1.70 | 900 | 1.01 | 306 | 1.08 | 348 |
| 7 | 2.70 | 2,340 | 1.60 | 790 | 1.11 | 367 | 1.05 | 330 |
| 8 | 2.60 | 2,190 | 1.55 | 740 | 1.06 | 336 | 1.03 | 318 |
| 9 | 2.50 | 2,040 | 1.50 | 690 | 1.11 | 367 | 1.02 | 312 |
| 10 | 2.30 | 1,740 | 1.45 | 640 | 1.06 | 336 | 1.00 | 300 |
| 11 | 2.10 | 1,440 | 1.42 | 610 | 1.03 | 318 | 1.08 | 348 |
| 12 | 2.05 | 1,370 | 1.40 | 590 | 1.01 | 306 | 1.04 | 324 |
| 13 | 1.90 | 1,160 | 1.45 | 640 | 1.06 | 336 | 1.00 | 300 |
| 14 | 2.35 | 1,815 | 1.35 | 545 | 1.03 | 318 | 0.96 | 280 |
| 15 | 2.15 | 1,515 | 1.35 | 545 | 1.00 | 300 | 0.95 | 275 |
| 16 | 2.05 | 1,370 | 1.40 | 590 | 1.00 | 300 | 0.97 | 285 |
| 17 | 2.03 | 1,342 | 1.35 | 545 | 1.00 | 300 | 1.00 | 300 |
| 18 | 2.20 | 1,590 | 1.40 | 590 | 0.98 | 290 | 1.05 | 330 |
| 19 | 2.03 | 1,342 | 1.45 | 640 | 0.96 | 280 | 1.00 | 300 |
| 20 | 1.95 | 1,230 | 1.40 | 590 | 0.97 | 285 | 0.98 | 290 |
| 21 | 1.90 | 1,160 | 1.38 | 572 | 1.00 | 300 | 0.95 | 275 |
| 22 | 1.85 | 1,090 | 1.28 | 486 | 1.08 | 348 | 1.00 | 300 |
| 23 | 1.83 | 1,062 | 1.25 | 465 | 1.25 | 465 | 0.98 | 290 |
| 24 | 1.80 | 1,020 | 1.20 | 430 | 1.28 | 486 | 0.95 | 275 |
| 25 | 2.25 | 1,665 | 1.15 | 395 | 1.25 | 465 | 0.95 | 275 |
| 26 | 2.10 | 1,440 | 1.12 | 374 | 1.20 | 430 | 0.93 | 265 |
| 27 | 1.90 | 1,160 | 1.10 | 360 | 1.20 | 430 | 0.90 | 250 |
| 28 | 2.40 | 1,890 | 1.08 | 348 | 1.22 | 444 | 0.90 | 250 |
| 29 | 2.25 | 1,665 | 1.05 | 330 | 1.18 | 416 | 0.88 | 245 |
| 30 | 2.10 | 1,440 | 1.05 | 330 | 1.15 | 395 | 0.90 | 250 |
| 31 | 2.00 | 1,300 | 1.03 | 318 | ..... | ..... | 0.95 | 275 |

MONTHLY DISCHARGE of Highwood River at Brown's Ranch, for 1915.

(Drainage area 421 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (14-31) | 1,132 | 416 | 750 | 1.781 | 1.19 | 26,777 |
| April | 1,485 | 227 | 531 | 1.261 | 1.41 | 31,597 |
| May | 2,775 | 936 | 1,749 | 4.154 | 4.78 | 107,542 |
| June | 7,540 | 1,890 | 2,718 | 6.456 | 7.21 | 161,732 |
| July | 3,240 | 1,020 | 1,708 | 4.057 | 4.68 | 105,021 |
| August | 1,272 | 318 | 641 | 1.523 | 1.75 | 39,414 |
| September | 486 | 280 | 350 | 0.831 | 0.93 | 20,826 |
| October | 430 | 245 | 307 | 0.729 | 0.84 | 18,877 |
| The period | ..... | ..... | ..... | ..... | 22.79 | 511,786 |

PEKISKO CREEK AT PEKISKO

*Location.*—On the NW. ¼ Sec. 8, Tp. 17, Rge. 2, W. 5th Mer., at George Lane's Bar U ranch, and about twenty-five miles southwest of High River.

*Records available.*—October 6, 1911, to October 31, 1915.

*Gauge.*—Vertical staff. Elevation of zero of gauge is 93.90 feet, which has been unchanged since establishment.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.
*Channel.*—Fairly permanent.
*Discharge measurements.*—Made from a small suspension foot-bridge or by wading.
*Winter flow.*—Observations not taken during winter months.
*Diversions.*—The headgates of George Lane's irrigation ditch are about one and one-half miles upstream from station.
*Observer.*—F. R. Pike.

DISCHARGE MEASUREMENTS of Pekisko Creek at Pekisko, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq.-ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 1 | R. J. McGuinness | 39.0 | 24.3 | 0.57 | 1.15 | 14.0 |
| April 21 | do | 41.0 | 30.8 | 1.21 | 1.39 | 37.6 |
| May 20 | do | 54.0 | 128.9 | 1.76 | 2.28 | 227.0 |
| June 24 | H. B. R. Thompson | 43.0 | 140.0 | 1.76 | 2.25 | 246.0 |
| June 26 | do | ..... | 254.0 | 2.74 | 4.00 | 696.0*a* |
| Aug. 9 | do | 58.5 | 51.6 | 1.44 | 1.53 | 75.0 |
| Sept. 11 | do | 54.5 | 44.5 | 1.01 | 1.33 | 45.0 |
| Oct. 9 | do | 54.5 | 47.5 | 1.01 | 1.34 | 48.0 |

*a* Slope estimate.

DAILY GAUGE HEIGHT AND DISCHARGE of Pekisko Creek at Pekisko, for 1915.

| Day. | April. | | May. | | June. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.16 | 15 | 1.96 | 141 | 2.04 | 160 |
| 2 | 1.24 | 20 | 2.34 | 238 | 2.24 | 212 |
| 3 | 1.29 | 27 | 2.23 | 210 | 2.15 | 189 |
| 4 | 1.31 | 29 | 2.15 | 189 | 2.11 | 179 |
| 5 | 1.30 | 28 | 2.21 | 205 | 2.25 | 215 |
| 6 | 1.29 | 27 | 2.12 | 181 | 2.18 | 197 |
| 7 | 1.28 | 26 | 2.20 | 202 | 2.28 | 223 |
| 8 | 1.27 | 25 | 2.28 | 223 | 2.24 | 212 |
| 9 | 1.26 | 24 | 2.26 | 218 | 2.14 | 186 |
| 10 | 1.25 | 23 | 2.17 | 194 | 2.11 | 179 |
| 11 | 1.25 | 23 | 2.05 | 163 | 2.12 | 181 |
| 12 | 1.25 | 23 | 1.95 | 139 | 2.15 | 189 |
| 13 | 1.30*d* | 28 | 2.02 | 155 | 2.15 | 189 |
| 14 | 1.35 | 33 | 2.76 | 353 | 2.26 | 218 |
| 15 | 1.35 | 33 | 2.59 | 306 | 2.40 | 254 |
| 16 | 1.36 | 35 | 2.41 | 257 | 2.42 | 259 |
| 17 | 1.37 | 36 | 2.36 | 244 | 2.44 | 265 |
| 18 | 1.40 | 39 | 2.31 | 231 | 2.64 | 320 |
| 19 | 1.40 | 39 | 2.31 | 231 | 2.96 | 409 |
| 20 | 1.40*d* | 39 | 2.28 | 223 | 2.74 | 348 |
| 21 | 1.39 | 38 | 2.38 | 249 | 2.56 | 298 |
| 22 | 1.39*d* | 38 | 2.35 | 241 | 2.45 | 268 |
| 23 | 1.39 | 38 | 2.49 | 279 | 2.36 | 244 |
| 24 | 1.37 | 36 | 2.65 | 323 | 2.28 | 223 |
| 25 | 1.35 | 33 | 2.64 | 320 | 2.38 | 249 |
| 26 | 1.35 | 33 | 2.58 | 304 | 3.84 | 652 |
| 27 | 1.35 | 33 | 2.45 | 268 | 3.20 | 483 |
| 28 | 1.35 | 33 | 2.39 | 251 | 2.85 | 390 |
| 29 | 1.35 | 33 | 2.32 | 233 | 2.59 | 320 |
| 30 | 1.40 | 39 | 2.20 | 202 | 2.36 | 260 |
| 31 | ..... | ..... | 2.14 | 186 | ..... | ..... |

*d* Gauge height interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of Pekisko Creek at Pekisko, for 1915.—*Concluded.*

| DAY. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.46 | 286 | 1.85 | 137 | ..... | ..... | 1.34 | 48 |
| 2 | 2.26 | 235 | 1.82 | 130 | ..... | ..... | 1.35 | 49 |
| 3 | 2.26 | 235 | 1.95 | 159 | ..... | ..... | 1.41 | 57 |
| 4 | 2.12 | 200 | 1.79 | 124 | ..... | ..... | 1.36 | 50 |
| 5 | 2.05 | 182 | 1.72 | 110 | ..... | ..... | 1.34 | 48 |
| 6 | 2.01 | 172 | 1.65 | 97 | ..... | ..... | 1.39 | 55 |
| 7 | 2.05 | 182 | 1.64 | 95 | ..... | ..... | 1.39 | 55 |
| 8 | 1.96 | 161 | 1.64 | 95 | ..... | ..... | 1.37 | 52 |
| 9 | 1.86 | 139 | 1.53 | 75 | ....*b*.... | ..... | 1.34 | 48 |
| 10 | 1.90 | 148 | 1.54 | 77 | 1.34 | 48 | 1.38 | 53 |
| 11 | 1.77 | 120 | ....*a*.... | ..... | 1.33 | 46 | 1.36 | 50 |
| 12 | 1.72 | 110 | ..... | ..... | 1.32 | 45 | 1.38 | 53 |
| 13 | 1.71 | 108 | ..... | ..... | 1.30 | 42 | 1.38 | 53 |
| 14 | 2.06 | 185 | ..... | ..... | 1.28 | 40 | 1.39 | 55 |
| 15 | 1.84 | 135 | ..... | ..... | 1.26 | 37 | 1.39 | 55 |
| 16 | 1.82 | 130 | ..... | ..... | 1.24 | 35 | 1.39 | 55 |
| 17 | 1.94 | 157 | ..... | ..... | 1.23 | 34 | 1.39 | 55 |
| 18 | 2.02 | 175 | ..... | ..... | 1.23 | 34 | 1.39 | 55 |
| 19 | 1.84 | 135 | ..... | ..... | 1.27 | 38 | 1.41 | 57 |
| 20 | 1.84 | 135 | ..... | ..... | 1.24 | 35 | 1.41 | 57 |
| 21 | 1.72 | 110 | ..... | ..... | 1.23 | 34 | 1.38 | 53 |
| 22 | 1.71 | 108 | ..... | ..... | 1.21 | 31 | 1.38 | 53 |
| 23 | 1.65 | 97 | ..... | ..... | 1.31 | 43 | 1.37 | 52 |
| 24 | 1.65 | 97 | ..... | ..... | 1.53 | 75 | 1.37 | 52 |
| 25 | 1.65 | 97 | ..... | ..... | 1.47 | 66 | 1.36 | 50 |
| 26 | 1.79 | 124 | ..... | ..... | 1.39 | 55 | 1.36 | 50 |
| 27 | 1.70 | 106 | ..... | ..... | 1.42 | 59 | 1.36 | 50 |
| 28 | 2.18 | 215 | ..... | ..... | 1.39 | 55 | 1.33 | 46 |
| 29 | 2.12 | 200 | ..... | ..... | 1.39 | 55 | 1.33 | 46 |
| 30 | 2.07 | 187 | ..... | ..... | 1.35 | 49 | 1.35 | 49 |
| 31 | 1.95 | 159 | ..... | ..... | ..... | ..... | 1.35 | 49 |

*a* to *b* No gauge height observations available.

MONTHLY DISCHARGE of Pekisko Creek at Pekisko, for 1915.

(Drainage area 99 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| April | 39 | 15 | 31 | 0.313 | 0.35 | 1,845 |
| May | 353 | 139 | 231 | 2.333 | 2.69 | 14,204 |
| June | 652 | 160 | 266 | 2.687 | 3.00 | 15,828 |
| July | 286 | 97 | 156 | 1.576 | 1.82 | 9,592 |
| August (1-10) | 159 | 75 | 110 | 1.111 | 0.41 | 2,182 |
| September (10-30) | 75 | 31 | 46 | 0.465 | 0.36 | 1,916 |
| October | 57 | 46 | 52 | 0.525 | 0.61 | 3,198 |
| The period | ..... | ..... | ..... | ..... | 9.24 | 48,765 |

STIMSON CREEK NEAR PEKISKO.

*Location.*—On the NW. ¼ Sec. 2, Tp. 17, Rge. 2, W. 5th Mer., at E. R. Baker's ranch, about three miles east of Pekisko post office.

*Records available.*—From October 6, 1911, to October 9, 1915.

*Gauge.*—Vertical staff. Zero elevation maintained at 90.20 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Fairly permanent.

*Discharge measurements.*—By wading or from bridge.

*Winter flow.*—No observations taken during winter months.

*Flood.*—The flood of 1915 was the greatest of which records are available. On June 26, 1915, the gauge height was 6.97 feet with an estimated discharge of 1,726 second-feet.

*Remarks.*—The observations of gauge heights at this station were for broken periods only as no observer was available for part of the time.

*Observer.*—E. R. Baker.

DISCHARGE MEASUREMENTS of Stimson Creek near Pekisko, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 1 | R. J. McGuinness | 50.0 | 36.5 | 0.93 | 1.85 | 34.0 |
| April 21 | do | 19.0 | 7.6 | 1.30 | 1.42 | 9.8 |
| May 20 | do | 37.5 | 109.1 | 2.07 | 3.09 | 276.0 |
| June 24 | H. B. R. Thompson | 66.0 | 99.3 | 2.99 | 2.70 | 297.0 |
| June 26 | do | ..... | 283.0 | 6.10 | 6.97 | 17,260.0*a* |
| Aug. 9 | do | 32.6 | 41.7 | 1.01 | 1.95 | 42.0 |
| Sept. 11 | do | 35.0 | 42.0 | 0.68 | 1.83 | 29.0 |
| Oct. 9 | do | 31.0 | 37.1 | 0.71 | 1.79 | 26.0 |

*a* Slope estimate.

DAILY GAUGE HEIGHT AND DISCHARGE of Stimson Creek near Pekisko, for 1915.

| Day. | March. | | April. | | May. | | June. | | July. | | August. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.85 | 35.0 | 1.53 | 8 | ..... | ..... | ...*c*... | ..... | 2.73 | 210 |
| 2 | ..... | ..... | 1.75 | 25.0 | 2.43 | 133 | ..... | ..... | 3.35 | 418 | 2.75 | 216 |
| 3 | ..... | ..... | 1.73 | 23.0 | 2.48 | 145 | ..... | ..... | 3.30 | 400 | 2.71 | 205 |
| 4 | ..... | ..... | 1.80 | 30.0 | 2.18 | 82 | ..... | ..... | 3.20 | 365 | 2.60 | 176 |
| 5 | ..... | ..... | 1.80 | 30.0 | 2.01 | 54 | ..... | ..... | 3.05 | 312 | 2.57 | 168 |
| 6 | ..... | ..... | 1.79 | 29.0 | 2.05 | 60 | ..... | ..... | 2.90 | 260 | 2.50 | 150 |
| 7 | ..... | ..... | 1.79 | 29.0 | 1.98 | 50 | ..... | ..... | 2.80 | 230 | 2.35 | 116 |
| 8 | ..... | ..... | 1.73 | 23.0 | 1.90*a* | 40 | ..... | ..... | 3.19 | 362 | 2.29 | 104 |
| 9 | ..... | ..... | 1.75 | 25.0 | 1.83 | 33 | ..... | ..... | 3.20 | 365 | 1.95 | 46 |
| 10 | ..... | ..... | 1.75 | 25.0 | 1.87 | 37 | ..... | ..... | 3.42 | 442 | 2.01 | 54 |
| 11 | ..... | ..... | 1.73 | 23.0 | 2.11 | 70 | ..... | ..... | 3.30 | 400 | 2.00 | 52 |
| 12 | ..... | ..... | 1.67 | 17.8 | 2.08 | 65 | ..... | ..... | 3.16 | 351 | 1.97 | 48 |
| 13 | ..... | ..... | 1.69 | 19.2 | 2.81 | 233 | ..... | ..... | 2.91 | 264 | 1.95 | 46 |
| 14 | ..... | ..... | 1.69 | 19.2 | ...*b*... | ..... | ..... | ..... | 2.83 | 239 | 1.97 | 48 |
| 15 | ..... | ..... | 1.66 | 17.0 | ..... | ..... | ..... | ..... | 3.18 | 358 | 2.00 | 52 |
| 16 | ..... | ..... | 1.64 | 15.5 | ..... | ..... | ..... | ..... | 3.03 | 305 | 2.00 | 52 |
| 17 | ..... | ..... | 1.64 | 15.5 | ..... | ..... | ..... | ..... | 3.20 | 365 | 2.37 | 120 |
| 18 | 2.40 | 126.0 | 1.62 | 14.0 | ..... | ..... | ..... | ..... | 3.20 | 365 | 2.65 | 189 |
| 19 | 2.20 | 86.0 | 1.59 | 11.8 | ...*c*... | ..... | ..... | ..... | 3.11 | 333 | 2.50 | 150 |
| 20 | 2.13 | 73.0 | 1.60 | 12.5 | 3.09 | 326 | ..... | ..... | 3.10 | 330 | 2.43 | 133 |
| 21 | 2.03 | 57.0 | 1.42 | 3.2 | ...*b*... | ..... | ..... | ..... | 3.10 | 330 | 2.30 | 106 |
| 22 | 1.88 | 38.0 | 1.57 | 10.6 | ..... | ..... | ..... | ..... | 2.92 | 267 | ...*b*... | ..... |
| 23 | 1.95 | 46.0 | 1.58 | 11 2 | ..... | ..... | ..... | ..... | 2.95 | 277 | ..... | ..... |
| 24 | 1.87 | 37.0 | 1.58 | 11.2 | ..... | ..... | ..... | ..... | 2.91 | 263 | ..... | ..... |
| 25 | 1.80 | 30.0 | 1.70 | 20.0 | ..... | ..... | ..... | ..... | 2.80 | 230 | ..... | ..... |
| 26 | 1.80 | 30.0 | 1.66 | 17.0 | ..... | ..... | ..... | ..... | 2.89 | 257 | ..... | ..... |
| 27 | 1.75 | 25.0 | 1.63 | 14.8 | ..... | ..... | ..... | ..... | 2.90 | 260 | ..... | ..... |
| 28 | 1.65 | 16.2 | 1.59 | 11.8 | ..... | ..... | ..... | ..... | 2.85 | 245 | ..... | ..... |
| 29 | 1.65 | 16.2 | 1.56 | 9.9 | ..... | ..... | ..... | ..... | 2.77 | 222 | ..... | ..... |
| 30 | 1.65 | 16.2 | 1.54 | 8.6 | ..... | ..... | ..... | ..... | 2.75 | 216 | ..... | ..... |
| 31 | 1.67 | 17.8 | ..... | ..... | ..... | ..... | ..... | ..... | 2.70 | 202 | ...*c*... | ..... |

*a* Gauge height interpolated.
*b–c* No gauge height observations made.

MONTHLY DISCHARGE of Stimson Creek near Pekisko, for 1915.

(Drainage area 78 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (18–31) | 126 | 16.2 | 44.0 | 0.562 | 0.29 | 1,219 |
| April | 35 | 3.2 | 18.6 | 0.238 | 0.27 | 1,107 |
| May (1–13, 20) | 326 | 8.0 | 95.0 | 1.223 | 0.64 | 2,649 |
| June a | ..... | ..... | ..... | ..... | ..... | ..... |
| July (2–31) | 442 | 202.0 | 308.0 | 3.949 | 4.41 | 18,327 |
| August (1–21) | 216 | 46.0 | 116.0 | 1.487 | 1.16 | 4,832 |
| The period | ..... | ..... | ..... | ..... | 6.77 | 28,134 |

a Records for one day only available.

FINDLAY AND MCDOUGAL DITCH FROM HIGHWOOD RIVER.

*Location.*—On SW. ¼ Sec. 31, Tp. 18, Rge. 29, W. 4th Mer., about four and one-half miles west of the town of High River.

*Records available.*—June 17, 1911, to October 8, 1915.

*Gauge.*—Vertical staff. Zero elevation maintained at 99.25 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Soft mud liable to shift.

*Discharge measurements.*—By wading.

*Winter flow.*—Ditch closed off at freeze-up.

*Artificial control.*—Discharge at station may be controlled by means of the headgates about one-quarter of a mile above station.

*Observer.*—No observations of daily gauge height during 1914–15.

DISCHARGE MEASUREMENTS of Findlay and McDougal Ditch from Highwood River, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| June 23 | H. B. R. Thompson | ..... | ..... | ..... | ..... | Nil. |
| Aug. 7 | do | 6.3 | 2.37 | 0.81 | 1.03 | 1.91 |
| Sept. 8 | do | 7.0 | 3.85 | 0.60 | 1.20 | 2.30 |
| Oct. 8 | do | 6.5 | 0.34 | 0.34 | 0.90 | 0.70 |

LITTLE BOW DITCH FROM HIGHWOOD RIVER.

*Location.*—On the SW. ¼ Sec. 6, Tp. 19, Rge. 28, W. 4th Mer., about 100 feet from the power station and pumping plant of the town of High River.

*Records available.*—August 1, 1910, to December 31, 1915.

*Gauge.*—Vertical staff. Zero elevation maintained at 91.06 feet during 1910–11. Zero elevation maintained at 92.06 feet during 1912–15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Fairly permanent.

*Discharge measurements.*—Made by wading.

*Winter flow.*—Continuous records kept during winter.

*Artificial control.*—Formed by headgates of ditch about twenty feet below station.

*Observer.*—Philip Weinard.

DISCHARGE MEASUREMENTS of Little Bow Ditch from Highwood River, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq.-ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 5 | R. J. McGuinness | 13.8 | 14.20 | 0.53 | 0.42 | 7.60 |
| Jan. 22 | H. S. Kerby | 13.5 | 15.15 | 0.46 | 0.70 | 6.90 |
| Feb. 17 | H. W. Rowley | 13.2 | 11.32 | 0.57 | 0.32 | 6.40 |
| Mar. 4 | do | 13.0 | 12.25 | 0.60 | 0.42 | 7.40 |
| Mar. 26 | R. J. McGuinness | 12.8 | 10.20 | 0.56 | 0.27 | 5.60 |
| April 20 | do | 13.9 | 11.90 | 0.66 | 0.38 | 7.80 |
| May 19 | do | 12.5 | 20.90 | 1.62 | 1.33 | 34.00 |
| June 23 | H. B. R. Thompson | 12.5 | 20.30 | 1.85 | 1.40 | 38.00 |
| Aug. 7 | do | 13.3 | 11.52 | 1.66 | 0.70 | 19.10 |
| Sept. 9 | do | 17.1 | 10.26 | 0.65 | 0.25 | 6.70 |
| Oct. 8 | do | 17.0 | 9.86 | 0.55 | 0.20 | 5.50 |
| Nov. 10 | F. K. Beach | 9.1 | 0.93 | 0.17 | 0.04 | 0.16 |
| Nov. 10 | do | ..... | ..... | ..... | 0.16 | Nil.a |
| Dec. 16 | do | ..... | ..... | ..... | Dry. | Nil. |

*a* Water standing in pools.

DAILY GAUGE HEIGHT AND DISCHARGE of Little Bow Ditch from Highwood River, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 0.34 | 6.3 | 0.64 | 12.5 | 0.27 | 5.0 | 0.28 | 5.2 | 0.53 | 10 | 1.13 | 27 |
| 2 | 0.32 | 5.9 | 0.47 | 8.9 | 0.34 | 6.3 | 0.27 | 5.0 | 0.86 | 19 | 1.67 | 48 |
| 3 | 0.31 | 5.7 | 0.45 | 8.5 | 0.31 | 5.7 | 0.29 | 5.4 | 0.76 | 16 | 1.76 | 52 |
| 4 | 0.31 | 5.7 | 0.42 | 7.9 | 0.35 | 6.5 | 0.31 | 5.7 | 0.62 | 12 | 1.55 | 43 |
| 5 | 0.55 | 10.5 | 0.39 | 7.3 | 0.28 | 5.2 | 0.29 | 5.4 | 0.62 | 12 | 1.77 | 52 |
| 6 | 0.33 | 6.1 | 0.35 | 6.5 | 0.33 | 6.1 | 0.27 | 5.0 | 0.75 | 16 | 1.68 | 48 |
| 7 | 0.34 | 6.3 | 0.35 | 6.5 | 0.29 | 5.4 | 0.29 | 5.4 | 0.71 | 14 | 1.57 | 44 |
| 8 | 0.34 | 6.3 | 0.35 | 6.5 | 0.36 | 6.7 | 0.27 | 5.0 | 1.26 | 31 | 1.67 | 48 |
| 9 | 0.35 | 6.5 | 0.31 | 5.7 | 0.38 | 7.1 | 0.27 | 5.0 | 1.56 | 43 | 1.58 | 44 |
| 10 | 0.34 | 6.3 | 0.34 | 6.3 | 0.26 | 4.9 | 0.28 | 5.2 | 1.47 | 40 | 1.23 | 30 |
| 11 | 0.35 | 6.5 | 0.39 | 7.3 | 0.33 | 6.1 | 0.27 | 5.0 | 1.21 | 29 | 1.20 | 29 |
| 12 | 0.34 | 6.3 | 0.35 | 6.5 | 0.34 | 6.3 | 0.28 | 5.2 | 0.92 | 21 | 1.43 | 38 |
| 13 | 0.34 | 6.3 | 0.30 | 5.5 | 0.29 | 5.4 | 0.27 | 5.0 | 0.85 | 18 | 1.39 | 37 |
| 14 | 0.50 | 9.5 | 0.44 | 8.3 | 0.28 | 5.2 | 0.29 | 5.4 | 1.76 | 52 | 1.68 | 48 |
| 15 | 0.39 | 7.3 | 0.33 | 6.1 | 0.34 | 6.3 | 0.30 | 5.5 | 1.61 | 45 | 1.72 | 50 |
| 16 | 0.41 | 7.7 | 0.30 | 5.5 | 0.42 | 7.9 | 0.30 | 5.5 | 1.73 | 50 | 1.83 | 55 |
| 17 | 0.30 | 5.5 | 0.32 | 5.9 | 0.48 | 9.1 | 0.30 | 5.5 | 1.68 | 48 | 1.88 | 58 |
| 18 | 0.30 | 5.5 | 0.35 | 6.5 | 0.44 | 8.3 | 0.32 | 5.9 | 1.54 | 43 | 2.31 | 80 |
| 19 | 0.30 | 5.5 | 0.34 | 6.3 | 0.43 | 8.1 | 0.35 | 6.5 | 1.43 | 38 | 2.94 | 116 |
| 20 | 0.33 | 6.1 | 0.34 | 6.3 | 0.41 | 7.7 | 0.36 | 6.7 | 0.97 | 22 | 2.58 | 95 |
| 21 | 0.54 | 10.3 | 0.33 | 6.1 | 0.41 | 7.7 | 0.36 | 6.7 | 1.17 | 28 | 2.31 | 80 |
| 22 | 0.45 | 8.5 | 0.35 | 6.5 | 0.38 | 7.1 | 0.37 | 6.9 | 0.88 | 19 | 2.13 | 70 |
| 23 | 0.35 | 6.5 | 0.31 | 5.7 | 0.34 | 6.3 | 0.37 | 6.9 | 1.17 | 28 | 2.12 | 70 |
| 24 | 0.40 | 7.5 | 0.33 | 6.1 | 0.32 | 5.9 | 0.37 | 6.9 | 1.49 | 41 | 2.13 | 70 |
| 25 | 0.39 | 7.3 | 0.34 | 6.3 | 0.37 | 6.9 | 0.35 | 6.5 | 1.77 | 52 | 2.35 | 82 |
| 26 | 0.45 | 8.5 | 0.33 | 6.1 | 0.37 | 6.9 | 0.35 | 6.5 | 1.86 | 57 | 5.95 | 324 |
| 27 | 0.50 | 9.5 | 0.34 | 6.3 | 0.29 | 5.4 | 0.36 | 6.7 | 1.74 | 51 | 3.42 | 147 |
| 28 | 0.46 | 8.7 | 0.34 | 6.3 | 0.27 | 5.0 | 0.35 | 6.5 | 1.73 | 50 | 1.80 | 54 |
| 29 | 0.60 | 11.5 | ..... | ..... | 0.23 | 4.4 | 0.35 | 6.5 | 1.77 | 52 | 1.45 | 39 |
| 30 | 0.67 | 13.2 | ..... | ..... | 0.24 | 4.6 | 0.39 | 7.3 | 1.58 | 44 | 1.22 | 30 |
| 31 | 0.64 | 12.5 | ..... | ..... | 0.24 | 4.6 | ..... | ..... | 1.28 | 32 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Little Bow Ditch from Highwood River, for 1915. —*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.22 | 30.00 | 1.62 | 46.00 | 0.15 | 3.20 | 0.17 | 3.60 | 0.03 | 1.45 | Dry. | Nil. |
| 2 | 0.75 | 15.50 | 1.45 | 39.00 | 0.23 | 4.40 | 0.32 | 5.90 | 0.21 | 4.20 | 1.76 | 52.00 |
| 3 | 0.60 | 11.50 | 1.43 | 38.00 | 0.25 | 4.80 | 0.32 | 5.90 | 0.05 | 1.75 | 0.33 | 6.10 |
| 4 | 0.60 | 11.50 | 1.00 | 23.00 | 0.25 | 4.80 | 0.29 | 5.40 | 0.04 | 1.60 | Dry. | Nil. |
| 5 | 0.30 | 5.50 | 0.69 | 13.80 | 0.00 | 1.00 | 0.22 | 4.30 | 0.01 | 1.15 | " | " |
| 6 | 0.20 | 4.00 | 0.55 | 10.50 | 0.20 | 4.00 | 0.26 | 4.90 | 0.00 | 1.00 | " | " |
| 7 | 0.20 | 4.00 | 0.45 | 8.50 | 0.15 | 3.20 | 0.24 | 4.60 | Dry. | Nil. | 0.00 | 1.00 |
| 8 | 0.05 | 1.75 | 0.65 | 12.80 | 0.20 | 4.00 | 0.22 | 4.30 | 0.01 | 1.15 | 0.01 | 1.15 |
| 9 | Dry. | Nil. | 0.25 | 4.80 | 0.25 | 4.80 | 0.10 | 2.50 | 0.14 | 3.10 | 0.06 | 1.90 |
| 10 | " | " | 0.20 | 4.00 | 0.12 | 2.80 | 0.12 | 2.80 | Dry. | Nil. | 0.00 | 1.00 |
| 11 | " | " | 0.12 | 2.80 | 0.07 | 2.00 | 0.12 | 2.80 | " | " | 0.66 | 13.00 |
| 12 | " | " | 0.07 | 2.00 | 0.07 | 2.00 | 0.10 | 2.50 | 0.30 | 5.50 | 0.66 | 13.00 |
| 13 | 0.67 | 13.20 | 0.18 | 3.70 | 0.06 | 1.90 | 0.09 | 2.40 | 0.01 | 1.15 | −0.04 | 0.50 |
| 14 | 0.18 | 3.70 | 0.05 | 1.75 | 0.02 | 1.30 | 0.09 | 2.40 | Dry. | Nil. | −0.09 | 0.25 |
| 15 | 0.18 | 3.70 | 0.05 | 1.75 | 0.02 | 1.30 | 0.12 | 2.80 | " | " | −0.14 | 0.10 |
| 16 | 0.28 | 5.20 | 0.03 | 1.45 | 0.02 | 1.30 | 0.10 | 2.50 | " | " | Dry. | Nil. |
| 17 | 1.43 | 3.80 | 0.10 | 2.50 | 0.00 | 1.00 | 0.08 | 2.20 | " | " | " | " |
| 18 | 1.66 | 47.00 | 0.05 | 1.75 | 0.02 | 1.30 | 0.08 | 2.20 | " | " | " | " |
| 19 | 1.47 | 40.00 | 0.30 | 5.50 | 0.06 | 1.90 | 0.10 | 2.50 | " | " | " | " |
| 20 | 1.45 | 39.00 | 0.55 | 10.50 | 0.06 | 1.90 | 0.12 | 2.80 | " | " | " | " |
| 21 | 1.17 | 28.00 | 0.30 | 5.50 | 0.02 | 1.30 | 0.11 | 2.60 | " | " | " | " |
| 22 | 1.07 | 25.00 | 0.10 | 2.50 | 0.02 | 1.30 | 0.08 | 2.20 | 0.81 | 17.30 | " | " |
| 23 | 0.96 | 22.00 | 0.05 | 1.75 | 0.10 | 2.50 | 0.11 | 2.60 | 1.56 | 43.00 | " | " |
| 24 | 0.86 | 18.80 | 0.05 | 1.75 | 0.62 | 12.00 | 0.08 | 2.20 | 1.56 | 43.00 | " | " |
| 25 | 1.44 | 39.00 | 0.52 | 9.90 | 0.62 | 12.00 | 0.04 | 1.60 | 1.34 | 34.00 | " | " |
| 26 | 1.44 | 39.00 | 0.50 | 9.50 | 0.00 | 1.00 | 0.03 | 1.45 | 1.14 | 27.00 | " | " |
| 27 | 1.82 | 55.00 | 0.40 | 7.50 | 0.32 | 5.90 | 0.06 | 1.90 | 1.01 | 23.00 | " | " |
| 28 | 1.86 | 57.00 | 0.40 | 7.50 | 0.29 | 5.40 | 0.05 | 1.80 | 0.00 | 1.00 | " | " |
| 29 | 1.81 | 54.00 | 0.00 | 1.00 | 0.15 | 3.20 | 0.02 | 1.30 | 0.00 | 1.00 | " | " |
| 30 | 1.53 | 42.00 | 0.00 | 1.00 | 0.15 | 3.20 | 0.02 | 1.30 | 0.96 | 22.00 | " | " |
| 31 | 1.37 | 36.00 | 0.22 | 4.30 | ..... | ..... | Dry. | Nil. | ..... | ... | " | " |

MONTHLY DISCHARGE of Little Bow Ditch from Highwood River, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| January | 13.2 | 5.50 | 7.6 | 467 |
| February | 12.5 | 5.50 | 6.8 | 378 |
| March | 9.1 | 4.40 | 6.3 | 387 |
| April | 7.3 | 5.00 | 5.9 | 351 |
| May | 57.0 | 10.00 | 33.0 | 2,029 |
| June | 324.0 | 27.00 | 67.0 | 3,987 |
| July | 57.0 | 0.00 | 21.0 | 1,291 |
| August | 46.0 | 1.00 | 9.2 | 566 |
| September | 12.0 | 1.00 | 3.4 | 202 |
| October | 5.9 | 0.00 | 2.8 | 172 |
| November | 43.0 | 0.00 | 7.8 | 464 |
| December | 52.0 | 0.00 | 2.9 | 178 |
| The year | | | | 10,472 |

HIGHWOOD RIVER AT HIGH RIVER.

*Location.*—On the NW. ¼ Sec. 6, Tp. 19, Rge. 28, W. 4th Mer., at the new steel traffic bridge in the town of High River.

*Records available.*—May 28, 1908, to December 31, 1915.

*Gauge.*—Chain gauge. Elevation of zero of gauge was 3,381.66 during 1908–13. Elevation of zero of gauge was 3,379.74 during 1914–15.

*Bench-mark.*—Permanent iron bench-mark, 128 feet N. 60° E. from SE. corner of stream face of right abutment. Elevation, 3,389.60. (Canadian Pacific Railway Company's datum.)

*Channel.*—Fairly permanent.

*Discharge measurements.*—From bridge.

*Winter flow.*—Observations taken the whole year.

*Floods.*—The highest recorded flow in recent years occurred June 26, 1915, when the stream at this point had an estimated discharge of 8,335 sec.-ft. In addition to the discharge at the station there was a discharge of some 4,000 sec.-ft. through Lineham spillway.

*Diversions.*—The Little Bow Ditch diverts water about two miles above the station.

*Observer.*—Philip Weinard.

DISCHARGE MEASUREMENTS of Highwood River at High River, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 5 | R. J. McGuinness | 75.0 | 156.0 | 0.63 | 3.62 | 98.0 |
| Jan. 22 | H. S. Kerby | 75.0 | 134.0 | 0.58 | 3.52 | 78.0 |
| Feb. 17 | H. W. Rowley | 75.0 | 141.5 | 0.54 | 3.59 | 75.0 |
| Mar. 4 | do | 73.0 | 138.0 | 0.54 | 3.59 | 75.0 |
| Mar. 26 | R. J. McGuinness | 113.0 | 207.0 | 0.40 | 3.75 | 84.0 |
| April 20 | do | 136.0 | 309.9 | 1.58 | 4.51 | 490.0 |
| May 19 | do | 158.0 | 580.3 | 3.75 | 5.89 | 2,177.0 |
| June 23 | H. B. R. Thompson | 160.0 | 607.0 | 4.58 | 6.23 | 2,781.0 |
| June 26 | do | 172.5 | 1,188.0 | 7.02 | 9.35 | 8,335.0 |
| June 29 | do | 172.5 | 980.0 | 4.04 | 7.13 | 3,960.0 |
| July 1 | do | 172.0 | 963.0 | 3.90 | 7.10 | 3,757.0 |
| Aug. 7 | do | 154.0 | 610.5 | 1.61 | 5.23 | 983.0 |
| Sept. 8 | do | 160.0 | 484.4 | 0.84 | 4.52 | 405.0 |
| Oct. 8 | do | 160.0 | 483.1 | 0.83 | 4.445 | 401.0 |
| Nov. 10 | F. K. Beach | 149.0 | 435.5 | 0.46 | 4.035 | 200.0 |
| Dec. 16 | do | 119.0 | 312.0 | 0.44 | 3.70 | 139.0 |

DAILY GAUGE HEIGHT AND DISCHARGE of Highwood River at High River, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.67 | 94 | 3.64 | 75 | 3.63 | 76 | 3.58 | 61 | 4.94 | 900 | 5.70 | 1,890 |
| 2 | 3.68 | 95 | 3.50 | 69 | 3.54 | 76 | 3.71 | 92 | 5.43 | 1,485 | 5.84 | 2,104 |
| 3 | 3.67 | 96 | 3.54 | 70 | 3.54 | 76 | 3.95 | 168 | 5.47 | 1,545 | 5.91 | 2,216 |
| 4 | 3.66 | 97 | 3.59 | 71 | 3.57 | 76 | 3.95 | 168 | 5.24 | 1,248 | 5.73 | 1,935 |
| 5 | 3.62 | 98 | 3.59 | 71 | 3.54 | 76 | 3.97 | 174 | 5.29 | 1,308 | 5.91 | 2,216 |
| 6 | 3.42 | 93 | 3.53 | 72 | 3.59 | 76 | 3.88 | 143 | 5.26 | 1,272 | 5.83 | 2,088 |
| 7 | 3.47 | 94 | 3.56 | 73 | 3.59 | 76 | 3.83 | 126 | 5.43 | 1,485 | 5.83 | 2,088 |
| 8 | 3.53 | 94 | 3.60 | 73 | 3.49 | 76 | 3.91 | 154 | 5.77 | 1,995 | 5.91 | 2,216 |
| 9 | 3.62 | 93 | 3.55 | 74 | 3.49 | 76 | 3.81 | 118 | 5.91 | 2,216 | 5.79 | 2,025 |
| 10 | 3.62 | 92 | 3.60 | 74 | 3.49 | 75 | 3.72 | 95 | 5.79 | 2,025 | 5.71 | 1,905 |
| 11 | 3.61 | 92 | 3.48 | 74 | 3.56 | 74 | 3.67 | 83 | 5.68 | 1,860 | 5.64 | 1,800 |
| 12 | 3.60 | 92 | 3.40 | 74 | 3.48 | 74 | 3.82 | 122 | 5.47 | 1,545 | 5.70 | 1,890 |
| 13 | 3.60 | 92 | 3.47 | 75 | 3.48 | 75 | 3.91 | 154 | 5.52 | 1,620 | 5.77 | 1,995 |
| 14 | 3.61 | 90 | 3.45 | 76 | 3.53 | 74 | 4.01 | 185 | 6.62 | 3,416 | 5.89 | 2,184 |
| 15 | 3.29 | 83 | 3.51 | 76 | 3.58 | 73 | 4.05 | 205 | 6.30 | 2,840 | 5.99 | 2,344 |
| 16 | 3.52 | 84 | 3.48 | 76 | 3.65 | 73 | 4.07 | 215 | 6.01 | 2,376 | 6.07 | 2,472 |
| 17 | 3.57 | 85 | 3.54 | 76 | 3.70 | 73 | 4.12 | 240 | 5.88 | 2,168 | 6.09 | 2,504 |
| 18 | 3.52 | 85 | 3.49 | 76 | 3.65 | 74 | 4.41 | 418 | 5.96 | 2,296 | 6.50 | 3,200 |
| 19 | 3.54 | 83 | 3.58 | 75 | 3.60 | 76 | 4.40 | 410 | 5.82 | 2,072 | 6.91 | 3,938 |
| 20 | 3.51 | 82 | 3.60 | 74 | 3.65 | 78 | 4.50 | 490 | 5.64 | 1,800 | 6.68 | 3,524 |
| 21 | 3.51 | 79 | 3.54 | 72 | 3.71 | 79 | 4.45 | 450 | 5.67 | 1,845 | 6.33 | 2,894 |
| 22 | 3.40 | 78 | 3.54 | 72 | 3.69 | 80 | 4.45 | 450 | 5.60 | 1,740 | 6.16 | 2,616 |
| 23 | 3.49 | 77 | 3.44 | 72 | 3.74 | 82 | 4.45 | 450 | 5.73 | 1,935 | 6.12 | 2,552 |
| 24 | 3.43 | 76 | 3.54 | 73 | 3.78 | 110 | 4.34 | 368 | 5.90 | 2,200 | 6.14 | 2,584 |
| 25 | 3.50 | 73 | 3.48 | 74 | 3.54 | 52 | 4.31 | 347 | 5.99 | 2,344 | 6.25 | 2,760 |
| 26 | 3.54 | 71 | 3.51 | 75 | 3.85 | 132 | 4.31 | 347 | 6.10 | 2,520 | 9.18 | 8,024 |
| 27 | 3.54 | 70 | 3.57 | 75 | 3.35 | 30 | 4.35 | 375 | 6.00 | 2,360 | 8.32 | 6,476 |
| 28 | 3.59 | 70 | 3.57 | 75 | 3.35 | 30 | 4.30 | 340 | 5.94 | 2,264 | 7.46 | 4,928 |
| 29 | 3.56 | 73 | ..... | ..... | 3.52 | 49 | 4.30 | 340 | 5.99 | 2,344 | 7.06 | 3,760 |
| 30 | 3.61 | 75 | ..... | ..... | 3.48 | 43 | 4.35 | 375 | 5.83 | 2,088 | 6.80 | 3,240 |
| 31 | 3.64 | 75 | ..... | ..... | 3.60 | 66 | ..... | ..... | 5.71 | 1,905 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Highwood River at High River, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 7.08 | 3,800 | 5.82 | 1,648 | 4.35 | 325 | 4.48 | 398 | 4.30 | 300 | 3.75 | 148 |
| 2 | 6.62 | 2,916 | 5.80 | 1,620 | 4.37 | 335 | 4.50 | 410 | 4.28 | 290 | 3.85 | 150 |
| 3 | 6.60 | 2,880 | 5.60 | 1,380 | 4.35 | 325 | 4.50 | 410 | 4.19 | 246 | 3.90 | 152 |
| 4 | 6.32 | 2,392 | 5.50 | 1,260 | 4.25 | 275 | 4.52 | 422 | 4.23 | 265 | 4.00 | 154 |
| 5 | 6.20 | 2,200 | 5.45 | 1,200 | 4.30 | 300 | 4.49 | 404 | 4.15 | 230 | 3.98 | 151 |
| 6 | 6.11 | 2,056 | 5.25 | 990 | 4.35 | 325 | 4.47 | 392 | 4.10 | 210 | 4.00 | 146 |
| 7 | 6.36 | 2,456 | 5.23 | 970 | 4.43 | 368 | 4.47 | 392 | 3.90 | 140 | 3.95 | 140 |
| 8 | 6.32 | 2,392 | 5.10 | 850 | 4.52 | 422 | 4.47 | 392 | 3.89 | 138 | 4.00 | 139 |
| 9 | 6.10 | 2,040 | 5.00 | 760 | 4.50 | 410 | 4.47 | 392 | 4.09 | 206 | 4.25 | 143 |
| 10 | 5.95 | 1,830 | 5.00 | 760 | 4.60 | 470 | 4.51 | 416 | 4.03 | 182 | 3.85 | 137 |
| 11 | 5.85 | 1,690 | 4.95 | 720 | 4.52 | 422 | 3.59 | 464 | 4.10 | 210 | 3.80 | 136 |
| 12 | 5.78 | 1,596 | 4.90 | 680 | 4.47 | 392 | 4.45 | 380 | 3.75 | 102 | 3.80 | 136 |
| 13 | 5.70 | 1,500 | 5.00 | 760 | 4.37 | 335 | 4.48 | 398 | 3.75 | 102 | 3.90 | 138 |
| 14 | 6.30 | 2,360 | 4.95 | 720 | 4.37 | 335 | 4.59 | 464 | 3.95 | 155 | 3.80 | 138 |
| 15 | 5.98 | 1,872 | 4.95 | 720 | 4.34 | 320 | 4.38 | 340 | 3.90 | 142 | 3.78 | 139 |
| 16 | 5.88 | 1,732 | 4.90 | 680 | 4.30 | 300 | 4.37 | 335 | 4.13 | 200 | 3.70 | 139 |
| 17 | 6.21 | 2,216 | 4.87 | 659 | 4.25 | 275 | 4.32 | 310 | 4.04 | 186 | 3.75 | 140 |
| 18 | 6.20 | 2,200 | 4.90 | 680 | 4.25 | 275 | 4.31 | 305 | 4.08 | 180 | 3.70 | 141 |
| 19 | 6.00 | 1,900 | 5.28 | 1,020 | 4.27 | 285 | 4.33 | 315 | 4.03 | 174 | 3.53 | 143 |
| 20 | 5.80 | 1,620 | 5.47 | 1,224 | 4.30 | 300 | 4.33 | 315 | 4.05 | 136 | 3.40 | 146 |
| 21 | 5.62 | 1,404 | 5.07 | 823 | 4.27 | 285 | 4.35 | 325 | 3.85 | 138 | 3.60 | 152 |
| 22 | 5.52 | 1,284 | 4.90 | 680 | 4.25 | 275 | 4.35 | 325 | 3.90 | 140 | 4.50 | 158 |
| 23 | 5.50 | 1,260 | 4.82 | 624 | 4.20 | 250 | 4.35 | 325 | 4.00 | 150 | 4.00 | 148 |
| 24 | 5.52 | 1,284 | 4.70 | 540 | 4.60 | 470 | 4.36 | 330 | 4.15 | 163 | 3.67 | 142 |
| 25 | 5.92 | 1,788 | 4.60 | 470 | 4.55 | 440 | 4.32 | 310 | 4.00 | 136 | 3.57 | 129 |
| 26 | 5.80 | 1,620 | 4.58 | 458 | 4.55 | 440 | 4.21 | 255 | 4.00 | 135 | 3.63 | 126 |
| 27 | 6.00 | 1,900 | 4.45 | 380 | 4.50 | 410 | 4.31 | 305 | 3.98 | 132 | 3.74 | 128 |
| 28 | 5.85 | 1,690 | 4.40 | 350 | 4.47 | 392 | 4.31 | 305 | 3.85 | 128 | 3.85 | 131 |
| 29 | 6.00 | 1,900 | 4.37 | 335 | 4.47 | 392 | 4.33 | 315 | 3.60 | 124 | 3.85 | 133 |
| 30 | 5.85 | 1,690 | 4.42 | 362 | 4.45 | 380 | 4.32 | 310 | 3.65 | 147 | 3.70 | 134 |
| 31 | 5.85 | 1,690 | 4.40 | 350 | ..... | ..... | 4.32 | 310 | ..... | ..... | 3.74 | 131 |

MONTHLY DISCHARGE of Highwood River at High River, for 1915.

(Drainage area 746 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 98 | 70 | 85 | 0.114 | 0.13 | 5,226 |
| February | 76 | 69 | 74 | 0.099 | 0.10 | 4,110 |
| March | 132 | 30 | 66 | 0.088 | 0.10 | 4,058 |
| April | 490 | 61 | 255 | 0.342 | 0.38 | 15,174 |
| May | 3,416 | 900 | 1,968 | 2.638 | 3.04 | 121,008 |
| June | 8,024 | 1,800 | 2,879 | 3.859 | 4.31 | 171,311 |
| July | 3,800 | 1,260 | 1,973 | 2.645 | 3.05 | 121,314 |
| August | 1,648 | 335 | 796 | 1.067 | 1.23 | 48,949 |
| September | 470 | 250 | 351 | 0.470 | 0.52 | 20,886 |
| October | 464 | 255 | 357 | 0.479 | 0.55 | 21,951 |
| November | 300 | 102 | 173 | 0.232 | 0.26 | 10,294 |
| December | 158 | 126 | 141 | 0.189 | 0.22 | 8,670 |
| The year | ..... | ..... | ..... | ..... | 13.89 | 552,951 |

HIGHWOOD RIVER NEAR ALDERSYDE.

*Location.*—On NW. ¼ Sec. 17, Tp. 20, Rge. 28, W. 4th Mer., at L. W. Barret's ranch about three miles northeast of Aldersyde.

*Records available.*—From October 3, 1911, to October 31, 1915.

*Gauge.*—Standard chain gauge. The elevation of zero has been maintained at 90.64 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.
*Channel.*—Probably permanent. Large stones and boulders in and near section.
*Discharge measurements.*—From traffic bridge or by wading.
*Winter flow.*—No observations taken during winter months.
*Flood.*—The highest recorded discharge took place June 26, 1915, when the water level at this point was 98.34 feet with an estimated flow of 13,980 sec.-ft. (See Highwood River at High River.)
*Observer.*—D. W. Barret.

DISCHARGE MEASUREMENTS of Highwood River near Aldersyde, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 15 | R. J. McGuinness | 131.0 | 187 | 1.68 | 1.31 | 314 |
| May 11 | do | 211.0 | 487 | 4.25 | 2.88 | 2,070 |
| June 18 | H. B. R. Thompson | 220.0 | 708 | 5.40 | 3.60 | 3,822 |
| June 26 | do | 238.0 | 1,626 | 8.59 | 7.70 | 13,980*a* |
| Aug. 3 | do | 189.0 | 399 | 3.95 | 2.62 | 2,625 |
| Sept. 2 | do | 147.0 | 226 | 1.75 | 1.60 | 396 |
| Sept. 30 | do | 152.0 | 238 | 2.13 | 1.71 | 507 |
| Nov. 5 | F. K. Beach | 139.5 | 218 | 1.62 | 1.53 | 353 |

*a* Slope estimate.

DAILY GAUGE HEIGHT AND DISCHARGE of Highwood River, near Aldersyde, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.65 | 62 | 1.96 | 736 | 2.91 | 2,036 |
| 2 | ..... | ..... | 2.62 | 93 | 2.31 | 1,154 | 3.05 | 2,270 |
| 3 | ..... | ..... | 2.52 | 168 | 2.63 | 1,602 | 3.18 | 2,504 |
| 4 | ..... | ..... | 2.51 | 180 | 2.43 | 1,322 | 3.00 | 2,180 |
| 5 | ..... | ..... | 1.42 | 244 | 2.45 | 1,350 | 3.16 | 2,468 |
| 6 | ..... | ..... | 1.40 | 230 | 2.47 | 1,378 | 3.19 | 2,522 |
| 7 | ..... | ..... | 1.39 | 223 | 2.45 | 1,350 | 3.14 | 2,432 |
| 8 | ..... | ..... | 1.37 | 209 | 2.73 | 1,748 | 3.10 | 2,360 |
| 9 | ..... | ..... | 1.34 | 188 | 3.02 | 2,216 | 3.01 | 2,198 |
| 10 | ..... | ..... | 1.21 | 106 | 2.93 | 2,068 | 2.96 | 2,116 |
| 11 | ..... | ..... | 1.12 | 52 | 2.96 | 2,116 | 2.88 | 1,988 |
| 12 | ..... | ..... | 1.11 | 46 | 2.69 | 1,686 | 2.86 | 1,956 |
| 13 | ..... | ..... | 1.18 | 88 | 2.57 | 1,518 | 2.98 | 2,148 |
| 14 | ..... | ..... | 1.41 | 237 | 3.84 | 3,700 | 3.00 | 2,180 |
| 15 | ..... | ..... | 1.34 | 188 | 3.67 | 3,386 | 3.25 | 2,630 |
| 16 | ..... | ..... | 1.37 | 209 | 3.37 | 2,846 | 3.41 | 2,918 |
| 17 | 3.72 | 73 | 1.39 | 223 | 3.15 | 2,450 | 3.26 | 2,648 |
| 18 | 3.70 | 75 | 1.54 | 332 | 3.12 | 2,396 | 3.56 | 3,188 |
| 19 | 3.69 | 78 | 1.61 | 389 | 3.20 | 2,540 | 4.06 | 4,140 |
| 20 | 3.61 | 77 | 1.70 | 470 | 2.98 | 2,148 | 4.25 | 4,525 |
| 21 | 3.28 | 80 | 1.72 | 490 | 2.92 | 2,052 | 3.67 | 3,386 |
| 22 | 2.97 | 75 | 1.67 | 443 | 2.89 | 2,004 | 3.64 | 3,332 |
| 23 | 2.85 | 72 | 1.56 | 348 | 2.92 | 2,052 | 3.36 | 2,828 |
| 24 | 2.87 | 96 | 1.54 | 332 | 3.00 | 2,180 | 3.28 | 2,684 |
| 25 | 2.67 | 100 | 1.56 | 348 | 3.22 | 2,576 | 3.30 | 2,720 |
| 26 | 2.77 | 135 | 1.53 | 324 | 3.24 | 2,612 | 6.94 | 11,640 |
| 27 | 2.56 | 60 | 1.57 | 356 | 3.23 | 2,594 | 6.59 | 10,590 |
| 28 | 2.62 | 64 | 1.59 | 372 | 3.17 | 2,486 | 4.83 | 5,812 |
| 29 | 2.66 | 50 | 1.56 | 348 | 3.11 | 2,378 | 3.40 | 2,900 |
| 30 | 2.63 | 45 | 1.62 | 398 | 3.09 | 2,342 | 4.07 | 4,160 |
| 31 | 2.77 | 65 | ..... | ..... | 2.94 | 2,084 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Highwood River, near Aldersyde, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 4.09 | 4,200 | 2.90*d* | 2,020 | 1.55 | 340 | 1.73 | 500 |
| 2 | 4.01 | 4,040 | 3.06 | 2,288 | 1.60 | 380 | 1.71 | 480 |
| 3 | 3.70 | 3,440 | 2.62 | 1,588 | 1.59 | 372 | 1.74 | 510 |
| 4 | 3.39 | 2,882 | 2.56 | 1,504 | 1.57 | 356 | 1.75 | 520 |
| 5 | 3.37 | 2,846 | 2.54 | 1,476 | 1.55 | 340 | 1.73 | 500 |
| 6 | 3.27 | 2,666 | 2.41 | 1,294 | 1.53 | 324 | 1.72 | 490 |
| 7 | 3.32 | 2,756 | 2.28 | 1,114 | 1.56 | 348 | 1.70 | 470 |
| 8 | 3.40 | 2,900 | 2.16 | 962 | 1.98 | 650 | 1.69 | 461 |
| 9 | 3.33 | 2,774 | 2.14 | 938 | 1.76 | 530 | 1.68 | 452 |
| 10 | 3.03 | 2,234 | 2.12 | 814 | 1.92 | 692 | 1.68 | 452 |
| 11 | 2.74 | 1,764 | 2.09 | 870 | 1.89 | 660 | 1.68 | 452 |
| 12 | 2.72 | 1,732 | 2.04 | 824 | 1.70 | 470 | 1.67 | 443 |
| 13 | 2.59 | 1,546 | 2.02 | 802 | 1.67 | 443 | 1.66 | 434 |
| 14 | 3.18 | 2,504 | 2.11 | 902 | 1.59 | 372 | 1.66 | 434 |
| 15 | 3.37 | 2,846 | 2.16 | 962 | 1.57 | 356 | 1.66 | 434 |
| 16 | 3.12 | 2,396 | 2.08*d* | 868 | 1.56 | 348 | 1.64 | 416 |
| 17 | 3.33 | 2,774 | 2.01 | 791 | 1.55 | 340 | 1.66 | 407 |
| 18 | 3.51 | 3,098 | 2.01 | 791 | 1.55 | 340 | 1.62 | 398 |
| 19 | 3.14 | 2,432 | 2.16 | 962 | 1.54 | 332 | 1.62 | 398 |
| 20 | 2.78 | 1,828 | 2.35 | 1,210 | 1.59 | 372 | 1.61 | 389 |
| 21 | 2.73 | 1,748 | 2.54 | 1,476 | 1.61 | 389 | 1.60 | 380 |
| 22 | 2.59 | 1,546 | 2.19 | 998 | 1.60 | 380 | 1.62 | 398 |
| 23 | 2.53 | 1,462 | 2.04 | 824 | 1.72*d* | 490 | 1.64 | 416 |
| 24 | 2.58 | 1,532 | 1.98 | 758 | 1.83 | 600 | 1.60 | 380 |
| 25 | 3.25 | 2,630 | 1.97 | 747 | 1.97 | 747 | 1.56 | 348 |
| 26 | 2.84 | 1,924 | 1.94 | 714 | 1.92 | 692 | 1.54 | 332 |
| 27 | 2.68 | 1,672 | 1.86 | 630 | 1.87 | 640 | 1.52 | 316 |
| 28 | 2.74 | 1,764 | 1.72 | 490 | 1.78 | 550 | 1.53 | 324 |
| 29 | 3.22 | 2,576 | 1.70 | 470 | 1.76 | 530 | 1.55 | 340 |
| 30 | 3.07 | 2,306 | 1.68 | 452 | 1.71 | 480 | 1.66 | 434 |
| 31 | 2.74 | 1,764 | 1.56 | 348 | ..... | ..... | 1.61 | 389 |

*d* Gauge height interpolated.

MONTHLY DISCHARGE of Highwood River near Aldersyde, for 1915.

(Drainage area 883 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (17-31) | 135 | 45 | 76 | 0.086 | 0.05 | 2,281 |
| April | 490 | 46 | 257 | 0.291 | 0.32 | 15,293 |
| May | 3,700 | 736 | 2,099 | 2.377 | 2.74 | 129,059 |
| June | 11,040 | 1,956 | 3,382 | 3.830 | 4.27 | 201,240 |
| July | 4,200 | 1,462 | 2,406 | 2.725 | 3.14 | 147,940 |
| August | 2,288 | 348 | 1,000 | 1.133 | 1.31 | 61,488 |
| September | 747 | 324 | 462 | 0.523 | 0.58 | 27,491 |
| October | 520 | 316 | 422 | 0.478 | 0.55 | 25,948 |
| The period | | | | | 12.96 | 610,740 |

BOW RIVER NEAR NAMAKA

*Location.*—On the NE. ¼ Sec. 32, Tp. 21, Rge. 25, W. 4th Mer., about one-half mile below the dam of the Southern Alberta Land Company.

*Records available.*—From September, 1909, to October, 1910, from May 13, 1913, to August 22, 1914, and from April 13, 1915, to October 23, 1915.

*Gauge.*—Vertical staff. Elevation of zero maintained at 2,955.13 feet from August 27, 1915, to the end of the year.

*Bench-mark.*—Permanent iron bench-mark on right bank about 25 feet NE. of cable tower. Elevation, 2,962.92 feet. (Canadian Pacific Railway datum.)

*Channel.*—Permanent.

*Discharge measurements.*—Made from cable.

*Observer.*—A. P. Moorhouse.

DISCHARGE MEASUREMENTS of Bow River near Namaka, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq.-ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 13 | R. J. McGuinness | 322 | 1,050 | 1.76 | 0.53 | 1,848 |
| May 4 | do | 248 | 1,602 | 3.11 | 2.20 | 4,984 |
| June 4 | do | 366 | 2,342 | 5.12 | 4.09 | 11,991 |
| July 13 | H. B. R. Thompson | 377 | 2,120 | 5.76 | 4.27 | 12,223 |
| Aug. 20 | do | 377 | 1,964 | 5.64 | 4.09 | 11,085 |
| Sept. 17 | do | 356 | 1,491 | 3.01 | 1.70 | 4,491 |
| Oct. 13 | do | 357 | 1,425 | 2.86 | 1.52 | 4,074 |

DAILY GAUGE HEIGHT AND DISCHARGE of Bow River near Namaka, for 1915.

| Day. | September. | | October. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.76 | 4,544 |
| 2 | 2.45 | 5,940 | 1.76 | 4,544 |
| 3 | 2.40 | 5,830 | 1.80 | 4,620 |
| 4 | 2.10 | 5,210 | 1.75 | 4,525 |
| 5 | 2.10 | 5,210 | 1.66 | 4,358 |
| 6 | 2.10 | 5,210 | 1.66 | 4,358 |
| 7 | 2.35 | 5,725 | 1.66 | 4,358 |
| 8 | 2.60 | 6,270 | 1.60 | 4,250 |
| 9 | 2.65 | 6,385 | 1.58 | 4,214 |
| 10 | 2.50 | 6,050 | 1.56 | 4,178 |
| 11 | 2.35 | 5,725 | 1.54 | 4,142 |
| 12 | 2.20 | 5,410 | 1.50 | 4,070 |
| 13 | 2.05 | 5,110 | 1.52 | 4,106 |
| 14 | 1.90 | 4,810 | 1.40 | 3,900 |
| 15 | 1.90 | 4,810 | 1.38 | 3,866 |
| 16 | 1.80 | 4,620 | 1.36 | 3,832 |
| 17 | 1.70 | 4,430 | 1.35 | 3,815 |
| 18 | 1.68 | 4,394 | 1.35 | 3,815 |
| 19 | 1.70 | 4,430 | 1.34 | 3,798 |
| 20 | 1.90 | 4,810 | 1.34 | 3,798 |
| 21 | 1.88 | 4,772 | 1.33 | 3,781 |
| 22 | 1.70 | 4,430 | 1.32 | 3,764 |
| 23 | 1.75 | 4,525 | 1.30 | 3,730 |
| 24 | 2.26 | 5,536 | ..... | ..... |
| 25 | 2.25 | 5,515 | ..... | ..... |
| 26 | 2.10 | 5,210 | ..... | ..... |
| 27 | 1.95 | 4,910 | ..... | ..... |
| 28 | 1.85 | 4,715 | ..... | ..... |
| 29 | 1.80 | 4,620 | ..... | ..... |
| 30 | 1.80 | 4,620 | ..... | ..... |
| 31 | ..... | ..... | ..... | ..... |

MONTHLY DISCHARGE of Bow River near Namaka, for 1915.

(Drainage area 6,208 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| September | 6,385 | 4,394 | 5,146 | 0.829 | 0.89 | 296,001 |
| October (1-23) | 4,620 | 3,730 | 4,103 | 0.661 | 0.56 | 187,134 |
| The period | | | | | 1.45 | 483,135 |

NORTH BRANCH OF CANADIAN PACIFIC RAILWAY COMPANY CANAL NEAR BASSANO.

*Location.*—On NW. ¼ Sec. 3, Tp. 21, Rge. 18, W. 4th Mer., about three miles southeast of the town of Bassano, and about three and one-half miles east of the Bassano dam.

*Records available.*—From May 1, 1914, to November 8, 1915.

*Gauge.*—Vertical staff in stilling box. Zero of gauge is at elevation of floor of rating flume at measuring section, 90.54 feet.

*Bench-mark.*—Top of left abutment of gauging bridge. Assumed elevation, 100.00 feet.

*Channel.*—Permanent concrete channel.

*Discharge measurements.*—From gauging bridge or by wading underneath.

*Winter flow.*—Ditch closed off at freeze-up.

*Artificial control.*—Discharge at station may be controlled by means of the headgates about 400 feet above the station.

*Co-operation.*—Gauge heights supplied by Canadian Pacific Railway Company.

*Observer.*—The Superintendent of Maintenance and Operation, Canadian Pacific Railway Department of Natural Resources, Brooks, Alta.

DISCHARGE MEASUREMENTS of North Branch of Canadian Pacific Railway Company Canal near Bassano, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq.-ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 8 | R. J. McGuinness | 32.0 | 35.8 | 1.26 | 1.14 | 45.0 |
| May 28 | do | 33.0 | 31.6 | 1.29 | 1.03 | 41.0 |
| May 28 | do | 39.8 | 93.6 | 2.68 | 2.74 | 250.0 |
| May 28 | do | 37.0 | 62.9 | 1.66 | 1.91 | 104.0 |
| May 29 | do | 31.8 | 21.3 | 0.85 | 0.70 | 18.1 |
| July 15 | H. B. R. Thompson | 33.0 | 29.0 | 1.05 | 1.00 | 31.0 |
| Aug. 21 | do | 34.5 | 44.1 | 1.47 | 1.40 | 65.0 |
| Sept. 20 | do | 34.0 | 38.5 | 1.33 | 1.23 | 51.0 |
| Oct. 14 | do | 32.0 | 23.1 | 0.96 | 0.77 | 22.0 |
| Nov. 25 | F. K. Beach | | | | | Nil a |
| Dec. 20 | do | | | | | Nil a |

a Water turned off.

DAILY GAUGE HEIGHT AND DISCHARGE of North Branch of Canadian Pacific Railway Company Canal, near Bassano, for 1915.

| Day. | April. | | May. | | June. | | July. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.30 | 54 | 1.00 | 34 | 1.00 | 34 |
| 2 | ..... | ..... | 1.30 | 54 | 1.00 | 34 | 1.00 | 34 |
| 3 | ..... | ..... | 1.30 | 54 | 1.00 | 34 | 1.00 | 34 |
| 4 | ..... | ..... | 1.30 | 54 | 1.00 | 34 | 1.00 | 34 |
| 5 | ..... | ..... | 1.30 | 54 | 0.50 | 12 | 1.00 | 34 |
| 6 | ..... | ..... | 1.30 | 54 | 0.50 | 12 | 1.00 | 34 |
| 7 | ..... | ..... | 1.30 | 54 | 0.50 | 12 | 1.00 | 34 |
| 8 | ..... | ..... | 1.30 | 54 | 0.80 | 23 | 1.00 | 34 |
| 9 | ..... | ..... | 1.30 | 54 | 0.80 | 23 | 1.00 | 34 |
| 10 | ..... | ..... | 1.30 | 54 | 0.80 | 23 | 1.00 | 34 |
| 11 | ..... | ..... | 1.30 | 54 | 0.80 | 23 | 1.00 | 34 |
| 12 | ..... | ..... | 1.50 | 68 | 0.80 | 23 | 1.00 | 34 |
| 13 | ..... | ..... | 1.50 | 68 | 0.80 | 23 | 1.00 | 34 |
| 14 | ..... | ..... | 1.50 | 68 | 0.80 | 23 | 1.00 | 34 |
| 15 | ..... | ..... | 1.50 | 68 | 1.00 | 34 | 1.00 | 34 |
| 16 | ..... | ..... | 1.00 | 34 | 1.00 | 34 | 1.00 | 34 |
| 17 | ..... | ..... | 0.80 | 23 | 1.00 | 34 | 1.00 | 34 |
| 18 | ..... | ..... | 0.80 | 23 | 1.00 | 34 | 1.05 | 37 |
| 19 | ..... | ..... | 0.80 | 23 | 1.00 | 34 | 1.05 | 37 |
| 20 | 1.30 | 54 | 0.80 | 23 | 1.00 | 34 | 1.05 | 37 |
| 21 | 1.30 | 54 | 0.80 | 23 | 1.00 | 34 | 1.05 | 37 |
| 22 | 1.30 | 54 | 0.80 | 23 | 1.00 | 34 | 1.05 | 37 |
| 23 | 1.30 | 54 | 0.80 | 23 | 1.00 | 34 | 1.05 | 37 |
| 24 | 1.30 | 54 | 0.80 | 23 | 1.00 | 34 | 1.05 | 37 |
| 25 | 1.30 | 54 | 0.80 | 23 | 1.00 | 34 | 1.05 | 37 |
| 26 | 1.30 | 54 | 0.80 | 23 | 1.00 | 34 | 1.05 | 37 |
| 27 | 1.30 | 54 | 0.80 | 23 | 1.00 | 34 | 1.05 | 37 |
| 28 | 1.30 | 54 | 0.80 | 23 | 1.00 | 34 | 1.20 | 47 |
| 29 | 1.30 | 54 | 0.80 | 23 | 1.00 | 34 | 1.20 | 47 |
| 30 | 1.30 | 54 | 0.80 | 23 | 1.00 | 34 | 1.20 | 47 |
| 31 | ..... | ..... | 0.80 | 23 | ..... | ..... | 1.20 | 47 |

DAILY GAUGE HEIGHT AND DISCHARGE of North Branch of Canadian Pacific Railway Company Canal near Bassano, for 1915.—*Concluded.*

| Day. | August. | | September. | | October. | | November. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.20 | 47 | 1.20 | 47 | 1.20 | 47 | 1.00 | 34 |
| 2 | 1.20 | 47 | 1.00 | 34 | 0.80 | 23 | 1.00 | 34 |
| 3 | 1.20 | 47 | 1.00 | 34 | 1.10 | 40 | 1.00 | 34 |
| 4 | 1.10 | 40 | 1.00 | 34 | 1.10 | 40 | 0.60 | 15 |
| 5 | 1.10 | 40 | 1.20 | 47 | 1.10 | 40 | 0.60 | 15 |
| 6 | 1.10 | 40 | 1.20 | 47 | 1.10 | 40 | 0.60 | 15 |
| 7 | 1.10 | 40 | 1.20 | 47 | 1.10 | 40 | 0.60 | 15 |
| 8 | 1.10 | 40 | 1.20 | 47 | 1.10 | 40 | 0.60*a* | 15 |
| 9 | 1.10 | 40 | 1.20 | 47 | 0.60 | 15 | ..... | ..... |
| 10 | 1.20 | 47 | 1.20 | 47 | 0.70 | 18 | ..... | ..... |
| 11 | 1.20 | 47 | 1.20 | 47 | 0.70 | 18 | ..... | ..... |
| 12 | 1.20 | 47 | 1.20 | 47 | 0.70 | 18 | ..... | ..... |
| 13 | 1.20 | 47 | 1.20 | 47 | 0.70 | 18 | ..... | ..... |
| 14 | 1.20 | 47 | 1.20 | 47 | 0.70 | 18 | ..... | ..... |
| 15 | 1.20 | 47 | 1.20 | 47 | 0.70 | 18 | ..... | ..... |
| 16 | 1.20 | 47 | 1.20 | 47 | 0.70 | 18 | ..... | ..... |
| 17 | 1.20 | 47 | 1.20 | 47 | 0.70 | 18 | ..... | ..... |
| 18 | 1.20 | 47 | 1.20 | 47 | 0.70 | 18 | ..... | ..... |
| 19 | 1.20 | 47 | 1.20 | 47 | 0.70 | 18 | ..... | ..... |
| 20 | 1.20 | 47 | 1.20 | 47 | 0.70 | 18 | ..... | ..... |
| 21 | 1.20 | 47 | 1.20 | 47 | 0.70 | 18 | ..... | ..... |
| 22 | 1.20 | 47 | 1.20 | 47 | 0.70 | 18 | ..... | ..... |
| 23 | 1.20 | 47 | 1.20 | 47 | 0.70 | 18 | ..... | ..... |
| 24 | 1.20 | 47 | 1.20 | 47 | 0.70 | 18 | ..... | ..... |
| 25 | 1.20 | 47 | 1.20 | 47 | 0.70 | 18 | ..... | ..... |
| 26 | 1.20 | 47 | 1.20 | 47 | 0.70 | 18 | ..... | ..... |
| 27 | 1.20 | 47 | 1.20 | 47 | 0.70 | 18 | ..... | ..... |
| 28 | 1.20 | 47 | 1.20 | 47 | 1.00 | 34 | ..... | ..... |
| 29 | 1.20 | 47 | 1.20 | 47 | 1.00 | 34 | ..... | ..... |
| 30 | 1.20 | 47 | 1.20 | 47 | 1.00 | 34 | ..... | ..... |
| 31 | 1.20 | 47 | ..... | ..... | 1.00 | 34 | ..... | ..... |

*a* Water turned off.

MONTHLY DISCHARGE of North Branch of Canadian Pacific Railway Company Canal near Bassano, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| April (20-30) | 54 | 54 | 54 | 1,178 |
| May | 68 | 23 | 40 | 2,460 |
| June | 34 | 12 | 29 | 1,726 |
| July | 47 | 34 | 37 | 2,275 |
| August | 47 | 40 | 46 | 2,828 |
| September | 47 | 34 | 46 | 2,737 |
| October | 47 | 15 | 25 | 1,537 |
| November (1-8) | 34 | 15 | 22 | 349 |
| The period | ..... | ..... | ..... | 15,090 |

EAST BRANCH OF CANADIAN PACIFIC RAILWAY COMPANY CANAL NEAR BASSANO.

*Location.*—On SE. ¼ Sec. 3, Tp. 21, Rge. 18, W. 4th Mer., about 400 feet from headgates of East Branch and about three and one-half miles east of the Bassano dam.

*Records available.*—May 28, 1914, to December 31, 1915.

*Gauge.*—Vertical staff in stilling box. Zero of gauge is at elevation, of floor of rating flume at measuring section 87.67 feet.

*Bench-mark.*—Top of left abutment of gauging bridge. Assumed elevation, 100.00 feet.

*Channel.*—Permanent concrete channel.

*Discharge measurements.*—From gauging bridge or by wading underneath.

*Winter flow.*—Water is being run in this ditch during the winter of 1915–16 in order to fill reservoir Lake Newell.

*Artificial control.*—Discharge may be controlled by means of the headgates about 250 feet above station.

*Co-operation.*—Gauge heights supplied by the Canadian Pacific Railway Company.

*Observer.*—Superintendent of Maintenance and Operation, Canadian Pacific Railway Department of Natural Resources, Brooks, Alta.

DISCHARGE MEASUREMENTS of East Branch of Canadian Pacific Railway Company Canal near Bassano, for 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq.-ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 8 | R. J. McGuinness | 71.0 | 71.0 | 1.31 | 1.11 | 94 |
| May 28 | do | 72.2 | 90.5 | 1.19 | 1.34 | 108 |
| May 29 | do | 72.2 | 87.7 | 1.19 | 1.30 | 104 |
| July 15 | H. B. R. Thompson | 72.0 | 71.5 | 1.25 | 1.05 | 89 |
| Aug. 21 | do | 74.0 | 106.5 | 1.24 | 1.50 | 132 |
| Sept. 20 | do | 84.0 | 294.0 | 1.77 | 3.95 | 520 |
| Oct. 13 | do | 84.5 | 303.8 | 1.94 | 4.09 | 591 |
| Nov. 25 | F. K. Beach | 79.1 | 208.9 | 1.51 | 2.90 | 316 |
| Dec. 20 | do | 77.0 | 224.8 | 1.18 | 3.09 | 264 |

DAILY GAUGE HEIGHT AND DISCHARGE of East Branch of Canadian Pacific Railway Company Canal near Bassano, for 1915.

| Day. | April. | | May. | | June. | | July. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.60 | 137 | 1.20 | 96 | 1.20 | 96 |
| 2 | ..... | ..... | 1.60 | 137 | 1.20 | 96 | 1.20 | 96 |
| 3 | ..... | ..... | 1.60 | 137 | 1.20 | 96 | 1.20 | 96 |
| 4 | ..... | ..... | 1.20 | 96 | 1.20 | 96 | 1.20 | 96 |
| 5 | ..... | ..... | 1.20 | 96 | 1.20 | 96 | 1.20 | 96 |
| 6 | ..... | ..... | 1.20 | 96 | 1.20 | 96 | 1.20 | 96 |
| 7 | ..... | ..... | 1.20 | 96 | 1.20 | 96 | 1.20 | 96 |
| 8 | ..... | ..... | 1.20 | 96 | 1.20 | 96 | 1.70 | 148 |
| 9 | ..... | ..... | 1.20 | 96 | 1.20 | 96 | 1.70 | 148 |
| 10 | ..... | ..... | 1.20 | 96 | 1.20 | 96 | 1.70 | 148 |
| 11 | ..... | ..... | 1.20 | 96 | 1.20 | 96 | 1.70 | 148 |
| 12 | ..... | ..... | 2.00 | 186 | 1.20 | 96 | 1.70 | 148 |
| 13 | ..... | ..... | 1.60 | 137 | 1.20 | 96 | 1.70 | 148 |
| 14 | ..... | ..... | 1.60 | 137 | 1.20 | 96 | 1.00 | 78 |
| 15 | ..... | ..... | 1.60 | 137 | 1.20 | 96 | 1.00 | 78 |
| 16 | ..... | ..... | 1.20 | 96 | 1.20 | 96 | 1.20 | 96 |
| 17 | ..... | ..... | 1.20 | 96 | 1.20 | 96 | 1.20 | 96 |
| 18 | 1.00 | 78 | 1.20 | 96 | 1.20 | 96 | 1.20 | 96 |
| 19 | 1.50 | 126 | 1.20 | 96 | 1.20 | 96 | 1.20 | 96 |
| 20 | 2.00 | 186 | 1.20 | 96 | 1.20 | 96 | 1.30 | 106 |
| 21 | 2.40 | 244 | 1.20 | 96 | 1.20 | 96 | 1.30 | 106 |
| 22 | 2.40 | 244 | 1.20 | 96 | 1.20 | 96 | 1.30 | 106 |
| 23 | 1.00 | 78 | 1.20 | 96 | 1.20 | 96 | 1.50 | 126 |
| 24 | 2.50 | 260 | 1.20 | 96 | 1.20 | 96 | 1.50 | 126 |
| 25 | 2.50 | 260 | 1.20 | 96 | 1.20 | 96 | 1.50 | 126 |
| 26 | 2.50 | 260 | 1.20 | 96 | 1.20 | 96 | 1.40 | 116 |
| 27 | 2.00 | 186 | 1.20 | 96 | 1.20 | 96 | 1.40 | 116 |
| 28 | 1.20 | 96 | 1.20 | 96 | 1.20 | 96 | 1.50 | 126 |
| 29 | 2.50 | 260 | 1.20 | 96 | 1.20 | 96 | 1.50 | 126 |
| 30 | 1.60 | 137 | 1.20 | 96 | 1.20 | 96 | 1.50 | 126 |
| 31 | ..... | ..... | 1.20 | 96 | ..... | ..... | 1.50 | 126 |

DAILY GAUGE HEIGHT AND DISCHARGE of East Branch of Canadian Pacific Railway Company Canal near Bassano, for 1915.—*Concluded.*

| Day. | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.50 | 126 | 2.80 | 309 | 3.95 | 540 | 3.50 | 440 | 2.50 | 245 |
| 2 | 1.50 | 126 | 3.50 | 440 | 3.00 | 344 | 3.50 | 440 | 1.90 | 172 |
| 3 | 1.40 | 116 | 3.50 | 440 | 3.55 | 451 | 3.50 | 440 | 2.40 | 230 |
| 4 | 1.40 | 116 | 3.85 | 518 | 3.55 | 451 | 3.50 | 440 | 2.50 | 235 |
| 5 | 1.40 | 116 | 3.85 | 518 | 3.55 | 451 | 3.50 | 440 | 2.40 | 234 |
| 6 | 1.40 | 116 | 3.85 | 518 | 3.55 | 451 | 3.50 | 440 | 2.40 | 233 |
| 7 | 1.40 | 116 | 3.85 | 518 | 3.55 | 451 | 3.50 | 440 | 2.40 | 240 |
| 8 | 1.40 | 116 | 3.85 | 518 | 3.55 | 451 | 3.50 | 440 | 2.70 | 244 |
| 9 | 1.40 | 116 | 3.85 | 518 | 3.60 | 462 | 1.80 | 160 | 2.80 | 251 |
| 10 | 1.50 | 126 | 3.85 | 518 | 3.60 | 462 | 1.80 | 160 | 2.90 | 255 |
| 11 | 1.50 | 126 | 3.85 | 518 | 3.60 | 600 | 1.80 | 160 | 3.00 | 258 |
| 12 | 1.50 | 126 | 3.85 | 518 | 4.20 | 600 | 1.10 | 87 | 2.90 | 259 |
| 13 | 1.50 | 126 | 3.85 | 518 | 4.20 | 600 | 1.10 | 87 | 2.80 | 260 |
| 14 | 1.50 | 126 | 3.85 | 518 | 4.20 | 600 | 1.10 | 87 | 3.00 | 261 |
| 15 | 1.50 | 126 | 3.85 | 518 | 4.20 | 600 | 2.10 | 200 | 3.20 | 264 |
| 16 | 1.50 | 126 | 3.85 | 518 | 4.20 | 600 | 3.00 | 344*a* | 3.10 | 264 |
| 17 | 1.50 | 126 | 3.85 | 518 | 4.20 | 600 | 3.00 | 344 | 3.10 | 264 |
| 18 | 1.50 | 126 | 3.85 | 518 | 4.20 | 600 | 2.50 | 260 | 3.10 | 265 |
| 19 | 1.50 | 126 | 3.85 | 518 | 4.20 | 600 | 2.50 | 260 | 3.10 | 265 |
| 20 | 1.50 | 126 | 3.85 | 518 | 4.20 | 600 | 2.50 | 260 | 3.10 | 264 |
| 21 | 1.50 | 126 | 3.85 | 518 | 4.20 | 600 | 2.50 | 260 | 3.10 | 265 |
| 22 | 1.50 | 126 | 3.85 | 518 | 4.20 | 600 | 2.50 | 260 | 3.10 | 264 |
| 23 | 1.50 | 126 | 3.85 | 518 | 4.20 | 600 | 2.50 | 260 | 3.10 | 263 |
| 24 | 1.50 | 126 | 3.85 | 518 | 4.20 | 600 | 2.50 | 260 | 3.20 | 262 |
| 25 | 1.50 | 126 | 3.85 | 518 | 4.20 | 600 | 2.90 | 316 | 3.20 | 262 |
| 26 | 1.50 | 126 | 3.85 | 518 | 4.20 | 600 | 2.50 | 260 | 3.20 | 262 |
| 27 | 1.50 | 126 | 3.95 | 540 | 4.20 | 600 | 2.50 | 259 | 3.20 | 262 |
| 28 | 1.50 | 126 | 3.95 | 540 | 5.00 | 792 | 2.50 | 258 | 3.20 | 261 |
| 29 | 1.50 | 126 | 3.95 | 540 | 5.05 | 804 | 2.50 | 257 | 3.10 | 260 |
| 30 | 1.50 | 126 | 3.95 | 540 | 3.50 | 440 | 2.50 | 250 | 2.90 | 259 |
| 31 | 1.50 | 126 | ..... | ..... | 3.50 | 440 | ..... | ..... | 2.90 | 257 |

*a* Ice conditions after Nov. 15.

MONTHLY DISCHARGE of East Branch of Canadian Pacific Railway Company Canal near Bassano, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| April (18–30) | 260 | 78 | 186 | 4,795 |
| May | 186 | 96 | 107 | 6,579 |
| June | 96 | 96 | 96 | 5,712 |
| July | 148 | 78 | 114 | 7,010 |
| August | 126 | 116 | 124 | 7,624 |
| September | 540 | 309 | 509 | 30,288 |
| October | 804 | 344 | 550 | 33,818 |
| November | 440 | 87 | 286 | 17,018 |
| December | 265 | 172 | 253 | 15,556 |
| The period | ..... | ..... | ..... | 128,400 |

BOW RIVER NEAR BASSANO.

*Location.*—On SE. ¼ Sec. 2, Tp. 21, Rge. 19, W. 4th Mer., about one-half mile downstream from Canadian Pacific Railway Company's dam, and about three miles southwest of the town of Bassano.

*Records available.*—August 20, 1909, to December 31, 1915.

*Gauge.*—Vertical staff, on left bank at gauging station. Elevation of zero of gauge 2,519.43 feet during 1909–10. Elevation of zero of gauge 2,517.90 feet during 1911–12. Elevation of zero of gauge 2,513.60 feet during 1913. Elevation of zero of gauge 2,510.68 during 1914–15.

*Bench-mark.*—Permanent iron bench-mark. Elevation, 2,524.29 feet. (Canadian Pacific Railway Company's datum.)

*Channel.*—Permanent.

*Discharge measurements.*—Made from a cable.

*Winter flow.*—Records taken during winter season.

*Artificial control.*—Formed by Canadian Pacific Railway Company's dam one-half mile upstream.

*Diversions.*—Eastern Section of Canadian Pacific Railway Company's irrigation canal diverts water about one-half mile upstream.

*Co-operation.*—Gauge height supplied by Canadian Pacific Railway Company.

DISCHARGE MEASUREMENTS of Bow River near Bassano, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 7 | R. J. McGuinness | 496 | 2,056 | 0.76 | 2.79 | 1,563 |
| Jan. 19 | H. S. Kerby | 460 | 1,620 | 0.76 | 1.92 | 1,232 |
| May 7 | R. J. McGuinness | 583 | 1,648 | 2.97 | 4.00 | 4,892 |
| May 27 | do | 603 | 3,484 | 3.06 | 5.32 | 10,642 |
| June 27 | do ..... Slope | 800 | 9,531 | 6.12 | 14.70 | 69,191 |
| June 28 | do | 614 | 7,974 | 5.75 | 11.91 | 45,896 |
| June 29 | do ..... Slope | 633 | 6,166 | 6.04 | 9.79 | 37,557 |
| June 30 | do | 620 | 5,661 | 5.77 | 8.95 | 32,672 |
| July 1 | do | 620 | 5,361 | 5.73 | 8.47 | 30,720 |
| July 2 | do | 621 | 5,483 | 5.73 | 8.66 | 31,425 |
| Aug. 23 | H. B. R. Thompson | 602 | 4,011 | 3.50 | 5.96 | 14,541 |
| Sept. 18 | do | 585 | 2,378 | 1.80 | 3.66 | 4,278 |
| Oct. 21 | do | 582 | 2,108 | 1.56 | 3.23 | 3,296 |
| Nov. 24 | F. K. Beach | 485 | 1,266 | 0.506 | 1.35 | 641 |
| Dec. 20 | do | 500 | 1,601 | 0.78 | 2.04 | 1,244 |

DAILY GAUGE HEIGHT AND DISCHARGE of Bow River near Bassano, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.40*b* | 1,200 | 2.10 | 1,200 | ....*a* | ..... | ..... | ..... | 2.61 | 2,115 | 5.22 | 10,600 |
| 2 | 2.20 | 1,000 | 1.90*b* | 1,200 | ..... | ..... | ..... | ..... | 3.11 | 3,020 | 5.22 | 10,600 |
| 3 | 2.60 | 1,400 | ....*a* | ..... | ..... | ..... | ....*a* | ..... | 3.71 | 4,530 | 5.32 | 11,100 |
| 4 | 2.40 | 1,200 | ..... | ..... | ..... | ..... | 3.30 | 3,450 | 4.11 | 5,885 | 5.92 | 14,360 |
| 5 | 2.40 | 1,200 | ..... | ..... | ..... | ..... | ....*a* | ..... | 3.91 | 5,185 | 5.62 | 12,710 |
| 6 | 2.90 | 1,800 | ....*a* | ..... | ....*a* | ....*a* | ..... | ..... | 4.01 | 5,535 | 5.42 | 11,610 |
| 7 | 2.93 | 1,800 | 2.20 | 1,500 | 2.20 | 1,500 | ..... | ..... | 4.11 | 5,885 | 5.52 | 12,160 |
| 8 | 2.50 | 1,300 | ....*a* | ..... | ....*a* | ....*a* | ..... | ..... | 3.91 | 5,185 | 5.42 | 11,610 |
| 9 | 2.30 | 1,300 | ..... | ..... | ..... | ..... | ..... | ..... | 4.91 | 9,195 | 5.82 | 13,810 |
| 10 | 2.10 | 1,300 | ..... | ..... | ..... | ..... | ....*a* | ..... | 5.11 | 10,095 | 5.72 | 13,260 |
| 11 | 2.10 | 1,290 | ..... | ..... | ..... | ..... | 2.80 | 2,400 | 5.01 | 9,645 | 5.62 | 12,710 |
| 12 | 2.30 | 1,280 | ..... | ..... | ..... | ..... | ....*a* | ..... | 5.41 | 11,555 | 5.32 | 11,100 |
| 13 | 2.30 | 1,270 | ....*a* | ..... | ....*a* | ....*a* | ..... | ..... | 4.71 | 8,295 | 5.22 | 10,600 |
| 14 | 2.40 | 1,260 | 2.20 | 1,500 | 2.00 | 1,300 | ..... | ..... | 6.41 | 17,260 | 5.22 | 10,600 |
| 15 | 2.50 | 1,250 | ....*a* | ..... | ....*a* | ....*a* | ..... | ..... | 6.31 | 16,660 | 5.32 | 11,100 |
| 16 | 2.40 | 1,240 | ..... | ..... | ..... | ..... | ..... | ..... | 6.20 | 16,000 | 5.22 | 10,600 |
| 17 | 2.20 | 1,220 | ..... | ..... | ..... | ..... | ....*a* | ..... | 5.80 | 13,700 | 5.22 | 10,600 |
| 18 | 2.00 | 1,210 | ..... | ..... | ..... | ..... | 1.80 | 1,100 | 5.50 | 12,050 | 5.52 | 12,160 |
| 19 | 1.90 | 1,200 | ..... | ..... | ..... | ..... | ....*a* | ..... | 5.40 | 11,500 | 6.72 | 19,120 |
| 20 | 1.90 | 1,200 | ....*a* | ..... | ....*a* | ....*a* | ....*a* | ..... | 5.20 | 10,500 | 6.92 | 20,320 |
| 21 | 2.20 | 1,200 | 2.30 | 1,650 | 3.15 | 3,100 | 2.41 | 1,815 | 4.80 | 8,700 | 6.92 | 20,320 |
| 22 | 2.30 | 1,200 | ....*a* | ..... | ....*a* | ....*a* | 2.11 | 1,410 | 4.60 | 7,800 | 6.72 | 19,120 |
| 23 | 2.20 | 1,200 | ..... | ..... | ..... | ..... | 2.51 | 1,965 | 4.60 | 7,800 | 6.52 | 17,920 |
| 24 | 2.10 | 1,200 | ..... | ..... | ..... | ..... | 2.91 | 2,620 | 4.90 | 9,150 | 6.42 | 17,320 |
| 25 | 2.10 | 1,200 | ..... | ..... | ..... | ..... | 2.71 | 2,265 | 5.20 | 10,500 | 6.22 | 16,120 |
| 26 | 2.10 | 1,200 | ..... | ..... | ..... | ..... | 2.51 | 1,965 | 5.60 | 12,600 | 6.52 | 17,920 |
| 27 | 2.10 | 1,200 | ....*a* | ..... | ....*a* | ....*a* | 3.01 | 2,820 | 5.72 | 13,260 | 14.70 | 69,156 |
| 28 | 2.10 | 1,200 | 2.00 | 1,300 | 2.70 | 2,250 | 2.71 | 2,265 | 5.42 | 11,610 | 12.26 | 53,833 |
| 29 | 2.00 | 1,200 | ..... | ..... | ....*a* | ....*a* | 2.81 | 2,420 | 5.22 | 10,600 | 9.79 | 38,321 |
| 30 | 1.90 | 1,200 | ..... | ..... | ..... | ..... | 2.71 | 2,265 | 5.12 | 10,140 | 9.02 | 33,486 |
| 31 | 2.10 | 1,200 | ..... | ..... | ..... | ..... | ..... | ..... | 5.52 | 12,160 | ..... | ..... |

*a*–*a* Gates closed.
*b*–*b* Winter conditions.

PLATE 22

Bow River in flood at Calgary, on June 26, 1915. Looking downstream at Langevin bridge, about two hours before the maximum stage was reached. Taken by R. J. Burley.

PLATE 23

Bow River in flood at Calgary, on June 26, 1915. Looking at St. George Island Park, about two hours before the maximum stage was reached. Taken by R. J. Burley.

DAILY GAUGE HEIGHT AND DISCHARGE of Bow River near Bassano, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge | Gauge Height. | Discharge. | Gauge Height. | Discharge | Gauge Height. | Discharge |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 8.47 | 30,032 | 6.83 | 19,780 | 5.04 | 9,780 | 3.46 | 3,850 | 2.98 | 2,760 | 1.94 | 1,240 |
| 2 | 8.58 | 30,722 | 6.68 | 18,880 | 4.94 | 9,330 | ..... | .....a | 3.28 | 3,400 | 1.84 | 1,140 |
| 3 | 8.08 | 27,582 | 6.63 | 18,580 | 4.39 | 6,960 | 3.36 | 3,600 | 3.33 | 3,525 | 2.24 | 1,560 |
| 4 | 7.68 | 25,070 | 6.48 | 17,680 | 4.18 | 6,130 | 3.16 | 3,120 | 3.09 | 2,980 | 2.24 | 1,560 |
| 5 | 7.38 | 23,186 | 6.13 | 15,580 | 4.33 | 6,720 | 3.46 | 3,850 | 2.89 | 2,580 | 2.24 | 1,560 |
| 6 | 7.28 | 22,558 | 6.11 | 15,460 | 4.18 | 6,130 | 3.66 | 4,380 | 2.74 | 2,310 | 1.94 | 1,240 |
| 7 | 7.23 | 22,244 | 5.93 | 14,415 | 4.12 | 5,920 | 3.66 | 4,380 | 2.99 | 2,780 | 2.64 | 2,160 |
| 8 | 7.23 | 22,244 | 5.73 | 13,315 | 4.17 | 6,095 | 3.71 | 4,530 | 2.89 | 2,580 | 2.24 | 1,560 |
| 9 | 7.23 | 22,244 | 5.53 | 12,215 | 4.87 | 9,015 | 3.66 | 4,380 | 2.74 | 2,310 | 2.14 | 1,440 |
| 10 | 6.88 | 20,080 | 5.33 | 11,150 | 4.46 | 7,240 | 3.56 | 4,100 | 2.79 | 2,385 | 2.54 | 2,010 |
| 11 | 6.68 | 18,880 | 5.23 | 10,650 | 4.06 | 5,710 | 3.46 | 3,850 | 2.59 | 2,085 | 1.94 | 1,240 |
| 12 | 10.60 | 43,408 | 5.18 | 10,410 | 4.02 | 5,530 | 3.46 | 3,850 | 2.49 | 1,935 | 1.84 | 1,140 |
| 13 | 10.35 | 41,838 | 5.13 | 10,185 | 3.95 | 5,325 | 3.46 | 3,850 | 1.49 | 1,935 | 2.14 | 1,440 |
| 14 | 10.20 | 40,896 | 5.03 | 9,735 | 3.50 | 3,950 | 3.36 | 3,600 | 1.74 | 1,040 | 2.04 | 1,340 |
| 15 | 10.28 | 41,398 | 5.03 | 9,735 | 3.99 | 5,465 | 3.36 | 3,600 | 1.64 | 940 | 2.14 | 1,440 |
| 16 | 9.68 | 37,630 | 4.93 | 9,285 | 3.64 | 4,320 | 3.01 | 2,820 | 2.04 | 1,340 | 2.04 | 1,340 |
| 17 | 10.08 | 40,142 | 4.93 | 9,285 | 3.69 | 4,470 | 3.11 | 3,020 | 1.74 | 1,040 | 2.14 | 1,440 |
| 18 | 9.73 | 37,944 | 4.88 | 9,060 | 3.54 | 4,050 | 3.26 | 3,350 | 1.54 | 840 | 2.34 | 1,710 |
| 19 | 9.68 | 37,630 | 4.93 | 9,285 | 4.19 | 6,165 | 3.21 | 3,225 | 3.04 | 2,880 | 2.24 | 1,560 |
| 20 | 8.48 | 30,094 | 5.03 | 9,735 | 4.06 | 5,710 | 3.16 | 3,120 | 2.79 | 2,385 | 2.00 | 1,300 |
| 21 | 7.88 | 26,326 | 6.73 | 19,180 | 3.96 | 5,360 | 3.16 | 3,120 | 2.74 | 2,310 | 2.05 | 1,350 |
| 22 | 6.93 | 20,380 | 7.23 | 22,244 | 3.86 | 5,010 | 2.96 | 2,720 | 2.64 | 2,160 | 1.95 | 1,250 |
| 23 | 6.83 | 19,780 | 6.03 | 14,980 | 3.71 | 4,530 | 3.06 | 2,920 | 2.54 | 2,010 | 1.95 | 1,250 |
| 24 | 6.68 | 18,880 | 5.40 | 11,500 | 3.76 | 4,680 | 2.98 | 2,760 | 2.14 | 1,440 | 1.85 | 1,150 |
| 25 | 6.68 | 18,880 | 5.25 | 10,750 | 3.91 | 5,185 | 2.93 | 2,660 | 2.74 | 2,310 | 1.85 | 1,150 |
| 26 | 6.63 | 18,580 | 5.15 | 10,275 | 3.96 | 5,360 | 2.98 | 2,760 | 3.24 | 3,300 | 1.95 | 1,250 |
| 27 | 6.70 | 19,000 | 4.95 | 9,375 | 4.06 | 5,710 | 2.98 | 2,760 | 3.34 | 3,550 | 2.05 | 1,350 |
| 28 | 6.92 | 20,320 | 4.70 | 8,250 | 4.16 | 6,060 | ..... | .....a | 2.64 | 2,160 | 1.95 | 1,250 |
| 29 | 7.63 | 24,756 | 4.55 | 7,600 | 3.96 | 5,360 | 2.73 | 2,295 | 2.34 | 1,710 | 1.75 | 1,050 |
| 30 | 7.23 | 22,244 | 4.70 | 8,250 | 3.96 | 5,360 | 2.68 | 2,220 | 2.04 | 1,340 | 1.45 | 750 |
| 31 | 6.95 | 20,500 | 4.60 | 7,800 | ..... | ..... | 2.78 | 2,370 | ..... | ..... | 1.55 | 850 |

*a* Gates closed.

MONTHLY DISCHARGE of Bow River near Bassano, for 1915.

(Drainage area 7,613 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 1,800 | 1,000 | 1,262 | 0.1660 | 0.19 | 77,597 |
| February | 1,650 | 1,200 | 298 | 0.0391 | 0.04 | 16,550 |
| March | 3,100 | 1,300 | 263 | 0.0345 | 0.04 | 16,171 |
| April | 3,450 | 1,100 | 959 | 0.1260 | 0.14 | 57,064 |
| May | 17,260 | 2,115 | 9,617 | 1.2600 | 1.45 | 591,326 |
| June | 69,156 | 10,600 | 18,475 | 2.4300 | 2.71 | [illegible] |
| July | 43,408 | 18,580 | 27,273 | 3.5800 | 4.13 | [illegible] |
| August | 22,244 | 7,600 | 12,407 | 1.6300 | 1.88 | [illegible] |
| September | 9,780 | 3,950 | 5,888 | 0.7730 | 0.86 | [illegible] |
| October | 4,530 | 2,220 | 3,131 | 0.4110 | 0.47 | [illegible] |
| November | 3,550 | 840 | 2,211 | 0.2900 | 0.32 | [illegible] |
| December | 2,160 | 750 | 1,357 | 0.1790 | 0.21 | [illegible] |
| The year | | | | | 12.44 | [illegible] |

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Bow River drainage basin, in 1915.

| Date. | Engineer. | Stream. | Location. | Width. | Area of Section. | Mean Velocity | Discharge. |
|---|---|---|---|---|---|---|---|
| | | | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Sec.-ft.* |
| June 3.... | H. C. Ritchie..... | Beaupré Creek.... | SE. 15-26-5-5..... | 10.5 | 6.12 | 1.95 | 11.90 |
| June 18.... | do ..... | do .... | do ..... | 9.5 | 5.40 | 1.70 | 9.10 |
| Aug. 6.... | do ..... | do .... | do ..... | 16.0 | 8.50 | 1.48 | 12.50 |
| Aug. 27.... | do ..... | do .... | do ..... | 14.0 | 5.60 | 1.03 | 5.70 |
| Sept. 22.... | do ..... | do .... | do ..... | 14.0 | 5.20 | 0.93 | 4.80 |
| Oct. 28.... | do ..... | do .... | do ..... | 11.0 | 4.10 | 0.94 | 3.90 |
| June 3.... | do ..... | Bighill Creek..... | SW. 10-26-4-5..... | 12.7 | 13.30 | 3.23 | 43.00 |
| June 18.... | do ..... | do ..... | do ..... | 12.0 | 9.60 | 2.23 | 21.00 |
| Aug. 6.... | do ..... | do ..... | do ..... | 14.0 | 17.40 | 2.96 | 52.00 |
| Aug. 27.... | do ..... | do ..... | do ..... | 13.7 | 16.40 | 2.83 | 47.00 |
| Sept. 22.... | do ..... | do ..... | do ..... | 13.3 | 14.20 | 2.71 | 39.00 |
| Oct. 28.... | do ..... | do ..... | do ..... | 12.3 | 11.00 | 2.22 | 24.00 |
| Oct. 1.... | H. B. R. Thompson | C.P.R. Canal (at Syphon Antelope Coulee)..... | NW. 9-18-16-4.... | 60.6 | 244.00 | 2.47 | 603.00 |
| Aug. 7.... | H. C. Ritchie..... | Chiniki Creek..... | 2 miles E. of Morley (Ind. Reserve).. | 9.6 | 12.00 | 1.93 | 23.00 |
| Aug. 5.... | H. B. R. Thompson | FishCreek(S.Branch) | SE. 22-22-3-5..... | 22.0 | 46.40 | 2.29 | 106.00 |
| Sept. 4.... | do ..... | do ..... | do ..... | 25.0 | 17.00 | 0.99 | 16.80 |
| Oct. 2.... | do ..... | do ..... | do ..... | 32.0 | 25.60 | 1.31 | 34.00 |
| June 3.... | H. C. Ritchie..... | Grand Valley Creek | SW. 24-26-5-5..... | 22.0 | 22.70 | 2.05 | 46.00 |
| June 18.... | do ..... | do ..... | do ..... | 22.0 | 18.80 | 1.68 | 32.00 |
| Aug. 6.... | do ..... | do ..... | do ..... | 25.0 | 24.00 | 2.03 | 49.00 |
| Aug. 27.... | do ..... | do ..... | do ..... | 17.4 | 13.80 | 1.33 | 18.40 |
| Sept. 22.... | do ..... | do ..... | do ..... | 16.0 | 10.40 | 1.21 | 12.60 |
| Oct. 28.... | do ..... | do ..... | do ..... | 14.0 | 8.10 | 0.90 | 7.20 |
| June 3.... | do ..... | Horse Creek..... | NE. 8-26-4-5..... | 16.5 | 14.60 | 1.35 | 19.70 |
| June 18.... | do ..... | do ..... | do ..... | 15.4 | 13.50 | 1.28 | 17.30 |
| Aug. 6.... | do ..... | do ..... | do ..... | 18.0 | 15.00 | 1.56 | 23.00 |
| Aug. 27.... | do ..... | do ..... | do ..... | 17.5 | 13.50 | 0.99 | 13.40 |
| Sept. 22.... | do ..... | do ..... | do ..... | 17.0 | 11.40 | 0.77 | 8.80 |
| Oct. 28.... | do ..... | do ..... | do ..... | 16.0 | 8.55 | 0.56 | 4.80 |
| Jan. 11.... | do ..... | Lake Louise (Tail Race of Power House)..... | NE. 20-28-16-5... | 2.5 | 3.35 | 1.99 | 6.70 |
| Jan. 28.... | do ..... | do ..... | do .... | 2.5 | 1.90 | 0.86 | 1.64 |
| Jan. 28.... | do ..... | do ..... | do .... | 2.5 | 3.15 | 1.96 | 6.20 |
| Feb. 8.... | do ..... | do ..... | do .... | 2.5 | 1.65 | 0.67 | 1.11 |
| Feb. 24.... | do ..... | do ..... | do .... | 2.5 | 1.42 | 0.57 | 0.81 |
| Mar. 10.... | do ..... | do ..... | do .... | 2.5 | 1.42 | 0.57 | 0.81 |
| Mar. 24.... | do ..... | do ..... | do .... | 2.5 | 1.42 | 0.48 | 0.68 |
| April 22.... | O. H. Hoover..... | do ..... | do .... | 2.5 | 2.00 | 0.36 | 0.72 |
| May 13.... | H. C. Ritchie..... | do ..... | do .... | 2.5 | 4.15 | 2.11 | 8.80 |
| May 26.... | do ..... | do ..... | do .... | ..... | ..... | ..... | 12.70*a* |
| June 9.... | do ..... | do ..... | do .... | 2.5 | 4.25 | 2.09 | 8.90 |
| June 23.... | do ..... | do ..... | do .... | 2.5 | 4.25 | 2.09 | 8.90 |
| July 20.... | do ..... | do ..... | do .... | ..... | ..... | ..... | 12.20*a* |
| Aug. 18.... | do ..... | do ..... | do .... | ..... | ..... | ..... | 12.10*a* |
| Sept. 2.... | do ..... | do ..... | do .... | 8.2 | 4.10 | 1.17 | 4.80 |
| Oct. 1.... | do ..... | do ..... | do .... | ..... | ..... | ..... | 10.30*a* |
| Oct. 20.... | do ..... | do ..... | do .... | ..... | ..... | ..... | 10.10*a* |
| Nov. 2.... | do ..... | do ..... | do .... | ..... | ..... | ..... | 9.10*a* |
| Dec. 4.... | J. E. Caughey..... | do ..... | do .... | 8.4 | 2.31 | 2.00 | 4.60*a* |
| Dec. 16.... | H. C. Ritchie..... | do ..... | do .... | ..... | ..... | ..... | 6.10 |
| June 26.... | H. B. R. Thompson | Lineham Spillway.. | NW. 6-19-28-4.... | .....*b* | 161.00 | 17.79 | 2862.00 |
| Sept. 8.... | do ..... | do .... | do .... | 27.3 | 27.70 | 1.27 | 35.00 |
| Oct. 8.... | do ..... | do .... | do .... | 11.2 | 10.90 | 1.55 | 16.90 |
| Nov. 10.... | F. K. Beach..... | do .... | do .... | ..... | ..... | ..... | Nil.*c* |
| June 3.... | H. C. Ritchie..... | Spencer Creek.... | SE. 18-26-5-5..... | 10.5 | 4.22 | 1.66 | 7.00 |
| June 18.... | do ..... | do .... | do ..... | 9.4 | 3.85 | 1.72 | 6.60 |
| Aug. 6.... | do ..... | do .... | do ..... | 22.7 | 20.10 | 2.18 | 44.00 |
| Aug. 27.... | do ..... | do .... | do ..... | 20.5 | 13.80 | 1.62 | 22.00 |
| Sept. 22.... | do ..... | do .... | do ..... | 20.0 | 13.10 | 1.54 | 20.00 |
| Oct. 28.... | do ..... | do .... | do ..... | 9.4 | 8.78 | 1.14 | 10.00 |
| Jan. 15.... | do ..... | Whiteman Creek.. | NW. 24-24-11-5... | 16.0 | 19.60 | 0.31 | 6.00 |
| Jan. 23.... | do ..... | do .. | do ... | 16.0 | 19.60 | 0.32 | 6.40 |
| Feb. 6.... | do ..... | do .. | do ... | 16.2 | 20.60 | 0.32 | 6.60 |
| Feb. 25.... | do ..... | do .. | do ... | 16.0 | 20.40 | 0.32 | 6.60 |
| Mar. 12.... | do ..... | do .. | do ... | 16.0 | 20.10 | 0.28 | 5.60 |
| Mar. 26.... | do ..... | do .. | do ... | 9.7 | 11.50 | 0.52 | 6.00 |
| April 9.... | do ..... | do .. | do ... | 9.7 | 11.30 | 0.45 | 5.10 |
| April 23.... | O. H. Hoover..... | do .. | do ... | 9.7 | 11.80 | 0.53 | 6.30 |
| May 14.... | H. C. Ritchie..... | do .. | do ... | 9.9 | 12.40 | 0.55 | 6.80 |
| June 14.... | do ..... | do .. | do ... | 10.0 | 13.80 | 0.61 | 8.40 |
| Aug. 23.... | do ..... | do .. | do ... | 10.5 | 6.30 | 1.78 | 11.20 |
| Sept. 20.... | do ..... | do .. | do ... | 10.5 | 6.08 | 1.68 | 10.20 |
| Nov. 5.... | do ..... | do .. | do ... | 10.4 | 5.57 | 1.56 | 8.70 |

*a* Weir measurement.
*b* Slope measurement.
*c* No water running (pools frozen).

## LITTLE BOW RIVER DRAINAGE BASIN.

*General Description.*

The source of Little Bow River is a spring in the town of High River in Sec. 6, Tp. 19, Rge. 28, W. of the 4th Mer. From here it flows in a southeasterly direction for one hundred miles and empties into the Oldman River. In the first few miles, the natural flow is dependent entirely on a number of small springs and coulees which are dry most of the year, but later is augmented by the flow from Mosquito Creek, which drains the south and westerly part of the drainage basin.

There is a comparatively large flow in this stream during the spring freshets, but during summer it would, under natural conditions, dry up. There are a large number of ranchers and settlers on this stream and it is very important that there should be a good flow for domestic and stock watering purposes. For this reason, the Provincial Government has constructed a canal and diverts water from Highwood River into Little Bow River whenever required.

### MOSQUITO CREEK NEAR NANTON.

*Location.*—On the NE. ¼ Sec. 30, Tp. 16, Rge. 28, W. 4th Mer., about four miles from Nanton.

*Records available.*—August 1, 1908, to October 31, 1915. Discharge measurements only 1906–1908.

*Gauge.*—Vertical staff. Elevation of zero maintained at 89.22 feet during 1908–1912, and at 89.47 feet during 1913–15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Liable to shift.

*Discharge measurements.*—Made with meter from the bridge at flood stages; by wading during low water..

*Winter flow.*—Station not maintained during the winter.

*Observer.*—Wm. Monkman.

DISCHARGE MEASUREMENTS of Mosquito Creek near Nanton, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 17 | P. H. Daniells | 41 | 42.0 | 1.67 | 3.40 | 70.0 |
| April 2 | do | 18 | 10.8 | 1.02 | 2.43 | 11.1 |
| April 14 | do | 17 | 7.4 | 0.80 | 2.20 | 6.0 |
| April 28 | do | 14 | 5.4 | 0.62 | 2.03 | 3.4 |
| May 15 | W. R. McCaffrey | 50 | 61.5 | 4.02 | 3.61 | 248.0 |
| May 28 | do | 39 | 51.0 | 1.04 | 2.75 | 53.0 |
| June 12 | do | 39 | 42.0 | 1.60 | 2.86 | 67.0 |
| June 24 | do | 43 | 64.0 | 2.08 | 3.16 | 134.0 |
| July 10 | do | 56 | 63.0 | 2.82 | 3.30 | 179.0 |
| July 29 | do | 59 | 65.0 | 3.12 | 3.45 | 204.0 |
| Aug. 14 | do | 39 | 69.0 | 0.99 | 2.91 | 68.0 |
| Sept. 16 | do | 30 | 23.0 | 2.02 | 2.62 | 47.0 |
| Oct. 6 | W. H. Hannon | 32 | 24.0 | 2.20 | 2.65 | 50.0 |
| Oct. 23 | W. R. McCaffrey | 27 | 19.4 | 1.26 | 2.53 | 34.0 |

DAILY GAUGE HEIGHT AND DISCHARGE of Mosquito Creek near Nanton, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.30 | 10.0 | 2.35 | 13.0 | 2.58 | 32 |
| 2 | ..... | ..... | 2.20 | 6.0 | 2.48 | 22.0 | 2.55 | 29 |
| 3 | ..... | ..... | 2.08 | 3.6 | 2.45 | 20.0 | 2.85 | 68 |
| 4 | ..... | ..... | 2.08 | 3.6 | 2.48 | 22.0 | 3.05 | 108 |
| 5 | ..... | ..... | 2.15 | 4.9 | 2.43 | 18.4 | 3.03 | 104 |
| 6 | ..... | ..... | 2.10 | 3.8 | 2.40 | 16.0 | 3.02 | 101 |
| 7 | ..... | ..... | 2.17 | 5.3 | 2.35 | 13.0 | 3.10 | 119 |
| 8 | ..... | ..... | 2.17 | 5.3 | 2.31 | 10.6 | 3.15 | 131 |
| 9 | ..... | ..... | 2.17 | 5.3 | 2.26 | 8.4 | 2.90 | 77 |
| 10 | ..... | ..... | 2.16 | 5.1 | 2.20 | 6.0 | 2.89 | 75 |
| 11 | ..... | ..... | 2.15 | 4.9 | 2.20 | 6.0 | 2.85 | 68 |
| 12 | ..... | ..... | 2.17 | 5.3 | 2.35 | 13.0 | 2.86 | 70 |
| 13 | ..... | ..... | 2.15 | 4.9 | 2.43 | 18.4 | 2.92 | 81 |
| 14 | ..... | ..... | 2.20 | 6.0 | 3.60 | 254.0 | 2.95 | 87 |
| 15 | 3.54 | 180.0*a* | 2.17 | 5.3 | 3.61 | 257.0 | 2.98 | 93 |
| 16 | 3.56 | 205.0 | 2.18 | 5.6 | 3.50 | 224.0 | 3.00 | 97 |
| 17 | 3.61 | 215.0 | 2.15 | 4.9 | 3.42 | 202.0 | 3.02 | 101 |
| 18 | 3.56 | 220.0 | 2.20 | 6.0 | 3.35 | 182.0 | 3.43 | 204 |
| 19 | 3.51 | 227.0*a* | 2.20 | 6.0 | 3.20 | 143.0 | 3.63 | 264 |
| 20 | 3.56 | 242.0 | 2.20 | 6.0 | 3.03 | 104.0 | 3.80 | 319 |
| 21 | 3.36 | 185.0 | 2.17 | 5.3 | 3.00 | 97.0 | 4.00 | 385 |
| 22 | 3.26 | 159.0 | 2.15 | 4.9 | 2.88 | 74.0 | 3.51 | 227 |
| 23 | 2.91 | 79.0 | 2.15 | 4.9 | 2.85 | 68.0 | 3.21 | 146 |
| 24 | 2.79 | 59.0 | 2.12 | 4.2 | 2.88 | 74.0 | 3.25 | 156 |
| 25 | 2.73 | 50.0 | 2.15 | 4.9 | 2.90 | 77.0 | 3.20 | 143 |
| 26 | 2.71 | 47.0 | 2.15 | 4.9 | 2.88 | 74.0 | 7.60 | 1,573 |
| 27 | 2.70 | 46.0 | 2.12 | 4.2 | 2.85 | 68.0 | 6.80 | 1,309 |
| 28 | 2.64 | 39.0 | 2.08 | 3.6 | 2.80 | 60.0 | 5.70 | 946 |
| 29 | 2.59 | 33.0 | 2.10 | 3.8 | 2.75 | 53.0 | 3.80 | 319 |
| 30 | 2.53 | 27.0 | 2.20 | 6.0 | 2.69 | 45.0 | 3.65 | 270 |
| 31 | 2.34 | 12.4 | ..... | ..... | 2.63 | 38.0 | ..... | ..... |

*a*–*a* Estimated.

DAILY GAUGE HEIGHT AND DISCHARGE of Mosquito Creek near Nanton, for 1915.—*Concluded.*

| DAY. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.71 | 289 | 3.42 | 202 | 2.63 | 38 | 2.61 | 35 |
| 2 | 3.64 | 267 | 3.31 | 172 | 2.70 | 46 | 2.60 | 34 |
| 3 | 3.51 | 227 | 3.10 | 119 | 2.70 | 46 | 2.64 | 39 |
| 4 | 3.45 | 210 | 3.02 | 101 | 2.67 | 42 | 2.67 | 42 |
| 5 | 3.37 | 188 | 2.95 | 87 | 2.65 | 40 | 2.66 | 41 |
| 6 | 3.34 | 180 | 2.95 | 87 | 2.68 | 44 | 2.65 | 40 |
| 7 | 3.30 | 169 | 2.93 | 83 | 2.89 | 75 | 2.65 | 40 |
| 8 | 4.00 | 385 | 2.93 | 83 | 2.87 | 72 | 2.65 | 40 |
| 9 | 3.53 | 233 | 2.92 | 81 | 2.76 | 54 | 2.65 | 40 |
| 10 | 3.48 | 218 | 2.92 | 81 | 2.62 | 36 | 2.66 | 41 |
| 11 | 3.40 | 196 | 2.91 | 79 | 2.62 | 36 | 2.68 | 44 |
| 12 | 3.28 | 164 | 2.90 | 77 | 2.63 | 38 | 2.66 | 41 |
| 13 | 3.11 | 121 | 2.90 | 77 | 2.63 | 38 | 2.67 | 42 |
| 14 | 3.13 | 126 | 2.91 | 79 | 2.65 | 40 | 2.71 | 47 |
| 15 | 3.43 | 204 | 2.89 | 75 | 2.62 | 36 | 2.69 | 45 |
| 16 | 3.97 | 375 | 2.87 | 72 | 2.62 | 36 | 2.66 | 41 |
| 17 | 4.13 | 428 | 2.85 | 68 | 2.62 | 36 | 2.64 | 39 |
| 18 | 4.58 | 576 | 3.01 | 99 | 2.62 | 36 | 2.64 | 39 |
| 19 | 4.01 | 388 | 3.15 | 131 | 2.62 | 36 | 2.62 | 36 |
| 20 | 3.43 | 204 | 4.30 | 484 | 2.62 | 36 | 2.60 | 34 |
| 21 | 3.16 | 133 | 3.63 | 264 | 2.62 | 36 | 2.58 | 32 |
| 22 | 3.14 | 129 | 3.05 | 108 | 2.62 | 36 | 2.56 | 30 |
| 23 | 3.19 | 141 | 2.97 | 91 | 2.73 | 50 | 2.55 | 29 |
| 24 | 3.21 | 146 | 2.89 | 75 | 3.00 | 97 | 2.55 | 29 |
| 25 | 3.24 | 153 | 2.85 | 68 | 2.85 | 68 | 2.55 | 29 |
| 26 | 3.29 | 166 | 2.81 | 62 | 2.70 | 46 | 2.54 | 28 |
| 27 | 3.26 | 159 | 2.76 | 54 | 2.65 | 40 | 2.54 | 28 |
| 28 | 3.59 | 251 | 2.73 | 50 | 2.65 | 40 | 2.53 | 27 |
| 29 | 3.44 | 207 | 2.73 | 50 | 2.63 | 38 | 2.52 | 26 |
| 30 | 3.37 | 188 | 2.71 | 47 | 2.63 | 38 | 2.52 | 26 |
| 31 | 3.59 | 251 | 2.63 | 38 | ..... | ..... | 2.52 | 26 |

MONTHLY DISCHARGE of Mosquito Creek near Nanton, for 1915.

(Drainage area 186 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet |
| March (15-31) | 242 | 12.4 | 119.0 | 0.640 | 0.40 | 4,013 |
| April | 10 | 3.6 | 5.1 | 0.274 | 0.31 | [illegible] |
| May | 257 | 6.0 | 74.0 | 0.398 | 0.46 | 4,550 |
| June | 1,573 | 29.0 | 257.0 | 1.382 | 1.54 | 15,293 |
| July | 576 | 121.0 | 228.0 | 1.226 | 1.40 | 14,019 |
| August | 484 | 38.0 | 105.0 | 0.564 | 0.65 | 6,456 |
| September | 97 | 36.0 | 45.0 | 0.242 | 0.27 | 2,678 |
| October | 47 | 26.0 | 36.0 | 0.194 | 0.22 | 2,214 |
| The period | ..... | ..... | ..... | ..... | 5.25 | 49,526 |

NANTON CREEK NEAR NANTON.

*Location.*—On the SE. ¼ Sec. 19, Tp. 16, Rge. 28, W. 4th Mer., at highway bridge.

*Records available.*—August 3, 1908, to October 31, 1915.

*Gauge.*—Vertical staff. Zero of gauge maintained at 82.18 feet during 1908-11. Zero of gauge maintained at 82.57 feet during 1912. Zero of gauge maintained at 93.33 feet during 1913. Zero of gauge maintained at 92.31 feet during 1914-15.

*Bench-mark.*—Permanent iron bench-mark.
*Channel.*—Not liable to shift.
*Discharge measurements.*—Made upstream by wading.
*Observer.*—W. Monkman.

DISCHARGE MEASUREMENTS of Nanton Creek near Nanton, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 17 | P. H. Daniells | 13.0 | 11.6 | 0.76 | 4.28 | 8.80 |
| April 2 | do | 9.0 | 3.1 | 0.84 | 2.00 | 2.60 |
| April 14 | do | 7.5 | 2.9 | 0.84 | 1.74 | 2.40 |
| April 28 | do | 7.0 | 2.2 | 0.61 | 1.69 | 1.32 |
| May 15 | W. R. McCaffrey | 14.0 | 33.7 | 1.78 | 4.24 | 60.00 |
| May 28 | do | 11.0 | 12.2 | 1.24 | 2.56 | 15.20 |
| June 12 | do | 12.0 | 23.0 | 1.42 | 3.47 | 33.00 |
| June 24 | do | 13.0 | 28.0 | 1.50 | 3.80 | 42.00 |
| July 10 | do | 14.0 | 39.0 | 1.68 | 4.33 | 66.00 |
| July 29 | do | 19.0 | 45.0 | 1.39 | 4.35 | 68.00 |
| Aug. 14 | do | 11.0 | 18.5 | 1.36 | 2.90 | 25.00 |
| Sept. 16 | do | 12.0 | 11.8 | 1.25 | 2.50 | 14.70 |
| Oct. 6 | W. H. Hannon | 13.5 | 14.9 | 1.14 | 2.58 | 17.00 |

DAILY GAUGE HEIGHT AND DISCHARGE of Nanton Creek near Nanton, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | ..... | 11.00*b* | 1.86 | 3.5 | 2.28 | 9.8 |
| 2 | ..... | ..... | 2.00 | 5.40 | 1.88 | 3.8 | 2.98 | 24.0 |
| 3 | ..... | ..... | 1.82 | 3.00 | 1.86 | 3.5 | 4.04 | 55.0 |
| 4 | ..... | ..... | 1.80 | 2.80 | 1.84 | 3.3 | 3.68 | 43.0 |
| 5 | ..... | ..... | 1.80 | 2.80 | 1.83 | 3.2 | 3.38 | 34.0 |
| 6 | ..... | ..... | 1.76 | 2.40 | 1.80 | 2.8 | 3.12 | 28.0 |
| 7 | ..... | ..... | 1.75 | 2.30 | 1.77 | 2.5 | 3.04 | 26.0 |
| 8 | ..... | ..... | 1.75 | 2.30 | 1.74 | 2.2 | 3.13 | 28.0 |
| 9 | ..... | ..... | 1.70 | 1.80 | 1.73 | 2.1 | 3.01 | 25.0 |
| 10 | ..... | ..... | 1.70 | 1.80 | 1.74 | 2.2 | 2.90 | 22.0 |
| 11 | ..... | ..... | 1.70 | 1.80 | 1.73 | 2.1 | 2.71 | 18.0 |
| 12 | ..... | ..... | 1.70 | 1.80 | 1.72 | 2.0 | 3.47 | 37.0 |
| 13 | ..... | ..... | 1.70 | 1.80 | 1.74 | 2.2 | 2.83 | 21.0 |
| 14 | ..... | ..... | 1.70 | 1.80 | 3.99 | 53.0 | 4.13 | 58.0 |
| 15 | 4.76 | 40*a* | 1.70 | 1.80 | 4.24 | 62.0 | 3.98 | 52.0 |
| 16 | 4.50 | 46 | 1.71 | 1.90 | 4.23 | 62.0 | 3.68 | 43.0 |
| 17 | 4.45 | 52*a* | 1.71 | 1.90 | 4.03 | 54.0 | 3.38 | 34.0 |
| 18 | 4.40 | 68 | 1.71 | 1.90 | 3.63 | 41.0 | 4.43 | 70.0 |
| 19 | 4.20 | 60 | 1.71 | 1.90 | 3.33 | 33.0 | 5.83 | 125.0 |
| 20 | 3.50 | 37 | 1.71 | 1.90 | 3.18 | 29.0 | 4.73 | 81.0 |
| 21 | 3.40 | 35 | 1.72 | 2.00 | 3.03 | 25.0 | 4.03 | 54.0 |
| 22 | 3.30 | 32 | 1.72 | 2.00 | 2.78 | 20.0 | 3.95 | 52.0 |
| 23 | 3.20 | 30 | 1.71 | 1.90 | 2.72 | 18.0 | 3.88 | 49.0 |
| 24 | 3.05 | 26 | 1.71 | 1.90 | 2.70 | 18.0 | 3.80 | 46.0 |
| 25 | 2.96 | 24 | 1.72 | 2.00 | 3.03 | 25.0 | 3.63 | 41.0 |
| 26 | 2.87 | 22 | 1.72 | 2.00 | 2.93 | 23.0 | 7.92 | 209.0 |
| 27 | 2.87 | 22 | 1.71 | 1.90 | 2.75 | 19.0 | 6.73 | 161.0 |
| 28 | 2.85 | 21 | 1.72 | 2.00 | 2.68 | 17.6 | 5.73 | 121.0 |
| 29 | 2.82 | 21 | 1.74 | 2.20 | 2.56 | 15.1 | 5.38 | 107.0 |
| 30 | ..... | 20*b* | 1.82 | 3.00 | 2.45 | 12.9 | 5.18 | 99.0 |
| 31 | ..... | 20 | ..... | ..... | 2.33 | 10.6 | ..... | ..... |

*a* to *a* Estimated.
*b* to *b* Estimated.

DAILY GAUGE HEIGHT AND DISCHARGE of Nanton Creek near Nanton, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 5.43 | 109 | 3.73 | 44.0 | 2.63 | 16.5 | 2.42 | 12.3 |
| 2 | 5.18 | 99 | 3.64 | 42.0 | 2.63 | 16.5 | 2.42 | 12.3 |
| 3 | 5.01 | 93 | 3.48 | 37.0 | 2.61 | 16.1 | 2.49 | 13.7 |
| 4 | 4.82 | 85 | 3.36 | 34.0 | 2.61 | 16.1 | 2.53 | 14.5 |
| 5 | 4.71 | 81 | 3.26 | 31.0 | 2.61 | 16.1 | 2.49 | 13.7 |
| 6 | 4.60 | 76 | 3.26 | 31.0 | 2.59 | 15.7 | 2.49 | 13.7 |
| 7 | 5.05 | 94 | 3.23 | 30.0 | 2.78 | 19.7 | 2.48 | 13.5 |
| 8 | 5.35 | 106 | 3.21 | 30.0 | 2.73 | 18.6 | 2.47 | 13.3 |
| 9 | 4.98 | 91 | 3.08 | 27.0 | 2.64 | 16.7 | 2.49 | 13.7 |
| 10 | 4.13 | 58 | 2.98 | 24.0 | 2.56 | 15.1 | 2.51 | 14.1 |
| 11 | 3.85 | 48 | 2.92 | 23.0 | 2.51 | 14.1 | 2.49 | 13.7 |
| 12 | 3.83 | 47 | 2.88 | 22.0 | 2.52 | 14.3 | 2.49 | 13.7 |
| 13 | 3.93 | 51 | 2.83 | 21.0 | 2.51 | 14.1 | 2.53 | 14.5 |
| 14 | 4.04 | 55 | 2.87 | 22.0 | 2.51 | 14.1 | 2.58 | 15.5 |
| 15 | 4.26 | 63 | 2.84 | 21.0 | 2.50 | 13.9 | 2.52 | 14.3 |
| 16 | 4.93 | 89 | 2.82 | 21.0 | 2.50 | 13.9 | 2.48 | 13.5 |
| 17 | 5.04 | 94 | 2.93 | 23.0 | 2.49 | 13.7 | 2.46 | 13.1 |
| 18 | 4.33 | 66 | 2.98 | 24.0 | 2.48 | 13.5 | 2.45 | 12.9 |
| 19 | 4.01 | 54 | 3.04 | 26.0 | 2.48 | 13.5 | 2.46 | 13.1 |
| 20 | 3.74 | 45 | 6.03 | 133.0 | 2.46 | 13.1 | 2.45 | 12.9 |
| 21 | 3.48 | 37 | 4.03 | 54.0 | 2.45 | 12.9 | 2.44 | 12.7 |
| 22 | 3.53 | 38 | 3.13 | 28.0 | 2.45 | 12.9 | 2.42 | 12.3 |
| 23 | 4.23 | 62 | 2.93 | 23.0 | 2.83 | 21.0 | 2.35 | 11.0 |
| 24 | 4.24 | 62 | 2.92 | 23.0 | 3.37 | 34.0 | 2.35 | 11.0 |
| 25 | 4.18 | 60 | 2.88 | 22.0 | 3.03 | 25.0 | 2.34 | 10.8 |
| 26 | 3.78 | 46 | 2.83 | 21.0 | 2.85 | 21.0 | 2.34 | 10.8 |
| 27 | 3.72 | 44 | 2.79 | 20.0 | 2.69 | 17.8 | 2.32 | 10.5 |
| 28 | 4.88 | 87 | 2.73 | 19.0 | 2.54 | 14.7 | 2.30 | 10.1 |
| 29 | 4.38 | 68 | 2.71 | 18.0 | 2.50 | 13.9 | 2.29 | 9.9 |
| 30 | 4.03 | 54 | 2.67 | 17.3 | 2.44 | 12.7 | 2.28 | 9.8 |
| 31 | 3.63 | 41 | 2.64 | 16.7 | ..... | ..... | 2.27 | 9.6 |

MONTHLY DISCHARGE of Nanton Creek near Nanton, for 1915.

(Drainage area 46 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (15-31) | 68.0 | 20.00 | 34.0 | 0.739 | 0.47 | 1,146 |
| April | 11.0 | 1.80 | 2.5 | 0.054 | 0.06 | 149 |
| May | 62.0 | 2.00 | 18.5 | 0.402 | 0.46 | 1,138 |
| June | 209.0 | 9.80 | 5.9 | 1.283 | 1.43 | 3,511 |
| July | 109.0 | 37.00 | 68.0 | 1.478 | 1.70 | 4,181 |
| August | 133.0 | 16.70 | 30.0 | 0.652 | 0.75 | 1,845 |
| September | 34.0 | 12.70 | 16.4 | 0.357 | 0.40 | 976 |
| October | 15.5 | 9.60 | 12.6 | 0.274 | 0.32 | 775 |
| The period | ..... | ..... | ..... | | 5.59 | 13,721 |

## OLDMAN RIVER DRAINAGE BASIN.

*General Description.*

The Oldman River is the largest of the two streams which on their junction form the South Saskatchewan River.

The main river is formed between the Rocky Mountains and Livingstone Range by the junction of Livingstone River, Northwest Branch, West Branch and Racehorse Creek. It first flows southeasterly until joined by the Crowsnest and Castle Rivers and then flows in a general eastern direction to its junction with the Bow River. There are a number of small tributaries joining the main stream and two large ones, the Belly River and the St. Mary River. These two streams empty into the river between Macleod and Lethbridge, and full descriptions of their basins are given elsewhere in this report.

The territory drained by this stream consists of mountains, foothills and prairie. The mountain region is quite extensive and is divided into the main range and the Livingstone Range of the Rocky Mountains. There is a good forest cover on many parts of the mountains and foothills, but much of the Livingstone Range and some parts of the Rockies are precipitous and bare of tree growth. On the higher peaks a considerable amount of snow collects and thus the streams are subject to high water caused by melting snows during the heat of the summer and in the early spring.

Floods of exceptional magnitude only occur after exceptionally heavy rains.

The precipitation throughout this basin varies greatly. It is heaviest in the mountains and decreases rapidly towards the eastern edge of the basin where it is rather small. There are no irrigation projects of any size on the main river, although extensive surveys have been carried on with the object of irrigating a large area lying between the main river and the Little Bow River, the water to be diverted west of Macleod. On the smaller tributaries a number of irrigation schemes are now in operation.

A special report upon the floods in this drainage basin is given in Appendix No. 4 of this report.

### SUMMIT CREEK AT CROWSNEST.

*Location.*—On the SE. ¼ Sec. 12, Tp. 8, Rge. 6, W. 5th Mer., about 1,000 feet upstream from Canadian Pacific Railway Company's concrete dam.

*Records available.*—Discharge measurements only are available from February 21, 1912, to October 16, 1915.

*Gauge.*—Vertical staff, nailed to a tree on the right bank.

*Bench-mark.*—Is a spruce stump on the right bank about 30 feet downstream from the gauge. The elevation is 5.94 feet above the zero of the gauge.

*Channel.*—Fairly permanent with a bed of fine gravel.

*Discharge measurements.*—Are made by wading in high water and by means of a 24-inch weir in low stages.

*Winter flow.*—Discharge measurements are continued throughout the winter.

*Observer.*—No gauge height records are obtained at this station.

DISCHARGE MEASUREMENTS of Summit Creek at Crowsnest, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 22 | J. E. Caughey | ..... | ..... | ..... | ..... | 0.446*a* |
| Feb. 23 | F. R. Steinberger | ..... | ..... | ..... | 1.57 | 0.189*a* |
| Mar. 10 | P. H. Daniells | ..... | ..... | ..... | 1.54 | 0.123*a* |
| Mar. 22 | do | ..... | ..... | ..... | ..... | 0.189*a* |
| April 6 | do | ..... | ..... | ..... | 1.79 | 1.018*a* |
| April 20 | do | 5.0 | 1.75 | 1.97 | 2.02 | 3.400 |
| May 3 | do | 7.0 | 4.10 | 2.18 | 2.20 | 8.000 |
| May 18 | W. R. McCaffrey | 9.0 | 5.30 | 2.58 | 2.29 | 13.600 |
| June 2 | do | 5.5 | 2.55 | 1.40 | 1.97 | 3.600 |
| June 30 | do | 6.5 | 2.85 | 1.40 | 1.99 | 4.000 |
| July 16 | do | 5.0 | 1.80 | 1.17 | 1.81 | 2.100 |
| Aug. 5 | do | 6.0 | 2.50 | 1.29 | 1.87 | 3.230 |
| Sept. 10 | do | ..... | ..... | ..... | 1.61 | 0.173*a* |
| Sept. 25 | do | ..... | ..... | ..... | 1.63 | 0.255*a* |
| Oct. 16 | do | ..... | ..... | ..... | 1.72 | 0.420*a* |

*a* Weir measurement.

CROWSNEST RIVER NEAR COLEMAN.

*Location.*—On SW. ¼ Sec. 12, Tp. 8, Rge. 5, W. 5th Mer., near Prudent le Gal's house.

*Records available.*—June 13, 1910, to December 31, 1915.

*Gauge.*—Vertical staff. Zero maintained at elevation of 92.12 feet during 1910–12. Zero maintained at elevation of 92.73 feet during 1913–15.

*Bench-mark.*—Permanent iron bench-mark, located on left bank at the station. Assumed elevation, 100.00 feet.

*Channel.*—Composed of gravel and slightly shifting.

*Discharge measurements.*—Made from a wooden bridge during high water and by wading during low stages at a point about one mile below the gauge.

*Winter flow.*—Discharge measurements continued during the winter season.

*Observer.*—Prudent le Gal.

DISCHARGE MEASUREMENTS of Crowsnest River near Coleman, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 21 | J. E. Caughey | 29 | 27.3 | 1.57 | 1.46 | 43.0 |
| Feb. 6 | F. R. Steinberger | 28 | 24.0 | 1.44 | 1.49 | 34.0 |
| Feb. 22 | do | 30 | 24.0 | 1.33 | 1.32 | 32.0 |
| Mar. 9 | P. H. Daniells | 30 | 24.0 | 1.35 | 1.27 | 33.0 |
| Mar. 23 | do | 34 | 27.0 | 1.44 | 1.34 | 39.0 |
| April 6 | do | 33 | 29.0 | 1.62 | 1.43 | 47.0 |
| April 17 | do | 36 | 38.0 | 2.16 | 1.86 | 72.0a |
| May 4 | do | 55 | 71.0 | 3.65 | 2.76 | 210.0a |
| May 18 | W. R. McCaffrey | 55 | 72.0 | 3.82 | 2.83 | 222.0a |
| May 31 | do | 52 | 70.0 | 3.40 | 2.76 | 212.0a |
| June 15 | do | 55 | 105.0 | 2.42 | 3.01 | 254.0 |
| June 30 | do | 31 | 72.0 | 3.89 | 3.18 | 281.0b |
| July 16 | do | 44 | 51.0 | 3.41 | 2.52 | 175.0 |
| Aug. 3 | do | 30 | 58.0 | 3.11 | 2.59 | 182.0 |
| Aug. 16 | do | 29 | 46.0 | 2.48 | 2.16 | 115.0 |
| Sept. 9 | do | 28 | 42.0 | 1.80 | 1.87 | 75.0 |
| Sept. 24 | do | 29 | 43.0 | 1.91 | 1.92 | 85.0 |
| Oct. 18 | do | 26 | 37.0 | 1.68 | 1.72 | 63.0 |
| Oct. 29 | do | 26 | 38.0 | 1.61 | 1.72 | 61.0 |
| Nov. 13 | do | 29 | 56.2 | 1.64 | 2.63 | 92.0 |
| Nov. 27 | do | 30 | 28.8 | 1.82 | 1.63 | 49.0 |
| Dec. 10 | do | 31 | 24.6 | 2.06 | 1.66 | 51.0 |
| Dec. 27 | do | 33 | 28.9 | 1.55 | 2.65 | 45.0 |

*a* Discharges adjusted to allow for small tributaries entering river between gauge and measurement section

*b* New measurement section located 200 ft. below gauge.

DAILY GAUGE HEIGHT AND DISCHARGE of Crowsnest River near Coleman, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.75 | 54 | 1.74 | 31 | 1.24 | 31 | 1.39 | 40 | 2.73 | 203 | 2.96 | 245 |
| 2 | 1.68 | 54 | 1.58 | 32 | 1.24 | 32 | 1.44 | 43 | 3.05 | 261 | 2.96 | 245 |
| 3 | 1.60 | 52 | 1.57 | 33 | 1.29 | 33 | 1.47 | 45 | 3.15 | 279 | 2.96 | 245 |
| 4 | 1.82 | 52 | 1.56 | 34 | 1.29 | 33 | 1.49 | 46 | 2.73 | 203 | 2.96 | 245 |
| 5 | 1.93 | 51 | 1.82 | 34 | 1.26 | 33 | 1.51 | 48 | 2.60 | 182 | 2.94 | 241 |
| 6 | 1.84 | 50 | 1.67 | 34 | 1.24 | 33 | 1.51 | 48 | 2.60 | 182 | 2.96 | 245 |
| 7 | 1.75 | 50 | 1.56 | 34 | 1.24 | 33 | 1.52 | 48 | 2.72 | 202 | 3.01 | 254 |
| 8 | 1.75 | 50 | 1.28 | 34 | 1.29 | 33 | 1.50 | 47 | 3.03 | 257 | 2.96 | 245 |
| 9 | 1.75 | 50 | 1.26 | 34 | 1.30 | 33 | 1.49 | 46 | 3.27 | 301 | 2.91 | 236 |
| 10 | 1.73 | 49 | 1.29 | 36 | 1.33 | 37 | 1.49 | 46 | 3.62 | 366 | 2.91 | 236 |
| 11 | 1.72 | 49 | 1.29 | 37 | 1.33 | 37 | 1.48 | 45 | 3.25 | 297 | 2.96 | 245 |
| 12 | 1.70 | 48 | 1.41 | 37 | 1.33 | 37 | 1.50 | 47 | 3.05 | 261 | 2.91 | 236 |
| 13 | 1.62 | 48 | 1.67 | 36 | 1.31 | 36 | 1.52 | 48 | 3.05 | 261 | 2.73 | 203 |
| 14 | 1.58 | 48 | 1.78 | 35 | 1.31 | 36 | 1.67 | 59 | 3.00 | 252 | 2.96 | 245 |
| 15 | 1.58 | 47 | 1.82 | 34 | 1.32 | 37 | 1.71 | 62 | 2.87 | 229 | 3.01 | 254 |
| 16 | 2.04 | 47 | 1.88 | 32 | 1.32 | 37 | 1.86 | 75 | 2.83 | 221 | 3.06 | 263 |
| 17 | 2.50 | 46 | 1.88 | 31 | 1.30 | 36 | 1.87 | 76 | 2.85 | 225 | 3.11 | 272 |
| 18 | 3.70 | 45 | 1.26 | 30 | 1.30 | 36 | 1.95 | 85 | 2.84 | 223 | 3.05 | 261 |
| 19 | 2.64 | 45 | 1.26 | 29 | 1.30 | 36 | 2.20 | 118 | 2.85 | 225 | 3.05 | 261 |
| 20 | 1.52 | 44 | 1.25 | 29 | 1.35 | 38 | 2.23 | 123 | 2.90 | 234 | 3.01 | 254 |
| 21 | 1.57 | 43 | 1.24 | 30 | 1.35 | 38 | 2.25 | 126 | 2.70 | 198 | 2.97 | 247 |
| 22 | 2.75 | 42 | 1.29 | 32 | 1.35 | 38 | 2.25 | 126 | 2.70 | 198 | 3.01 | 254 |
| 23 | 2.56 | 41 | 1.29 | 33 | 1.34 | 38 | 2.25 | 126 | 2.70 | 198 | 3.01 | 254 |
| 24 | 2.45 | 40 | 1.29 | 33 | 1.39 | 40 | 2.16 | 112 | 2.90 | 234 | 3.01 | 254 |
| 25 | 2.95 | 38 | 1.26 | 33 | 1.61 | 53 | 2.12 | 107 | 2.86 | 227 | 3.11 | 272 |
| 26 | 2.57 | 36 | 1.26 | 33 | 1.89 | 78 | 2.13 | 108 | 2.90 | 234 | 3.26 | 299 |
| 27 | 2.25 | 33 | 1.24 | 32 | 1.51 | 48 | 1.96 | 86 | 2.90 | 234 | 3.31 | 308 |
| 28 | 2.10 | 31 | 1.24 | 31 | 1.29 | 36 | 1.95 | 85 | 3.02 | 256 | 3.11 | 272 |
| 29 | 1.85 | 30 | ..... | ..... | 1.24 | 34 | 1.98 | 89 | 3.02 | 256 | 3.11 | 272 |
| 30 | 1.85 | 30 | ..... | ..... | 1.34 | 38 | 2.30 | 134 | 3.02 | 256 | 3.38 | 320 |
| 31 | 1.85 | 30 | ..... | ..... | 1.36 | 39 | ..... | ..... | 2.96 | 245 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Crowsnest River near Coleman, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.21 | 290 | 2.68 | 195 | 1.95 | 85 | 1.87 | 76 | 1.75 | 65 | 1.58 | 49 |
| 2 | 3.19 | 286 | 2.68 | 195 | 1.90 | 79 | 1.89 | 78 | 1.75 | 65 | 1.58 | 50 |
| 3 | 3.16 | 281 | 2.64 | 188 | 1.88 | 77 | 1.90 | 79 | 1.75 | 65 | 1.58 | 50 |
| 4 | 3.11 | 272 | 2.58 | 179 | 1.85 | 74 | 1.97 | 87 | 1.74 | 64 | 1.75 | 49 |
| 5 | 3.10 | 270 | 2.46 | 160 | 1.85 | 74 | 1.99 | 90 | 1.75 | 65 | 1.65 | 49 |
| 6 | 3.08 | 266 | 2.46 | 160 | 1.85 | 74 | 1.95 | 85 | 1.76 | 66 | 1.60 | 49 |
| 7 | 3.06 | 263 | 2.42 | 153 | 1.85 | 74 | 1.92 | 81 | 1.75 | 65 | 1.60 | 49 |
| 8 | 3.06 | 263 | 2.42 | 153 | 1.82 | 71 | 1.90 | 79 | 1.75 | 65 | 1.62 | 50 |
| 9 | 2.96 | 245 | 2.39 | 148 | 1.87 | 76 | 1.87 | 76 | 1.75 | 65 | 1.76 | 51 |
| 10 | 2.84 | 223 | 2.35 | 142 | 1.83 | 72 | 1.85 | 74 | 1.75 | 65 | 1.66 | 51 |
| 11 | 2.81 | 218 | 2.32 | 137 | 1.80 | 69 | 1.81 | 70 | 1.75 | 65 | 1.63 | 51 |
| 12 | 2.79 | 214 | 2.30 | 134 | 1.78 | 67 | 1.80 | 69 | 1.80 | 71 | 1.63 | 50 |
| 13 | 2.76 | 209 | 2.30 | 134 | 1.78 | 67 | 1.78 | 67 | 2.63 | 92 | 1.69 | 49 |
| 14 | 2.74 | 205 | 2.28 | 131 | 1.78 | 67 | 1.75 | 65 | 2.10 | 97 | 1.65 | 48 |
| 15 | 2.68 | 195 | 2.26 | 128 | 1.75 | 65 | 1.75 | 65 | 1.85 | 73 | 1.53 | 46 |
| 16 | 2.60 | 182 | 2.16 | 112 | 1.75 | 65 | 1.75 | 65 | 1.75 | 65 | 1.54 | 43 |
| 17 | 2.53 | 171 | 2.14 | 110 | 1.75 | 65 | 1.73 | 63 | 1.75 | 64 | 1.45 | 42 |
| 18 | 2.55 | 174 | 2.12 | 107 | 1.75 | 65 | 1.74 | 64 | 1.72 | 62 | 1.72 | 41 |
| 19 | 2.65 | 190 | 2.12 | 107 | 1.79 | 68 | 1.74 | 64 | 1.71 | 60 | 1.46 | 40 |
| 20 | 2.68 | 195 | 2.10 | 104 | 1.79 | 68 | 1.75 | 65 | 2.10 | 65 | 1.37 | 40 |
| 21 | 2.60 | 182 | 2.10 | 104 | 1.79 | 68 | 1.75 | 65 | 2.10 | 74 | 1.45 | 42 |
| 22 | 2.58 | 179 | 2.06 | 98 | 1.79 | 68 | 1.75 | 65 | 2.10 | 72 | 1.44 | 44 |
| 23 | 2.55 | 174 | 2.04 | 96 | 1.80 | 69 | 1.75 | 65 | 1.60 | 52 | 1.51 | 46 |
| 24 | 2.55 | 174 | 2.04 | 96 | 1.90 | 79 | 1.75 | 65 | 1.60 | 49 | 1.92 | 46 |
| 25 | 2.55 | 174 | 2.02 | 93 | 1.88 | 77 | 1.75 | 65 | 1.55 | 49 | 1.53 | 46 |
| 26 | 2.50 | 166 | 2.02 | 93 | 1.85 | 74 | 1.75 | 65 | 1.67 | 50 | 1.88 | 45 |
| 27 | 2.44 | 156 | 2.02 | 93 | 1.83 | 72 | 1.75 | 65 | 1.63 | 49 | 2.65 | 45 |
| 28 | 2.66 | 192 | 1.98 | 89 | 1.80 | 69 | 1.73 | 63 | 1.65 | 48 | 2.86 | 45 |
| 29 | 2.89 | 232 | 1.95 | 85 | 1.83 | 72 | 1.72 | 63 | 1.67 | 48 | 2.80 | 43 |
| 30 | 2.74 | 205 | 1.95 | 85 | 1.85 | 74 | 1.74 | 64 | 1.60 | 48 | 2.68 | 41 |
| 31 | 2.70 | 198 | 1.95 | 85 | ..... | ..... | 1.75 | 65 | ..... | ..... | 1.95 | 40 |

MONTHLY DISCHARGE of Crowsnest River near Coleman, for 1915.

(Drainage area 70 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 54 | 30 | 44 | 0.628 | 0.72 | 2,705 |
| February | 37 | 29 | 33 | 0.471 | 0.49 | 1,832 |
| March | 78 | 31 | 38 | 0.543 | 0.63 | 2,336 |
| April | 134 | 40 | 76 | 1.086 | 1.21 | 4,522 |
| May | 366 | 182 | 239 | 3.414 | 3.93 | 14,696 |
| June | 320 | 203 | 256 | 3.657 | 4.08 | 15,233 |
| July | 290 | 156 | 214 | 3.057 | 3.52 | 13,158 |
| August | 195 | 85 | 126 | 1.800 | 2.08 | 7,747 |
| September | 85 | 65 | 71 | 1.014 | 1.13 | 4,225 |
| October | 90 | 63 | 70 | 1.000 | 1.15 | 4,304 |
| November | 97 | 48 | 63 | 0.900 | 1.04 | 3,749 |
| December | 51 | 40 | 46 | 0.657 | 0.76 | 2,828 |
| The year | ..... | ..... | ..... | ..... | 20.74 | 77,335 |

MCGILLIVRAY CREEK NEAR COLEMAN.

*Location.*—On SE. ¼ of Sec. 7, Tp. 8, Rge. 4, W. 5th Mer., about 150 feet north of Canadian Pacific Railway Company's culvert across the creek.

*Records available.*—Jan. 9, 1913, to June 15, 1915.

*Gauge.*—Vertical staff.

*Bench-mark.*—Stump on left bank about fifty feet downstream from the gauge. Elevation, 2.99 feet above zero of the gauge.

*Channel.*—Gravel and slightly shifting.

*Discharge measurements.*—Made by wading during low stages and from a foot-bridge, during high water.

*Winter-flow.*—Discharge measurements only made during the winter season.

*Observer.*—Mrs. H. G. Perdue.

*Remarks.*—This station was discontinued June 15, 1915, as daily records were not considered of sufficient value to warrant expense of maintenance.

DISCHARGE MEASUREMENTS of McGillivray Creek near Coleman, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 23 | P. H. Daniells | 10 | 6.0 | 0.99 | 1.27 | 5.9 |
| April 6 | do | 11 | 9.2 | 1.00 | 1.40 | 9.4 |
| April 17 | do | 14 | 11.6 | 2.00 | 1.64 | 23.0 |
| May 4 | do | 14 | 15.6 | 2.44 | 1.80 | 38.0 |
| May 18 | W. R. McCaffrey | 16 | 15.6 | 2.62 | 1.73 | 40.0 |
| May 31 | do | 14 | 12.9 | 2.22 | 1.63 | 29.0 |
| June 30 | do | 14 | 15.0 | 3.19 | 1.83 | 48.0 |
| July 16 | do | 13 | 9.2 | 1.84 | 1.50 | 17.0 |
| Aug. 3 | do | 12 | 7.6 | 1.58 | 1.44 | 12.0 |
| Aug. 16 | do | 13 | 8.0 | 0.83 | 1.32 | 6.6 |
| Sept. 9 | do | 10 | 6.2 | 0.83 | 1.25 | 5.1 |
| Sept. 24 | do | 11 | 6.4 | 0.91 | 1.27 | 5.8 |
| Oct. 18 | do | 11 | 6.4 | 0.81 | 1.30 | 5.2 |
| Dec. 10 | do | 9 | 6.9 | 0.56 | 1.34 | 3.9 |

DAILY GAUGE HEIGHT AND DISCHARGE of McGillivray Creek near Coleman, for 1915.

| Day. | April. | | May. | | June. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.83 | 47 | 1.65 | 28.0 |
| 2 | ..... | ..... | 2.03 | 71 | 1.63 | 26.0 |
| 3 | ..... | ..... | 1.87 | 51 | 1.63 | 26.0 |
| 4 | ..... | ..... | 1.83 | 47 | 1.63 | 26.0 |
| 5 | ..... | ..... | 1.83 | 47 | 1.61 | 24.0 |
| 6 | ..... | ..... | 1.84 | 48 | 1.59 | 22.0 |
| 7 | ..... | ..... | 1.84 | 48 | 1.59 | 22.0 |
| 8 | ..... | ..... | 1.87 | 51 | 1.57 | 21.0 |
| 9 | ..... | ..... | 1.92 | 57 | 1.57 | 21.0 |
| 10 | ..... | ..... | 1.93 | 59 | 1.54 | 18.5 |
| 11 | 1.60 | 23.0 | 1.84 | 48 | 1.54 | 18.5 |
| 12 | 1.60 | 23.0 | 1.92 | 57 | 1.54 | 18.5 |
| 13 | 1.60 | 23.0 | 1.92 | 57 | 1.57 | 21.0 |
| 14 | 1.61 | 24.0 | 1.93 | 59 | 1.77 | 40.0 |
| 15 | 1.61 | 24.0 | 1.93 | 59 | 1.81 | 44.0 |
| 16 | 1.61 | 24.0 | 1.85 | 49 | ..... | .....[a] |
| 17 | 1.61 | 24.0 | 1.85 | 49 | ..... | ..... |
| 18 | 1.62 | 25.0 | 1.85 | 49 | ..... | ..... |
| 19 | 1.64 | 27.0 | 1.83 | 47 | ..... | ..... |
| 20 | 1.65 | 27.0 | 1.83 | 47 | ..... | ..... |
| 21 | 1.65 | 27.0 | 1.83 | 47 | ..... | ..... |
| 22 | 1.58 | 22.0 | 1.81 | 44 | ..... | ..... |
| 23 | 1.55 | 19.3 | 1.80 | 43 | ..... | ..... |
| 24 | 1.53 | 17.8 | 1.74 | 36 | ..... | ..... |
| 25 | 1.50 | 15.5 | 1.72 | 34 | ..... | ..... |
| 26 | 1.50 | 15.5 | 1.70 | 32 | ..... | ..... |
| 27 | 1.51 | 16.2 | 1.70 | 32 | ..... | ..... |
| 28 | 1.51 | 16.2 | 1.70 | 32 | ..... | ..... |
| 29 | 1.56 | 20.0 | 1.70 | 32 | ..... | ..... |
| 30 | 1.83 | 47.0 | 1.70 | 32 | ..... | ..... |
| 31 | ..... | ..... | 1.65 | 28 | ..... | ..... |

*a* Station discontinued.

MONTHLY DISCHARGE of McGillivray Creek near Coleman, for 1915.

(Drainage area 16 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| April (11–30) | 47 | 15.5 | 23 | 1.438 | 1.07 | 912 |
| May | 71 | 28.0 | 46 | 2.875 | 3.31 | 2,828 |
| June (1–15) | 44 | 18.5 | 25 | 1.562 | 0.87 | 744 |
| The period | ..... | ..... | ..... | ..... | 5.25 | 5,484 |

CROWSNEST RIVER NEAR FRANK.

*Location.*—On the NE. ¼ Sec. 36, Tp. 7, Rge. 4, W. 5th Mer., at the traffic bridge.

*Records available.*—June 13, 1910, to December 31, 1915.

*Gauge.*—Vertical staff.

*Bench-mark.*—A stump on the left bank about four feet from the gauge. Elevation 9.43 feet above the zero of the gauge.

*Channel.*—Gravel and fairly permanent.

*Discharge measurements.*—Made from traffic bridge during high water and by wading in low stages.

*Winter flow.*—Discharge measurements are continued during the winter season.

*Observer.*—I. Wilson.

DISCHARGE MEASUREMENTS of Crowsnest River near Frank, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 19 | J. E. Caughey | 49 | 49 | 1.31 | 4.14 | 64.0 |
| Feb. 8 | F. R. Steinberger | 48 | 45 | 1.23 | 4.12 | 55.0 |
| Feb. 22 | do | 49 | 42 | 1.18 | 4.05 | 50.0 |
| Mar. 9 | P. H. Daniells | 49 | 38 | 1.18 | 4.00 | 44.0 |
| Mar. 24 | do | 50 | 51 | 1.34 | 4.18 | 68.0 |
| April 7 | do | 60 | 74 | 2.12 | 4.51 | 157.0 |
| April 19 | do | 68 | 113 | 2.98 | 5.06 | 336.0 |
| May 5 | do | 70 | 137 | 4.18 | 5.70 | 572.0 |
| May 17 | W. R. McCaffrey | 71 | 137 | 3.89 | 5.65 | 532.0 |
| June 1 | do | 68 | 120 | 3.65 | 5.32 | 438.0 |
| June 16 | do | 67 | 139 | 3.75 | 5.54 | 521.0 |
| June 26 | do | 67 | 161 | 4.66 | 5.97 | 751.0 |
| July 17 | do | 66 | 92 | 3.06 | 4.86 | 282.0 |
| Aug. 3 | do | 66 | 95 | 2.88 | 4.86 | 273.0 |
| Aug. 17 | do | 65 | 74 | 2.11 | 4.55 | 156.0 |
| Sept. 10 | do | 61 | 58 | 1.63 | 4.35 | 94.0 |
| Sept. 25 | do | 63 | 62 | 1.84 | 4.41 | 114.0 |
| Oct. 16 | do | 54 | 54 | 1.69 | 4.34 | 90.0 |
| Oct. 30 | do | 65 | 64 | 1.79 | 4.45 | 115.0 |
| Nov. 12 | do | 52 | 49 | 1.50 | 4.23 | 74.0 |
| Nov. 27 | do | 52 | 48 | 1.55 | 4.24 | 74.0 |
| Dec. 11 | do | 51 | 46 | 1.48 | 4.13 | 65.0 |
| Dec. 27 | do | 50 | 43 | 1.36 | 4.03 | 59.0 |

DAILY GAUGE HEIGHT AND DISCHARGE of Crowsnest River near Frank, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 4.29 | 84 | 4.13 | 60 | 4.00 | 44 | 4.17 | 65 | 5.60 | 531 | 5.30 | 411 |
| 2 | 4.28 | 82 | 4.13 | 60 | 3.95 | 39 | 4.25 | 77 | 6.70 | 1,232 | 5.30 | 411 |
| 3 | 4.28 | 82 | 4.14 | 61 | 3.98 | 42 | 4.75 | 236 | 5.95 | 737 | 5.28 | 404 |
| 4 | 4.27 | 81 | 4.12 | 58 | 4.00 | 44 | 4.65 | 198 | 5.75 | 610 | 5.25 | 394 |
| 5 | 4.25 | 77 | 4.10 | 56 | 4.00 | 44 | 4.60 | 178 | 5.60 | 531 | 5.27 | 401 |
| 6 | 4.24 | 75 | 4.12 | 58 | 4.00 | 44 | 4.55 | 158 | 5.50 | 486 | 5.24 | 391 |
| 7 | 4.23 | 74 | 4.12 | 58 | 4.00 | 44 | 4.55 | 158 | 5.57 | 517 | 5.20 | 377 |
| 8 | 4.23 | 74 | 4.11 | 57 | 4.00 | 44 | 4.52 | 146 | 5.65 | 555 | 5.20 | 377 |
| 9 | 4.22 | 72 | 4.11 | 57 | 4.00 | 44 | 4.50 | 138 | 5.75 | 610 | 5.17 | 367 |
| 10 | 4.23 | 74 | 4.11 | 57 | 4.00 | 44 | 4.54 | 154 | 5.90 | 704 | 5.14 | 357 |
| 11 | 4.23 | 74 | 4.10 | 56 | 4.00 | 44 | 4.55 | 158 | 5.75 | 610 | 5.10 | 345 |
| 12 | 4.22 | 72 | 4.08 | 54 | 4.00 | 44 | 4.70 | 217 | 5.55 | 508 | 5.10 | 345 |
| 13 | 4.22 | 72 | 4.07 | 52 | 4.00 | 44 | 4.90 | 285 | 5.75 | 610 | 5.10 | 345 |
| 14 | 4.21 | 71 | 4.05 | 50 | 4.02 | 46 | 4.95 | 300 | 5.75 | 610 | 5.40 | 447 |
| 15 | 4.20 | 69 | 4.05 | 50 | 4.03 | 48 | 4.94 | 297 | 5.70 | 580 | 5.50 | 486 |
| 16 | 4.20 | 69 | 4.06 | 51 | 4.05 | 50 | 4.95 | 300 | 5.65 | 555 | 5.50 | 486 |
| 17 | 4.18 | 66 | 4.08 | 54 | 4.08 | 54 | 5.00 | 315 | 5.70 | 580 | 5.50 | 486 |
| 18 | 4.15 | 62 | 4.08 | 54 | 4.08 | 54 | 5.03 | 324 | 5.90 | 704 | 5.50 | 486 |
| 19 | 4.14 | 61 | 4.07 | 52 | 4.10 | 56 | 5.06 | 333 | 5.75 | 610 | 5.60 | 531 |
| 20 | 4.14 | 61 | 4.06 | 51 | 4.10 | 56 | 5.05 | 330 | 5.60 | 531 | 5.53 | 499 |
| 21 | 4.15 | 62 | 4.05 | 50 | 4.12 | 58 | 5.00 | 315 | 5.50 | 486 | 5.45 | 466 |
| 22 | 4.14 | 61 | 4.05 | 50 | 4.15 | 62 | 4.95 | 300 | 5.45 | 466 | 5.35 | 429 |
| 23 | 4.12 | 58 | 4.03 | 48 | 4.20 | 69 | 4.85 | 269 | 5.43 | 458 | 5.30 | 411 |
| 24 | 4.10 | 56 | 4.02 | 46 | 4.18 | 66 | 4.83 | 263 | 5.42 | 455 | 5.30 | 411 |
| 25 | 4.10 | 56 | 4.02 | 46 | 4.15 | 62 | 4.80 | 253 | 5.40 | 447 | 5.55 | 508 |
| 26 | 4.10 | 56 | 4.03 | 48 | 4.20 | 69 | 4.75 | 236 | 5.40 | 447 | 5.95 | 737 |
| 27 | 4.08 | 54 | 4.05 | 50 | 4.16 | 63 | 4.74 | 232 | 5.35 | 429 | 5.80 | 640 |
| 28 | 4.10 | 56 | 4.03 | 48 | 4.14 | 61 | 4.74 | 232 | 5.35 | 429 | 5.65 | 555 |
| 29 | 4.12 | 58 | ..... | ..... | 4.14 | 61 | 4.74 | 232 | 5.40 | 447 | 5.55 | 508 |
| 30 | 4.12 | 58 | ..... | ..... | 4.14 | 61 | 5.10 | 345 | 5.35 | 429 | 5.50 | 486 |
| 31 | 4.12 | 58 | ..... | ..... | 4.15 | 62 | ..... | ..... | 5.32 | 418 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Crowsnest River near Frank, for 1915.—*Concluded*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 5.47 | 474 | 5.00 | 315 | 4.35 | 95 | 4.38 | 102 | 4.43 | 114 | 4.10 | 56 |
| 2 | 5.45 | 466 | 4.92 | 291 | 4.37 | 99 | 4.50 | 138 | 4.43 | 114 | 4.08 | 54 |
| 3 | 5.45 | 466 | 4.85 | 269 | 4.36 | 97 | 4.45 | 120 | 4.42 | 112 | 4.15 | 62 |
| 4 | 5.40 | 447 | 4.80 | 253 | 4.35 | 95 | 4.45 | 120 | 4.40 | 106 | 4.20 | 69 |
| 5 | 5.35 | 429 | 4.75 | 236 | 4.35 | 95 | 4.45 | 120 | 4.40 | 106 | 4.24 | 75 |
| 6 | 5.35 | 429 | 4.72 | 225 | 4.34 | 93 | 4.44 | 117 | 4.40 | 106 | 4.24 | 75 |
| 7 | 5.33 | 422 | 4.72 | 225 | 4.33 | 91 | 4.42 | 112 | 4.38 | 102 | 4.22 | 72 |
| 8 | 5.29 | 408 | 4.70 | 217 | 4.33 | 91 | 4.40 | 106 | 4.38 | 102 | 4.24 | 75 |
| 9 | 5.23 | 387 | 4.67 | 206 | 4.35 | 95 | 4.38 | 102 | 4.35 | 95 | 4.26 | 79 |
| 10 | 5.20 | 377 | 4.63 | 190 | 4.35 | 95 | 4.38 | 102 | 4.34 | 93 | 4.20 | 69 |
| 11 | 5.10 | 345 | 4.60 | 178 | 4.34 | 93 | 4.37 | 99 | 4.27 | 81 | 4.20 | 69 |
| 12 | 5.00 | 315 | 4.60 | 178 | 4.33 | 91 | 4.36 | 97 | 4.27 | 81 | 4.18 | 66 |
| 13 | 4.98 | 309 | 4.57 | 166 | 4.33 | 91 | 4.35 | 95 | 4.25 | 77 | 4.15 | 62 |
| 14 | 4.98 | 309 | 4.55 | 158 | 4.32 | 90 | 4.35 | 95 | 4.25 | 77 | 4.12 | 58 |
| 15 | 4.95 | 300 | 4.55 | 158 | 4.30 | 86 | 4.36 | 97 | 4.24 | 75 | 4.05 | 50 |
| 16 | 4.90 | 285 | 4.55 | 158 | 4.30 | 86 | 4.36 | 97 | 4.24 | 75 | 3.98 | 42 |
| 17 | 4.88 | 279 | 4.55 | 158 | 4.30 | 86 | 4.35 | 95 | 4.23 | 74 | 3.93 | 37 |
| 18 | 4.88 | 279 | 4.55 | 158 | 4.30 | 86 | 4.35 | 95 | 4.23 | 74 | 3.88 | 33 |
| 19 | 4.87 | 275 | 4.54 | 154 | 4.35 | 95 | 4.38 | 102 | 4.22 | 72 | 4.02 | 46 |
| 20 | 4.85 | 269 | 4.53 | 150 | 4.34 | 93 | 4.38 | 102 | 4.22 | 72 | 4.03 | 48 |
| 21 | 4.84 | 266 | 4.52 | 146 | 4.32 | 90 | 4.36 | 97 | 4.21 | 71 | 3.96 | 40 |
| 22 | 4.83 | 263 | 4.50 | 138 | 4.32 | 90 | 4.36 | 97 | 4.20 | 69 | 4.00 | 44 |
| 23 | 4.82 | 259 | 4.50 | 138 | 4.35 | 95 | 4.35 | 95 | 4.20 | 69 | 4.00 | 44 |
| 24 | 4.80 | 253 | 4.47 | 127 | 4.40 | 106 | 4.35 | 95 | 4.18 | 66 | 4.00 | 44 |
| 25 | 4.79 | 250 | 4.45 | 120 | 4.41 | 109 | 4.35 | 95 | 4.18 | 66 | 4.05 | 50 |
| 26 | 4.78 | 246 | 4.43 | 114 | 4.38 | 102 | 4.35 | 95 | 4.18 | 66 | 4.02 | 46 |
| 27 | 4.85 | 269 | 4.43 | 114 | 4.38 | 102 | 4.35 | 95 | 4.18 | 66 | 4.03 | 48 |
| 28 | 4.84 | 266 | 4.42 | 112 | 4.38 | 102 | 4.38 | 102 | 4.20 | 69 | 3.96 | 40 |
| 29 | 5.00 | 315 | 4.40 | 106 | 4.38 | 102 | 4.45 | 120 | 4.16 | 63 | 4.00 | 44 |
| 30 | 5.00 | 315 | 4.38 | 102 | 4.38 | 102 | 4.45 | 120 | 4.13 | 60 | 4.00 | 44 |
| 31 | 5.00 | 315 | 4.36 | 97 | ..... | ..... | 4.43 | 114 | ..... | ..... | 4.00 | 44 |

MONTHLY DISCHARGE of Crowsnest River near Frank, for 1915.

(Drainage area 168 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 84 | 54 | 67 | 0.399 | 0.46 | 4,120 |
| February | 61 | 46 | 53 | 0.315 | 0.33 | 2,943 |
| March | 69 | 39 | 52 | 0.311 | 0.36 | 3,197 |
| April | 345 | 65 | 235 | 1.400 | 1.56 | 13,983 |
| May | 1,232 | 418 | 559 | 3.327 | 3.83 | 34,372 |
| June | 737 | 345 | 450 | 2.679 | 2.99 | 26,777 |
| July | 474 | 246 | 332 | 1.976 | 2.28 | 20,414 |
| August | 315 | 97 | 173 | 1.030 | 1.19 | 10,637 |
| September | 109 | 86 | 95 | 0.565 | 0.63 | 5,653 |
| October | 138 | 95 | 104 | 0.619 | 0.71 | 6,395 |
| November | 114 | 60 | 82 | 0.490 | 0.55 | 4,879 |
| December | 79 | 33 | 54 | 0.324 | 0.37 | 3,320 |
| The year | ..... | ..... | ..... | ..... | 15.26 | 136,690 |

## CROWSNEST RIVER NEAR LUNDBRECK.

*Location.*—On the NE. ¼ Sec. 26, Tp. 7, Rge. 2, W. 5th Mer., at the traffic bridge just north of Lundbreck.

*Records available.*—September 7, 1907, to December 31, 1915.

*Gauge.*—Chain, on downstream side of the traffic bridge about 75 feet upstream from the old staff gauge. Elevation at zero of staff gauge maintained at 91.82 feet during 1912–13. Elevation at zero of chain gauge maintained at 90.86 feet during 1914–15.

*Bench-mark.*—Permanent bench-mark cut in the left wing-wall on the downstream side. Assumed elevation 100.00 feet.

*Channel.*—Rocky formation and fairly permanent.

*Discharge measurements.*—Made from the traffic bridge.

*Winter flow.*—Records are obtained throughout the frozen period.

*Observer.*—Ed. Marlow.

Discharge Measurements of Crowsnest River near Lundbreck, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Feb. 9 | F. R. Steinberger | 61 | 72 | 1.14 | 3.52 | 82 |
| Feb. 26 | do | 63 | 73 | 0.94 | 3.43 | 68 |
| Mar. 11 | P. H. Daniells | 52 | 65 | 1.12 | 1.71 | 73 |
| Mar. 30 | do | 54 | 64 | 1.62 | 1.84 | 104 |
| April 9 | do | 57 | 92 | 2.26 | 2.28 | 208 |
| April 22 | do | 64 | 122 | 3.11 | 2.82 | 379 |
| May 10 | W. R. McCaffrey | 70 | 192 | 4.70 | 3.80 | 902 |
| May 21 | G. H. Whyte and W. R. McCaffrey | 68 | 207 | 4.28 | 3.66 | 886 |
| June 4 | W. R. McCaffrey | 67 | 159 | 3.46 | 3.10 | 551 |
| June 18 | do | 68 | 179 | 3.57 | 3.49 | 639 |
| July 7 | do | 67 | 157 | 4.04 | 3.27 | 635 |
| July 20 | do | 63 | 130 | 3.06 | 2.73 | 399 |
| July 31 | do | 63 | 125 | 3.14 | 2.75 | 394 |
| Aug. 19 | do | 60 | 104 | 2.32 | 2.32 | 242 |
| Sept. 13 | do | 57 | 87 | 2.00 | 2.06 | 174 |
| Sept. 29 | do | 59 | 86 | 2.14 | 2.12 | 175 |
| Oct. 15 | do | 58 | 88 | 2.06 | 2.08 | 181 |
| Nov. 2 | do | 56 | 84 | 1.98 | 2.13 | 166 |
| Nov. 16 | do | 56 | 87 | 1.67 | 2.26 | 146 |
| Nov. 30 | do | 57 | 85 | 1.12 | 2.40 | 94 |
| Dec. 14 | do | 57 | 81 | 1.14 | 2.21 | 92 |
| Dec. 31 | do | 42 | 55 | 0.94 | 2.53 | 52 |

DAILY GAUGE HEIGHT AND DISCHARGE of Crowsnest River near Lundbreck, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.10 | 148 | 3.40 | 101 | 3.45 | 68 | 1.86 | 104 | 3.50 | 734 | 3.18 | 552 |
| 2 | 3.08 | 147 | 3.55 | 98 | 3.20 | 68 | 2.05 | 149 | 4.55 | 1,467 | 3.23 | 578 |
| 3 | 3.10 | 144 | 3.60 | 96 | 3.55 | 69 | 2.50 | 279 | 4.00 | 1,082 | 3.23 | 578 |
| 4 | 3.06 | 140 | 3.50 | 94 | 3.45 | 70 | 2.45 | 262 | 3.90 | 1,012 | 3.11 | 518 |
| 5 | 2.95 | 138 | 3.45 | 91 | 3.40 | 72 | 2.35 | 231 | 3.75 | 907 | 3.13 | 527 |
| 6 | 2.80 | 140 | 3.50 | 89 | 3.50 | 76 | 2.35 | 231 | 3.55 | 768 | 3.12 | 523 |
| 7 | 3.57 | 142 | 3.50 | 86 | 2.65 | 120 | 2.30 | 216 | 3.55 | 768 | 3.07 | 499 |
| 8 | 3.60 | 145 | 3.50 | 84 | 2.05 | 140 | 2.30 | 216 | 3.70 | 872 | 3.02 | 477 |
| 9 | 3.50 | 147 | 3.55 | 82 | 1.70 | 75 | 2.25 | 202 | 3.65 | 837 | 2.97 | 455 |
| 10 | 3.45 | 149 | 3.55 | 81 | 1.70 | 75 | 2.40 | 246 | 3.80 | 942 | 3.02 | 477 |
| 11 | 3.50 | 150 | 3.45 | 80 | 1.70 | 75 | 2.45 | 262 | 3.67 | 851 | 3.02 | 477 |
| 12 | 3.40 | 150 | 3.50 | 78 | 1.70 | 75 | 2.50 | 279 | 3.47 | 715 | 3.02 | 477 |
| 13 | 3.45 | 150 | 3.50 | 76 | 1.75 | 83 | 2.65 | 330 | 4.09 | 1,145 | 3.02 | 477 |
| 14 | 3.30 | 147 | 3.30 | 74 | 1.75 | 83 | 2.75 | 366 | 4.39 | 1,355 | 3.17 | 547 |
| 15 | 3.20 | 128 | 3.25 | 73 | 1.80 | 92 | 2.70 | 348 | 3.64 | 830 | 3.27 | 598 |
| 16 | 3.20 | 130 | 3.85 | 73 | 1.85 | 102 | 2.78 | 377 | 3.64 | 830 | 3.32 | 625 |
| 17 | 3.30 | 134 | 3.55 | 75 | 1.80 | 92 | 2.85 | 405 | 3.54 | 761 | 3.27 | 598 |
| 18 | 3.05 | 137 | 3.55 | 74 | 1.80 | 92 | 2.90 | 425 | 4.09 | 1,145 | 3.47 | 715 |
| 19 | 3.25 | 136 | 3.50 | 71 | 1.75 | 83 | 2.95 | 446 | 3.94 | 1,040 | 3.59 | 795 |
| 20 | 3.45 | 130 | 3.50 | 69 | 1.80 | 92 | 2.89 | 421 | 3.74 | 900 | 3.42 | 684 |
| 21 | 3.35 | 120 | 3.54 | 70 | 1.85 | 102 | 2.85 | 405 | 3.67 | 851 | 3.27 | 598 |
| 22 | 2.90 | 116 | 3.90 | 73 | 1.90 | 113 | 2.80 | 385 | 3.54 | 761 | 3.25 | 588 |
| 23 | 3.30 | 117 | 3.60 | 72 | 1.95 | 124 | 2.70 | 348 | 3.53 | 754 | 3.22 | 572 |
| 24 | 3.40 | 116 | 3.40 | 70 | 1.95 | 124 | 2.65 | 330 | 3.55 | 768 | 3.17 | 547 |
| 25 | 3.30 | 113 | 3.45 | 69 | 1.80 | 92 | 2.63 | 323 | 3.57 | 782 | 3.22 | 572 |
| 26 | 3.30 | 106 | 3.45 | 68 | 1.90 | 113 | 2.60 | 313 | 3.54 | 761 | 3.72 | 886 |
| 27 | 3.28 | 106 | 3.60 | 67 | 1.90 | 113 | 2.55 | 296 | 3.33 | 631 | 3.62 | 816 |
| 28 | 3.25 | 107 | 3.45 | 67 | 1.94 | 122 | 2.55 | 296 | 3.33 | 631 | 3.53 | 754 |
| 29 | 3.60 | 106 | ..... | ..... | 1.95 | 124 | 2.68 | 341 | 3.33 | 631 | 3.48 | 721 |
| 30 | 3.50 | 106 | ..... | ..... | 1.84 | 100 | 2.75 | 366 | 3.23 | 578 | 3.53 | 754 |
| 31 | 3.50 | 104 | ..... | ..... | 1.85 | 102 | ..... | ..... | 3.23 | 578 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Crowsnest River near Lundbreck, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.48 | 721 | 2.90 | 425 | 2.12 | 167 | 2.13 | 170 | 2.13 | 170 | 2.33 | 95 |
| 2 | 3.53 | 754 | 2.78 | 377 | 2.15 | 175 | 2.08 | 157 | 2.13 | 170 | 2.73 | 96 |
| 3 | 3.36 | 648 | 2.70 | 348 | 2.15 | 175 | 2.20 | 188 | 2.08 | 157 | 2.73 | 100 |
| 4 | 3.43 | 690 | 2.68 | 341 | 2.15 | 175 | 2.18 | 183 | 2.08 | 157 | 2.28 | 104 |
| 5 | 3.18 | 552 | 2.60 | 313 | 2.10 | 162 | 2.18 | 183 | 2.08 | 157 | 2.38 | 105 |
| 6 | 3.23 | 578 | 2.60 | 313 | 2.10 | 162 | 2.13 | 170 | 2.06 | 152 | 1.93 | 106 |
| 7 | 3.28 | 604 | 2.55 | 296 | 2.10 | 162 | 2.13 | 170 | 2.03 | 144 | 1.88 | 106 |
| 8 | 3.19 | 557 | 2.60 | 313 | 2.10 | 162 | 2.13 | 170 | 2.03 | 144 | 1.88 | 106 |
| 9 | 3.14 | 532 | 2.50 | 279 | 2.10 | 162 | 2.13 | 170 | 2.03 | 144 | 1.93 | 105 |
| 10 | 3.09 | 508 | 2.45 | 262 | 2.12 | 167 | 2.13 | 170 | 2.06 | 152 | 1.98 | 89 |
| 11 | 3.04 | 486 | 2.45 | 262 | 2.09 | 159 | 2.10 | 162 | 2.08 | 157 | 2.10 | 91 |
| 12 | 2.94 | 442 | 2.40 | 246 | 2.09 | 159 | 2.08 | 157 | 2.08 | 160 | 2.13 | 97 |
| 13 | 2.89 | 421 | 2.38 | 240 | 2.07 | 154 | 2.08 | 157 | 2.18 | 157 | 2.03 | 95 |
| 14 | 2.84 | 401 | 2.38 | 240 | 2.04 | 146 | 2.08 | 157 | 2.18 | 153 | 2.21 | 92 |
| 15 | 2.84 | 401 | 2.35 | 231 | 2.04 | 146 | 2.08 | 157 | 2.23 | 149 | 2.53 | 92 |
| 16 | 2.79 | 381 | 2.32 | 222 | 2.04 | 146 | 2.04 | 146 | 2.26 | 146 | 2.28 | 92 |
| 17 | 2.87 | 413 | 2.30 | 216 | 2.04 | 146 | 2.04 | 146 | 2.46 | 141 | 2.93 | 102 |
| 18 | 2.79 | 381 | 2.35 | 231 | 2.04 | 146 | 2.03 | 144 | 2.30 | 138 | 2.93 | 103 |
| 19 | 2.77 | 374 | 2.35 | 231 | 2.04 | 146 | 2.08 | 157 | 1.98 | 136 | 3.28 | 104 |
| 20 | 2.76 | 370 | 2.35 | 231 | 2.09 | 159 | 2.08 | 157 | 2.04 | 131 | 3.43 | 105 |
| 21 | 2.75 | 366 | 2.32 | 222 | 2.09 | 159 | 2.08 | 157 | 1.96 | 126 | 3.48 | 106 |
| 22 | 2.70 | 348 | 2.30 | 216 | 2.07 | 154 | 2.06 | 152 | 2.15 | 120 | 3.33 | 105 |
| 23 | 2.70 | 348 | 2.30 | 216 | 2.07 | 154 | 2.05 | 149 | 1.96 | 117 | 3.13 | 94 |
| 24 | 2.65 | 330 | 2.25 | 202 | 2.17 | 180 | 2.04 | 146 | 1.88 | 114 | 3.02 | 84 |
| 25 | 2.65 | 330 | 2.25 | 202 | 2.19 | 185 | 2.03 | 144 | 2.13 | 110 | 2.72 | 74 |
| 26 | 2.70 | 348 | 2.25 | 202 | 2.14 | 172 | 2.03 | 144 | 1.98 | 103 | 2.72 | 73 |
| 27 | 2.75 | 366 | 2.22 | 194 | 2.09 | 159 | 2.04 | 146 | 2.33 | 97 | 2.72 | 76 |
| 28 | 2.75 | 366 | 2.18 | 183 | 2.10 | 162 | 2.04 | 146 | 2.16 | 93 | 2.88 | 78 |
| 29 | 2.85 | 405 | 2.17 | 180 | 2.10 | 162 | 2.13 | 170 | 2.48 | 93 | 2.63 | 68 |
| 30 | 2.85 | 405 | 2.15 | 175 | 2.08 | 157 | 2.13 | 170 | 2.40 | 94 | 2.58 | 55 |
| 31 | 2.78 | 377 | 2.15 | 175 | ..... | ..... | 2.13 | 170 | ..... | ..... | 2.53 | 52 |

MONTHLY DISCHARGE of Crowsnest River near Lundbreck, for 1915.

(Drainage area 276 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 150 | 104 | 131 | 0.475 | 0.55 | 8,055 |
| February | 101 | 67 | 79 | 0.286 | 0.30 | 4,387 |
| March | 124 | 68 | 95 | 0.344 | 0.40 | 5,841 |
| April | 446 | 104 | 307 | 1.112 | 1.24 | 18,268 |
| May | 1,467 | 578 | 861 | 3.120 | 3.60 | 52,941 |
| June | 886 | 455 | 600 | 2.174 | 2.43 | 35,702 |
| July | 754 | 330 | 458 | 1.660 | 1.91 | 28,161 |
| August | 425 | 175 | 251 | 0.903 | 1.04 | 15,433 |
| September | 185 | 146 | 161 | 0.583 | 0.65 | 9,580 |
| October | 188 | 144 | 160 | 0.580 | 0.67 | 9,838 |
| November | 170 | 93 | 136 | 0.492 | 0.55 | 8,093 |
| December | 106 | 52 | 92 | 0.333 | 0.38 | 5,657 |
| The year | ..... | ..... | ..... | ..... | 13.72 | 201,956 |

CONNELLY CREEK NEAR LUNDBRECK.

*Location.*—On SE. ¼ Sec. 36, Tp. 7, Rge. 2, W. 5th Mer.

*Records.*—Discharge measurements only are available from August 20, 1908, to December 31, 1915.

*Gauge.*—Vertical staff, nailed to a tree on the left bank.

*Bench-mark.*—On the head of a bolt driven vertically in a notch cut in a leaning tree, on the left bank. Elevation 3.93 feet above the zero of the gauge.

*Discharge measurements.*—Made by wading in high water and by means of an 18-inch weir in low stages.

*Winter flow.*—Discharge measurements are not made during the winter season.

*Observer.*—Gauge height records are available from August 1 to October 31, 1909; since then there has been no observer at this station.

DISCHARGE MEASUREMENTS of Connelly Creek near Lundbreck, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 30 | P. H. Daniells | 11.0 | 5.8 | 0.68 | 2.64 | 4.0 |
| April 9 | do | 11.0 | 5.8 | 0.82 | 2.40 | 4.7 |
| April 22 | do | 11.5 | 5.8 | 0.68 | 2.38 | 4.0 |
| May 10 | W. R. McCaffrey | 12.0 | 8.2 | 1.48 | 2.52 | 12.2 |
| May 21 | G. H. Whyte and W. R. McCaffrey | 12.0 | 10.2 | 2.78 | 2.74 | 28.0 |
| June 4 | W. R. McCaffrey | 11.0 | 9.3 | 1.57 | 2.58 | 14.6 |
| June 18 | do | 13.5 | 10.4 | 3.22 | 2.79 | 34.0 |
| July 7 | do | 13.0 | 12.0 | 2.09 | 2.94 | 25.0 |
| July 20 | do | 12.0 | 8.0 | 1.33 | 2.66 | 10.6 |
| July 31 | do | 12.5 | 9.4 | 1.24 | 2.65 | 11.7 |
| Aug. 19 | do | 12.0 | 7.2 | 0.66 | 2.48 | 4.7 |
| Sept. 13 | do | 11.5 | 6.7 | 0.55 | 2.42 | 3.7 |
| Sept. 29 | do | 12.5 | 6.0 | 0.53 | 2.45 | 3.2 |
| Oct. 15 | do | 11.5 | 6.4 | 0.59 | 2.46 | 3.8 |

COW CREEK NEAR COWLEY.

*Location.*—On NE. ¼ Sec. 14, Tp. 8, Rge. 2, W. 5th Mer., at John Ross' ranch, five miles north of Lundbreck Station.

*Records available.*—August 20, 1908, to October 31, 1915.

*Gauge.*—Vertical staff. Zero elevation maintained at 94.53 feet during 1912–15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Clay and rocks, fairly permanent.

*Discharge measurements.*—Made from a foot-bridge during high water and by wading in low stages.

*Winter flow.*—Discharge measurements are not made during the winter season.

*Observer.*—Wm. Mackay.

DISCHARGE MEASUREMENTS of Cow Creek near Cowley, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 30 | P. H. Daniells | 8.5 | 6.80 | 0.87 | 1.98 | 5.9 |
| April 9 | do | 9.0 | 7.70 | 1.00 | 2.05 | 7.6 |
| April 22 | do | 8.5 | 8.00 | 0.88 | 2.04 | 7.0 |
| May 10 | W. R. McCaffrey | 9.0 | 11.80 | 1.64 | 2.47 | 19.4 |
| May 21 | do | 9.5 | 16.80 | 2.14 | 2.96 | 36.0 |
| June 4 | do | 8.5 | 12.30 | 1.62 | 2.47 | 19.8 |
| June 18 | do | 10.0 | 16.40 | 2.38 | 3.03 | 39.0 |
| July 7 | do | 10.0 | 17.30 | 2.46 | 3.01 | 42.0 |
| July 20 | do | 8.5 | 10.80 | 1.22 | 2.26 | 13.2 |
| July 31 | do | 9.5 | 11.00 | 1.02 | 2.17 | 11.3 |
| Aug. 19 | do | 9.0 | 8.20 | 0.64 | 1.91 | 5.3 |
| Sept. 13 | do | 9.0 | 7.00 | 0.55 | 1.84 | 3.9 |
| Sept. 29 | do | 9.0 | 6.70 | 0.56 | 1.83 | 3.8 |
| Oct. 15 | do | 9.0 | 7.10 | 0.61 | 1.90 | 4.7 |

DAILY GAUGE HEIGHT AND DISCHARGE of Cow Creek near Cowley, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft* |
| 1 | ..... | ..... | 2.40 | 16.8 | 3.17 | 45.0 | 2.45 | 18.4 |
| 2 | ..... | ..... | 2.51 | 20.0 | 3.34 | 52.0 | 2.50 | 20.0 |
| 3 | ..... | ..... | 2.52 | 21.0 | 2.81 | 31.0 | 2.06 | 7.8 |
| 4 | ..... | ..... | 2.25 | 12.3 | 2.50 | 20.0 | 2.46 | 18.7 |
| 5 | ..... | ..... | 2.14 | 9.6 | 3.15 | 44.0 | 2.70 | 27.0 |
| 6 | ..... | ..... | 2.10 | 8.7 | 2.50 | 20.0 | 2.49 | 19.7 |
| 7 | ..... | ..... | 2.08 | 8.5 | 2.48 | 19.4 | 2.51 | 20.0 |
| 8 | ..... | ..... | 2.06 | 7.8 | 2.48 | 19.4 | 2.46 | 18.7 |
| 9 | ..... | ..... | 2.10 | 8.7 | 2.44 | 18.1 | 2.32 | 14.3 |
| 10 | ..... | ..... | 2.00 | 6.6 | 2.44 | 18.1 | 2.37 | 15.8 |
| 11 | ..... | ..... | 2.01 | 6.8 | 2.42 | 17.4 | 2.38 | 16.2 |
| 12 | ..... | ..... | 2.01 | 6.8 | 2.38 | 16.2 | 2.79 | 30.0 |
| 13 | ..... | ..... | 2.05 | 7.6 | 2.43 | 17.8 | 2.59 | 23.0 |
| 14 | 2.55 | 22.0 | 2.10 | 8.7 | 3.19 | 46.0 | 3.00 | 38.0 |
| 15 | 2.50 | 20.0 | 2.11 | 8.9 | 2.96 | 37.0 | 3.53 | 59.0 |
| 16 | 2.69 | 27.0 | 2.08 | 8.3 | 2.81 | 31.0 | 3.18 | 45.0 |
| 17 | 2.78 | 30.0 | 2.06 | 7.8 | 3.01 | 39.0 | 3.60 | 62.0 |
| 18 | 2.55 | 22.0 | 2.06 | 7.8 | 4.22 | 87.0 | 3.06 | 41.0 |
| 19 | 2.41 | 17.1 | 2.05 | 7.6 | 3.50 | 58.0 | 4.74 | 108.0 |
| 20 | 2.45 | 18.4 | 2.05 | 7.6 | 3.10 | 42.0 | 3.05 | 40.0 |
| 21 | 2.31 | 14.0 | 2.05 | 7.6 | 3.00 | 38.0 | 2.76 | 30.0 |
| 22 | 2.35 | 15.2 | 2.04 | 7.4 | 2.97 | 37.0 | 2.70 | 27.0 |
| 23 | 2.40 | 16.8 | 2.03 | 7.2 | 2.81 | 31.0 | 2.65 | 25.0 |
| 24 | 2.21 | 11.3 | 2.03 | 7.2 | 2.70 | 27.0 | 2.59 | 23.0 |
| 25 | 2.17 | 10.0 | 2.03 | 7.2 | 2.76 | 29.0 | 3.66 | 65.0 |
| 26 | 1.94 | 5.5 | 2.03 | 7.2 | 2.68 | 26.0 | 5.24 | 128.0 |
| 27 | 1.90 | 4.8 | 2.02 | 7.0 | 2.60 | 23.0 | 3.52 | 59.0 |
| 28 | 1.99 | 6.4 | 2.01 | 6.8 | 2.60 | 23.0 | 3.09 | 42.0 |
| 29 | 2.05 | 7.6 | 2.01 | 6.8 | 2.57 | 22.0 | 2.91 | 35.0 |
| 30 | 1.95 | 5.7 | 2.08 | 8.3 | 2.52 | 21.0 | 2.96 | 37.0 |
| 31 | 2.10 | 8.7 | ..... | ..... | 2.46 | 18.7 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Cow Creek near Cowley, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.20 | 46.0 | 2.32 | 14.3 | 1.75 | 2.8 | 1.80 | 3.4 |
| 2 | 2.97 | 37.0 | 2.86 | 33.0 | 1.75 | 2.8 | 1.87 | 4.4 |
| 3 | 3.50 | 58.0 | 2.19 | 10.8 | 1.76 | 2.9 | 2.02 | 7.0 |
| 4 | 2.98 | 37.0 | 2.09 | 8.5 | 1.76 | 2.9 | 1.91 | 5.0 |
| 5 | 2.90 | 34.0 | 2.01 | 6.8 | 1.75 | 2.8 | 1.80 | 3.4 |
| 6 | 2.83 | 32.0 | 2.00 | 6.6 | 1.75 | 2.8 | 1.86 | 4.2 |
| 7 | 3.01 | 39.0 | 1.95 | 5.7 | 1.77 | 3.0 | 1.91 | 5.0 |
| 8 | 2.68 | 26.0 | 1.98 | 6.2 | 1.77 | 3.0 | 1.88 | 4.5 |
| 9 | 2.56 | 22.0 | 1.95 | 5.7 | 1.79 | 3.3 | 1.84 | 4.0 |
| 10 | 2.52 | 21.0 | 1.86 | 4.2 | 1.82 | 3.7 | 1.84 | 4.0 |
| 11 | 2.48 | 19.4 | 1.89 | 4.7 | 1.82 | 3.7 | 1.95 | 5.7 |
| 12 | 2.39 | 16.5 | 1.84 | 4.0 | 1.80 | 3.4 | 1.95 | 5.7 |
| 13 | 2.35 | 15.2 | 1.86 | 4.2 | 1.80 | 3.4 | 1.90 | 4.8 |
| 14 | 2.39 | 16.5 | 1.86 | 4.2 | 1.81 | 3.5 | 1.93 | 5.3 |
| 15 | 2.35 | 15.2 | 1.85 | 4.1 | 1.81 | 3.5 | 1.90 | 4.8 |
| 16 | 2.31 | 14.0 | 1.85 | 4.1 | 1.78 | 3.2 | 1.87 | 4.4 |
| 17 | 2.30 | 13.7 | 1.85 | 4.1 | 1.76 | 2.9 | 1.85 | 4.1 |
| 18 | 2.41 | 17.1 | 2.05 | 7.6 | 1.75 | 2.8 | 1.82 | 3.7 |
| 19 | 2.31 | 14.0 | 1.88 | 4.5 | 1.75 | 2.8 | 1.89 | 4.7 |
| 20 | 2.26 | 12.6 | 2.00 | 6.6 | 1.77 | 3.0 | 1.90 | 4.8 |
| 21 | 2.21 | 11.3 | 1.96 | 5.9 | 1.75 | 2.8 | 1.85 | 4.1 |
| 22 | 2.19 | 10.8 | 1.91 | 5.0 | 1.75 | 2.8 | 1.80 | 3.4 |
| 23 | 2.12 | 9.1 | 1.91 | 5.0 | 1.77 | 3.0 | 1.78 | 3.2 |
| 24 | 2.12 | 9.1 | 1.87 | 4.4 | 2.11 | 8.9 | 1.78 | 3.2 |
| 25 | 2.11 | 8.9 | 1.85 | 4.1 | 1.97 | 6.1 | 1.79 | 3.3 |
| 26 | 2.31 | 14.0 | 1.80 | 3.4 | 1.85 | 4.1 | 1.80 | 3.4 |
| 27 | 2.26 | 12.6 | 1.75 | 2.8 | 1.84 | 4.0 | 1.82 | 3.7 |
| 28 | 2.47 | 19.0 | 1.79 | 3.3 | 1.84 | 4.0 | 1.81 | 3.5 |
| 29 | 2.42 | 17.4 | 1.77 | 3.0 | 1.83 | 3.8 | 1.90 | 4.8 |
| 30 | 2.32 | 14.3 | 1.76 | 2.9 | 1.83 | 3.8 | 1.85 | 4.1 |
| 31 | 2.18 | 10.5 | 1.75 | 2.8 | ..... | ..... | 1.83 | 3.8 |

MONTHLY DISCHARGE of Cow Creek near Cowley, for 1915.

(Drainage area 29 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (14–31) | 30.0 | 4.8 | 14.6 | 0.503 | 0.34 | 521 |
| April | 21.0 | 6.6 | 9.0 | 0.311 | 0.35 | 536 |
| May | 87.0 | 16.2 | 31.0 | 1.069 | 1.23 | 1,906 |
| June | 128.0 | 7.8 | 37.0 | 1.276 | 1.42 | 2,202 |
| July | 46.0 | 8.9 | 21.0 | 0.724 | 0.83 | 1,291 |
| August | 33.0 | 2.8 | 6.2 | 0.214 | 0.25 | 381 |
| September | 8.9 | 2.8 | 3.5 | 0.124 | 0.14 | 208 |
| October | 7.0 | 3.2 | 4.3 | 0.148 | 0.17 | 264 |
| The period | ..... | ..... | ..... | ..... | 4.73 | 7,309 |

HUFF DITCH NEAR COWLEY.

*Location.*—On the SW. ¼ Sec. 31, Tp. 8, Rge. 1, W. 5th Mer.
*Records available.*—May 10, 1915, to October 31, 1915.
*Gauge.*—Vertical staff. Zero elevation, maintained at 95.41 feet since establishment.
*Bench-mark.*—Nail on post 175 feet west of gauge rod. Assumed elevation, 100.00 feet.
*Discharge measurements.*—Made by wading with meter or with weir.
*Observer.*—W. H. Connor.

DISCHARGE MEASUREMENTS of Huff Ditch near Cowley, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| June 4 | W. R. McCaffrey | 2.0 | 1.0 | 1.32 | 1.85 | 1.32 |
| July 31 | do | ..... | ..... | ..... | ..... | Nil. |

DAILY GAUGE HEIGHT AND DISCHARGE of Huff Ditch near Cowley, for 1915.

| Day. | May. | |
|---|---|---|
| | Gauge Height | Discharge. |
| | *Feet.* | *Sec.-ft.* |
| 1 | 1.32 | 0.18 |
| 2 | Dry. | Nil. |
| 3 | " | " |
| 4 | " | " |
| 5 | " | " |
| 6 | " | " |
| 7 | " | " |
| 8 | " | " |
| 9 | " | " |
| 10 | " | " |
| 11 | " | " |
| 12 | " | " |
| 13 | 1.20 | 0.09 |
| 14 | 1.20 | 0.09 |
| 15 | 1.30 | 0.16 |
| 16 | Dry. | Nil. |
| 17 | " | " |
| 18 | " | " |
| 19 | " | " |
| 20 | " | " |
| 21 | " | " |
| 22 | " | " |
| 23 | " | " |
| 24 | " | " |
| 25 | " | " |
| 26 | 1.20 | 0.09 |
| 27 | 1.19 | 0.09 |
| 28 | 1.20 | 0.09 |
| 29 | 1.19 | 0.09 |
| 30 | Dry. | Nil. |
| 31 | " | " |

No water used after May 29.

MONTHLY DISCHARGE of Huff Ditch near Cowley, for 1915.

| MONTH. | DISCHARGE IN SECOND-FEET | | | Total discharge in Acre feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| May | 0.18 | 0.00 | 0.03 | 1.8 |
| The period | ..... | ..... | ..... | 1.8 |

No water used after May 29.

ELTON DITCH FROM TODD CREEK.

*Location.*—On SW. ¼ Sec. 19, Tp. 8, Rge. 1, W. 5th Mer., on Elton's ranch seven miles north of Cowley.

*Records available.*—June 6, 1914, to October 31, 1915.

*Gauge.*—Vertical staff.

*Bench-mark.*—Two spikes in a post 150 feet south of the gauge. Elevation, 1.66 feet above the zero of the gauge.

*Channel.*—Clay and fairly permanent.

*Discharge measurements.*—Made by wading.

*Observer.*—Cecil Elton.

DISCHARGE MEASUREMENTS of Elton Ditch from Todd Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec. ft* |
| June 4 | W. R. McCaffrey | 2.5 | 1.85 | 1.34 | 2.37 | 2.5 |

DAILY GAUGE HEIGHT AND DISCHARGE of Elton Ditch from Todd Creek, for 1915.

| Day. | June. | |
|---|---|---|
| | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* |
| 1 | Dry. | Nil. |
| 2 | " | " |
| 3 | " | " |
| 4 | 2.45 | 2.80 |
| 5 | 2.29 | 2.20 |
| 6 | 2.28 | 2.20 |
| 7 | 2.40 | 2.60 |
| 8 | 2.39 | 2.60 |
| 9 | 2.35 | 2.40 |
| 10 | 2.38 | 2.50 |
| 11 | 1.29 | 0.04 |
| 12 | 1.25 | 0.02 |
| 13 | Dry. | Nil. |
| 14 | " | " |
| 15 | " | " |
| 16 | " | " |
| 17 | " | " |
| 18 | " | " |
| 19 | " | " |
| 20 | 1.92 | 1.04 |
| 21 | Dry. | Nil. |
| 22 | " | " |
| 23 | 1.73 | 0.63 |
| 24 | Dry. | Nil. |
| 25 | " | " |
| 26 | " | " |
| 27 | " | " |
| 28 | " | " |
| 29 | " | " |
| 30 | " | " |
| 31 | " | " |

No water used after June 23.

MONTHLY DISCHARGE of Elton Ditch from Todd Creek, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| June | 2.80 | Nil. | 0.63 | 37 |
| The period | ..... | ..... | ..... | 37 |

NOTE.—No water used after June 23.

TODD CREEK AT ELTON'S RANCH.

*Location.*—On SW. ¼ Sec. 19, Tp. 8, Rge. 1, W. 5th Mer., near Cecil Elton's house, seven miles north of Cowley.

*Records available.*—August 20, 1908, to October 31, 1915.

*Gauge.*—Vertical staff. Elevation of zero maintained at 93.30 feet during 1909–11. Elevation of zero maintained at 93.02 feet during 1912–15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Sand and gravel; quite permanent.

*Discharge measurements.*—Are made from a foot-bridge during high water, and by wading during low stages.

*Winter flow.*—No discharge measurements are made during the winter season.

*Observer.*—C. W. S. Elton.

DISCHARGE MEASUREMENTS of Todd Creek at Elton's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 30 | P. H. Daniells | 7.5 | 9.2 | 1.28 | 3.83*a* | 12.0 |
| April 9 | do | 20.0 | 20.0 | 0.73 | 2.83 | 14.8 |
| April 22 | do | 20.0 | 17.6 | 0.88 | 2.85 | 15.4 |
| May 10 | W. R. McCaffrey | 20.0 | 25.0 | 1.53 | 3.19 | 39.0 |
| May 21 | G. H. Whyte and W. R. McCaffrey | 20.0 | 36.0 | 2.25 | 3.67 | 81.0 |
| June 4 | W. R. McCaffrey | 20.0 | 30.0 | 1.68 | 3.34 | 51.0 |
| June 18 | do | 21.0 | 37.0 | 2.26 | 3.67 | 84.0 |
| July 7 | do | 20.0 | 40.0 | 2.20 | 3.76 | 89.0 |
| July 20 | do | 20.0 | 29.0 | 1.36 | 3.29 | 40.0 |
| July 31 | do | 20.0 | 27.0 | 1.21 | 3.10 | 33.0 |
| Aug. 19 | do | 20.0 | 21.0 | 0.70 | 2.81 | 14.4 |
| Sept. 13 | do | 20.0 | 19.4 | 0.52 | 2.71 | 10.0 |
| Sept. 29 | do | 20.0 | 19.8 | 0.61 | 2.75 | 12.1 |
| Oct. 15 | do | 20.0 | 22.0 | 0.61 | 2.89 | 13.1 |

*a* Ice at gauge.

DAILY GAUGE HEIGHT AND DISCHARGE of Todd Creek at Elton's Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 4.31 | 60.0 | 3.23 | 39 | 3.35 | 49 |
| 2 | ..... | ..... | 4.06 | 50.0 | 3.78 | 93 | 3.35 | 49 |
| 3 | ..... | ..... | 3.70 | 35.0 | 3.90 | 107 | 3.41 | 54 |
| 4 | ..... | ..... | 3.28 | 35 0 | 3.65 | 79 | 3.37 | 51 |
| 5 | ..... | ..... | 3.08 | 25.0*a* | 3.40 | 53 | 3.37 | 51 |
| 6 | ..... | ..... | 3.03 | 25.0. | 3.36 | 50 | 3.41 | 54 |
| 7 | ..... | ..... | 2.96 | 21.0 | 3.28 | 43 | 3.33 | 47 |
| 8 | ..... | ..... | 2.90 | 18.0 | 3.26 | 41 | 3.33 | 47 |
| 9 | ..... | ..... | 2.91 | 18.5 | 3.23 | 39 | 3.29 | 44 |
| 10 | ..... | ..... | 2.82 | 14.5 | 3.18 | 35 | 3.32 | 46 |
| 11 | ..... | ..... | 2.82 | 14.5 | 3.18 | 35 | 3.27 | 42 |
| 12 | ..... | ..... | 2.84 | 15.3 | 3.16 | 34 | 3.39 | 52 |
| 13 | ..... | ..... | 2 84 | 15.3 | 3.18 | 35 | 3.47 | 60 |
| 14 | ..... | ..... | 2.86 | 16.2 | 3 55 | 68 | 3.54 | 67 |
| 15 | ..... | ..... | 2.86 | 16.2 | 3.63 | 77 | 3.71 | 85 |
| 16 | 5.77 | 70*a* | 2.88 | 17.1 | 3.47 | 60 | 3.83 | 99 |
| 17 | 5.51 | 64 | 2 88 | 17.1 | 3.53 | 66 | 3.69 | 83 |
| 18 | 5.13 | 60 | 2.88 | 17.1 | 3.91 | 108 | 3 67 | 81 |
| 19 | 4.73 | 54 | 2 86 | 16 2 | 4 25 | 149 | 4 53 | 183 |
| 20 | 4.63 | 59 | 2.84 | 15.3 | 3.91 | 108 | 4 31 | 156 |
| 21 | 4.57 | 70 | 2.82 | 14 5 | 3 76 | 91 | 3 79 | 94 |
| 22 | 4.49 | 80 | 2 82 | 14.5 | 3 62 | 76 | 3 60 | 74 |
| 23 | 4.35 | 75 | 2 80 | 13 7 | 3 56 | 69 | 3 55 | 68 |
| 24 | 4.19 | 70 | 2.79 | 13 4 | 3 54 | 67 | 3 49 | 62 |
| 25 | 4.25 | 70 | 2 78 | 13 0 | 3.56 | 69 | 3 58 | 71 |
| 26 | 3 89 | 55 | 2 77 | 12 7 | 3 53 | 66 | 5 27 | 271 |
| 27 | 3.99 | 62 | 2 75 | 12 0 | 3 44 | 57 | 4 63 | 195 |
| 28 | 3 83 | 60 | 2 74 | 11 7 | 3 43 | 56 | 4 09 | 130 |
| 29 | 3 75 | 58 | 2 76 | 12 3 | 3 43 | 56 | 3 83 | 99 |
| 30 | 3 80 | 55 | 2.82 | 14 5 | 3 39 | 52 | 3 72 | 86 |
| 31 | 3 66 | 50 | .. | .. | 3.35 | 49 | | |

*a* to *a* Estimated.

DAILY GAUGE HEIGHT AND DISCHARGE of Todd Creek at Elton's Ranch, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.75 | 90 | 3.05 | 26.0 | 2.66 | 9.1 | 2.72 | 11.0 |
| 2 | 3.76 | 91 | 3.03 | 25.0 | 2.65 | 8.8 | 2.75 | 12.0 |
| 3 | 4.66 | 198 | 3.02 | 24.0 | 2.70 | 10.4 | 2.96 | 21.0 |
| 4 | 4.01 | 120 | 2.97 | 21.0 | 2.68 | 9.8 | 2.90 | 18.0 |
| 5 | 3.86 | 102 | 2.92 | 19.0 | 2.66 | 9.1 | 2.84 | 15.3 |
| 6 | 3.75 | 90 | 2.92 | 19.0 | 2.67 | 9.4 | 2.82 | 14.5 |
| 7 | 3.75 | 90 | 2.92 | 19.0 | 2.66 | 9.1 | 2.80 | 13.7 |
| 8 | 3.59 | 73 | 2.91 | 18.5 | 2.68 | 9.8 | 2.76 | 12.3 |
| 9 | 3.52 | 65 | 2.85 | 15.7 | 2.71 | 10.7 | 2.75 | 12.0 |
| 10 | 3.45 | 58 | 2.82 | 14.5 | 2.75 | 12.0 | 2.75 | 12.0 |
| 11 | 3.39 | 52 | 2.81 | 14.1 | 2.75 | 12.0 | 2.76 | 12.3 |
| 12 | 3.31 | 45 | 2.80 | 13.7 | 2.74 | 11.7 | 2.75 | 12.0 |
| 13 | 3.29 | 44 | 2.81 | 14.1 | 2.72 | 11.0 | 2.80 | 13.7 |
| 14 | 3.30 | 45 | 3.23 | 39.0 | 2.70 | 10.4 | 2.78 | 13.0 |
| 15 | 3.27 | 42 | 2.82 | 14.5 | 2.70 | 10.4 | 2.86 | 16.2 |
| 16 | 3.24 | 40 | 2.80 | 13.7 | 2.70 | 10.4 | 2.79 | 13.4 |
| 17 | 3.23 | 39 | 2.79 | 13.4 | 2.70 | 10.4 | 2.75 | 12.0 |
| 18 | 3.27 | 42 | 2.82 | 14.5 | 2.70 | 10.4 | 2.74 | 11.7 |
| 19 | 3.24 | 40 | 2.77 | 12.7 | 2.72 | 11.0 | 2.74 | 11.7 |
| 20 | 3.23 | 39 | 2.84 | 15.3 | 2.76 | 12.3 | 2.80 | 13.7 |
| 21 | 3.14 | 32 | 2.86 | 16.2 | 2.76 | 12.3 | 2.78 | 13.0 |
| 22 | 3.13 | 32 | 2.83 | 14.9 | 2.74 | 11.7 | 2.74 | 11.7 |
| 23 | 3.06 | 27 | 2.82 | 14.5 | 2.74 | 11.7 | 2.73 | 11.4 |
| 24 | 3.04 | 25 | 2.80 | 13.7 | 2.82 | 14.5 | 2.71 | 10.7 |
| 25 | 3.04 | 25 | 2.80 | 13.7 | 2.88 | 17.1 | 2.72 | 11.0 |
| 26 | 3.14 | 32 | 2.78 | 13.0 | 2.76 | 12.3 | 2.70 | 10.4 |
| 27 | 3.14 | 32 | 2.76 | 12.3 | 2.76 | 12.3 | 2.69 | 10.1 |
| 28 | 3.22 | 38 | 2.74 | 11.7 | 2.74 | 11.7 | 2.70 | 10.4 |
| 29 | 3.25 | 40 | 2.71 | 10.7 | 2.72 | 11.0 | 2.70 | 10.4 |
| 30 | 3.20 | 37 | 2.70 | 12.0 | 2.71 | 10.7 | 2.74 | 11.7 |
| 31 | 3.13 | 32 | 2.67 | 9.4 | ..... | ..... | 2.74 | 11.7 |

MONTHLY DISCHARGE of Todd Creek at Elton's Ranch, for 1915.

(Drainage area 57 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (16-31) | 80.0 | 50.0 | 63.0 | 1.105 | 0.66 | 1,999 |
| April | 60.0 | 11.7 | 19.8 | 0.347 | 0.39 | 1,178 |
| May | 149.0 | 34.0 | 65.0 | 1.140 | 1.31 | 3,997 |
| June | 271.0 | 42.0 | 85.0 | 1.491 | 1.67 | 5,058 |
| July | 198.0 | 25.0 | 57.0 | 1.000 | 1.15 | 3,505 |
| August | 39.0 | 9.4 | 16.4 | 0.288 | 0.33 | 1,008 |
| September | 17.1 | 8.8 | 11.1 | 0.195 | 0.22 | 660 |
| October | 21.0 | 10.1 | 12.7 | 0.223 | 0.26 | 781 |
| The period | ..... | ..... | ..... | ..... | 5.99 | 18,186 |

OLDMAN RIVER NEAR COWLEY.

*Location.*—On the NE. ¼ of Sec. 34, Tp. 7, Rge. 1, W. 5th Mer.

*Records available.*—June 17, 1908, to December 31, 1915. One discharge measurement in 1907.

*Gauge.*—Vertical staff. Elevation of zero maintained at 92 08 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark on right bank. Assumed elevation, 100.00 feet.

*Channel.*—Rock and gravel.

*Discharge measurements.*—Made by means of cable and car; at low water by wading.

*Observer.*—Archie McKay.

DISCHARGE MEASUREMENTS of Oldman River near Cowley, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Feb. 5 | F. R. Steinberger | 93 | 77 | 1.37 | 2.90 | 105 |
| Feb. 25 | do | 85 | 43 | 1.29 | 1.67 | 56 |
| Mar. 13 | P. H. Daniells | 98 | 57 | 1.09 | 1.30 | 62 |
| Mar. 20 | do | 112 | 114 | 1.09 | 2.90 | 124 |
| April 9 | do | 180 | 184 | 1.86 | 1.87 | 344 |
| April 22 | do | 190 | 268 | 2.88 | 2.52 | 770 |
| May 10 | W. R. McCaffrey | 200 | 519 | 5.33 | 3.87 | 2,767 |
| May 22 | do | 200 | 431 | 4.51 | 3.38 | 1,944 |
| June 4 | do | 200 | 432 | 4.19 | 3.28 | 1,812 |
| June 18 | do | 200 | 562 | 5.22 | 3.98 | 2,935 |
| June 28 | do | 205 | 641 | 5.81 | 4.30 | 3,723 |
| July 8 | do | 199 | 409 | 4.36 | 3.29 | 1,783 |
| July 20 | do | 191 | 313 | 3.11 | 2.69 | 983 |
| Aug. 7 | do | 190 | 313 | 2.88 | 2.57 | 903 |
| Aug. 19 | do | 186 | 245 | 2.48 | 2.32 | 608 |
| Sept. 13 | do | 178 | 186 | 1.99 | 2.02 | 371 |
| Sept. 28 | do | 179 | 184 | 1.95 | 2.04 | 359 |
| Oct. 20 | do | 183 | 216 | 2.20 | 2.18 | 474 |
| Nov. 2 | do | 177 | 202 | 2.21 | 2.14 | 426 |
| Nov. 16 | do | 187 | 210 | 1.70 | 2.31 | 357 |
| Dec. 1 | do | 160 | 143 | 1.33 | 1.33 | 190 |
| Dec. 14 | do | 100 | 112 | 1.25 | 1.65 | 140 |
| Dec. 30 | do | 110 | 124 | 0.91 | 2.97 | 113 |

DAILY GAUGE HEIGHT AND DISCHARGE of Oldman River near Cowley, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.43 | 180 | 1.97 | 101 | 2.90 | 55 | 2.13 | 207 | 3.01 | 1,379 | 3.27 | 1,765 |
| 2 | 3.42 | 184 | 2.17 | 101 | 2.50 | 62 | 2.30 | 223 | 3.83 | 2,694 | 3.42 | 2,002 |
| 3 | 3.52 | 187 | 2.17 | 101 | 2.60 | 70 | 3.00 | 240 | 3.73 | 2,516 | 3.40 | 1,970 |
| 4 | 3.42 | 191 | 1.97 | 103 | 2.75 | 77 | 2.91 | 257 | 3.41 | 1,986 | 3.52 | 2,162 |
| 5 | 3.42 | 195 | 1.20 | 105 | 2.90 | 80 | 2.01 | 275 | 3.61 | 2,312 | 3.50 | 2,130 |
| 6 | 3.33 | 197 | 1.20 | 106 | 2.80 | 78 | 2.02 | 295 | 3.51 | 2,146 | 3.51 | 2,146 |
| 7 | 3.42 | 200 | 1.60 | 109 | 2.60 | 71 | 1.95 | 315 | 3.63 | 2,346 | 3.27 | 1,765 |
| 8 | 3.52 | 202 | 1.80 | 114 | 2.40 | 60 | 1.87 | 332 | 3.96 | 2,928 | 3.22 | 1,690 |
| 9 | 3.52 | 203 | 1.80 | 120 | 2.70 | 54 | 1.86 | 344 | 3.99 | 2,992 | 3.16 | 1,600 |
| 10 | 3.42 | 203 | 2.90 | 126 | 2.60 | 52 | 1.96 | 345 | 3.93 | 2,874 | 3.07 | 1,465 |
| 11 | 3.23 | 203 | 3.00 | 134 | 2.60 | 54 | 1.92 | 325 | 3.63 | 2,346 | 3.00 | 1,365 |
| 12 | 3.23 | 203 | 3.20 | 140 | 2.90 | 59 | 2.11 | 426 | 3.46 | 2,066 | 3.00 | 1,365 |
| 13 | 2.43 | 202 | 3.30 | 144 | 2.90 | 62 | 2.23 | 506 | 3.39 | 1,954 | 3.36 | 1,906 |
| 14 | 2.33 | 201 | 3.30 | 146 | 2.90 | 71 | 2.36 | 609 | 3.81 | 2,658 | 3.47 | 2,082 |
| 15 | 3.23 | 200 | 3.20 | 147 | 3.00 | 82 | 2.36 | 609 | 3.89 | 2,802 | 3.67 | 2,414 |
| 16 | 3.15 | 198 | 3.10 | 147 | 3.00 | 90 | 2.38 | 627 | 3.51 | 2,146 | 3.74 | 2,533 |
| 17 | 3.15 | 196 | 3.20 | 145 | 3.20 | 99 | 2.44 | 685 | 3.56 | 2,227 | 3.87 | 2,766 |
| 18 | 2.40 | 194 | 3.10 | 142 | 3.20 | 104 | 2.57 | 822 | 3.76 | 2,568 | 4.00 | 3,010 |
| 19 | 2.50 | 189 | 2.90 | 130 | 2.90 | 113 | 2.59 | 844 | 3.49 | 2,114 | 4.14 | 3,290 |
| 20 | 3.11 | 182 | 2.80 | 112 | 3.00 | 124 | 2.60 | 855 | 3.56 | 2,227 | 4.07 | 3,150 |
| 21 | 3.15 | 174 | 2.80 | 90 | 2.90 | 136 | 2.56 | 811 | 3.46 | 2,066 | 4.00 | 3,010 |
| 22 | 1.95 | 165 | 2.90 | 66 | 2.91 | 150 | 2.29 | 552 | 3.43 | 2,018 | 3.92 | 2,856 |
| 23 | 1.95 | 155 | 3.00 | 57 | 2.71 | 156 | 2.22 | 499 | 3.43 | 2,018 | 3.94 | 2,892 |
| 24 | 1.95 | 144 | 2.80 | 55 | 2.62 | 159 | 2.20 | 485 | 3.56 | 2,227 | 3.54 | 2,194 |
| 25 | 1.95 | 133 | 2.45 | 56 | 2.22 | 156 | 2.22 | 499 | 3.66 | 2,397 | 3.64 | 2,363 |
| 26 | 1.95 | 124 | 2.40 | 55 | 2.22 | 146 | 2.26 | 528 | 3.71 | 2,482 | 4.40 | 3,810 |
| 27 | 2.15 | 116 | 2.90 | 54 | 2.33 | 141 | 2.29 | 552 | 3.61 | 2,312 | 4.67 | 4,350 |
| 28 | 1.75 | 108 | 2.50 | 53 | 2.13 | 150 | 2.31 | 568 | 3.56 | 2,227 | 4.34 | 3,690 |
| 29 | 2.15 | 104 | ... | ... | 2.04 | 162 | 2.29 | 552 | 3.67 | 2,414 | 3.92 | 2,856 |
| 30 | 2.75 | 102 | ... | ... | 2.04 | 177 | 2.40 | 645 | 3.50 | 2,130 | 3.94 | 2,892 |
| 31 | 2.15 | 101 | ... | ... | 2.10 | 191 | | ... | 3.86 | 1,906 | ... | ... |

DAILY GAUGE HEIGHT AND DISCHARGE of Oldman River near Cowley, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.81 | 2,658 | 3.03 | 1,407 | 2.11 | 426 | 2.05 | 390 | 2.14 | 444 | 1.90 | 190 |
| 2 | 3.68 | 2,431 | 3.00 | 1,365 | 2.08 | 408 | 2.15 | 450 | 2.13 | 438 | 1.92 | 194 |
| 3 | 3.63 | 2,346 | 2.85 | 1,160 | 2.11 | 426 | 2.20 | 485 | 2.12 | 432 | 2.00 | 196 |
| 4 | 3.51 | 2,146 | 2.78 | 1,069 | 2.10 | 420 | 2.17 | 464 | 2.13 | 438 | 1.90 | 195 |
| 5 | 3.43 | 2,018 | 2.68 | 946 | 2.07 | 402 | 2.13 | 438 | 2.15 | 450 | 1.85 | 180 |
| 6 | 3.33 | 1,858 | 2.63 | 888 | 2.03 | 380 | 2.11 | 426 | 2.17 | 464 | 1.80 | 170 |
| 7 | 3.32 | 1,842 | 2.57 | 822 | 2.05 | 390 | 2.07 | 402 | 2.13 | 355 | 1.70 | 164 |
| 8 | 3.25 | 1,735 | 2.53 | 778 | 2.03 | 380 | 2.05 | 390 | 2.09 | 342 | 1.85 | 160 |
| 9 | 3.21 | 1,675 | 2.43 | 675 | 2.07 | 402 | 2.03 | 380 | 1.98 | 332 | 1.80 | 150 |
| 10 | 3.13 | 1,555 | 2.39 | 636 | 2.13 | 438 | 2.10 | 420 | 1.98 | 316 | 1.60 | 140 |
| 11 | 3.01 | 1,379 | 2.38 | 627 | 2.14 | 444 | 2.07 | 402 | 2.03 | 306 | 1.65 | 134 |
| 12 | 2.91 | 1,239 | 2.83 | 1,134 | 2.22 | 499 | 2.04 | 385 | 2.00 | 300 | 1.60 | 133 |
| 13 | 2.83 | 1,134 | 2.33 | 584 | 2.10 | 420 | 2.03 | 380 | 1.93 | 296 | 1.65 | 134 |
| 14 | 2.95 | 1,295 | 2.32 | 576 | 2.03 | 380 | 2.03 | 380 | 1.93 | 300 | 1.64 | 140 |
| 15 | 2.85 | 1,160 | 2.34 | 592 | 2.05 | 390 | 2.01 | 370 | 2.23 | 328 | 1.90 | 147 |
| 16 | 2.75 | 1,030 | 2.39 | 636 | 2.07 | 402 | 2.03 | 380 | 2.40 | 357 | 2.00 | 150 |
| 17 | 2.71 | 982 | 2.35 | 600 | 2.02 | 375 | 2.02 | 375 | 2.39 | 354 | 2.05 | 153 |
| 18 | 2.65 | 910 | 2.37 | 618 | 2.00 | 365 | 2.04 | 385 | 2.25 | 343 | 2.00 | 153 |
| 19 | 2.73 | 1,006 | 2.31 | 568 | 1.99 | 360 | 2.00 | 365 | 2.21 | 330 | 2.10 | 150 |
| 20 | 2.69 | 958 | 2.33 | 584 | 2.03 | 380 | 2.08 | 408 | 2.12 | 319 | 2.20 | 148 |
| 21 | 2.63 | 888 | 2.27 | 536 | 2.01 | 370 | 2.08 | 408 | 2.03 | 313 | 2.30 | 146 |
| 22 | 2.63 | 888 | 2.27 | 536 | 2.03 | 380 | 2.07 | 402 | 1.93 | 303 | 2.40 | 145 |
| 23 | 2.58 | 833 | 2.28 | 544 | 2.11 | 426 | 2.03 | 380 | 2.13 | 287 | 2.60 | 141 |
| 24 | 2.55 | 800 | 2.21 | 492 | 2.13 | 438 | 2.02 | 375 | 2.23 | 273 | 2.70 | 140 |
| 25 | 2.51 | 756 | 2.20 | 485 | 2.14 | 444 | 2.03 | 380 | 2.13 | 262 | 2.70 | 137 |
| 26 | 2.52 | 767 | 2.13 | 438 | 2.03 | 380 | 2.07 | 402 | 2.18 | 236 | 2.75 | 134 |
| 27 | 2.55 | 800 | 2.17 | 464 | 2.05 | 390 | 2.09 | 414 | 1.93 | 200 | 2.80 | 130 |
| 28 | 2.67 | 934 | 2.13 | 438 | 2.03 | 380 | 2.12 | 432 | 1.93 | 183 | 2.85 | 127 |
| 29 | 2.81 | 1,108 | 2.11 | 426 | 2.02 | 375 | 2.13 | 438 | 1.93 | 180 | 2.80 | 120 |
| 30 | 2.85 | 1,160 | 2.11 | 426 | 2.01 | 370 | 2.14 | 444 | 1.83 | 185 | 2.92 | 113 |
| 31 | 2.93 | 1,267 | 2.11 | 426 | ..... | ..... | 2.17 | 464 | ..... | ..... | 2.90 | 110 |

MONTHLY DISCHARGE of Oldman River near Cowley, for 1915.

(Drainage area 800 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 203 | 101 | 172 | 0.215 | 0.25 | 10,576 |
| February | 147 | 53 | 106 | 0.132 | 0.14 | 5,887 |
| March | 191 | 52 | 105 | 0.131 | 0.15 | 6,456 |
| April | 855 | 207 | 494 | 0.618 | 0.69 | 29,395 |
| May | 2,992 | 1,379 | 2,306 | 2.882 | 3.32 | 141,790 |
| June | 4,350 | 1,365 | 2,450 | 3.100 | 3.46 | 145,790 |
| July | 2,658 | 756 | 1,341 | 1.676 | 1.93 | 82,455 |
| August | 1,407 | 426 | 693 | 0.866 | 1.00 | 42,611 |
| September | 499 | 360 | 401 | 0.501 | 0.56 | 23,861 |
| October | 485 | 365 | 407 | 0.509 | 0.59 | 25,025 |
| November | 464 | 180 | 322 | 0.402 | 0.45 | 19,160 |
| December | 196 | 110 | 149 | 0.186 | 0.21 | 9,162 |
| The year | ..... | ..... | ..... | ..... | 12.75 | 542,168 |

CANYON CREEK NEAR MOUNTAIN MILL.

*Location.*—On the NE. ¼ Sec. 14, Tp. 6, Rge. 2, W. 5th Mer.

*Records available.*—April 10, 1911, to October 31, 1915. Discharge measurements only in 1910.

*Gauge.*—Vertical staff.

*Bench-mark.*—Spike in tree on left bank. Elevation, 14.49 feet above zero of gauge.

*Channel.*—Clean gravel and rock.

*Discharge measurements.*—During high stages made at traffic bridge one-half mile upstream; at ordinary stages by wading below the gauge.

*Winter flow.*—Station not maintained during the winter.

*Observer.*—G. Biron.

DISCHARGE MEASUREMENTS of Canyon Creek near Mountain Mill, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 26 | P. H. Daniells | 7.0 | 5.4 | 1.37 | 4.70 | 7.4 |
| April 9 | do | 10.0 | 8.2 | 2.35 | 4.67 | 19.3 |
| April 21 | do | 9.0 | 8.8 | 2.10 | 4.71 | 18.4 |
| May 6 | do | 24.0 | 34.0 | 3.03 | 5.55 | 103.0 |
| May 19 | W. R. McCaffrey | 28.0 | 74.0 | 2.28 | 6.07 | 169.0 |
| June 5 | do | 25.0 | 30.0 | 3.04 | 5.41 | 91.0 |
| June 19 | do | 26.0 | 34.6 | 3.28 | 5.56 | 114.0 |
| July 6 | do | 21.0 | 23.6 | 1.58 | 5.00 | 37.0 |
| July 21 | do | 14.0 | 13.6 | 1.56 | 4.74 | 21.0 |
| Aug. 5 | do | 24.0 | 18.1 | 1.40 | 4.68 | 25.0 |
| Aug. 20 | do | 23.0 | 17.9 | 1.64 | 4.81 | 29.0 |
| Sept. 14 | do | 19.0 | 16.1 | 0.93 | 4.54 | 14.9 |
| Oct. 1 | do | 19.0 | 14.6 | 0.81 | 4.49 | 11.8 |
| Oct. 13 | do | 23.0 | 15.2 | 1.24 | 4.59 | 19.0 |
| Nov. 1 | do | 22.5 | 15.2 | 1.28 | 4.57 | 19.5 |

DAILY GAUGE HEIGHT AND DISCHARGE of Canyon Creek near Mountain Mill, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 4.40 | 8.5 | 5.26 | 68 | 4.99 | 42 |
| 2 | ..... | ..... | 4.55 | 14.8 | 5.92 | 152 | 5.04 | 47 |
| 3 | ..... | ..... | 4.84 | 31.0 | 5.87 | 144 | 5.16 | 58 |
| 4 | ..... | ..... | 4.75 | 25.0 | 5.52 | 99 | 5.51 | 97 |
| 5 | ..... | ..... | 4.68 | 21.0 | 5.72 | 125 | 5.41 | 85 |
| 6 | ..... | ..... | 4.67 | 20.0 | 5.52 | 99 | 5.35 | 78 |
| 7 | ..... | ..... | 4.68 | 21.0 | 5.45 | 90 | 5.19 | 61 |
| 8 | ..... | ..... | 4.67 | 20.0 | 5.44 | 89 | 5.14 | 56 |
| 9 | ..... | ..... | 4.64 | 19.0 | 5.35 | 78 | 5.11 | 53 |
| 10 | ..... | ..... | 4.63 | 18.5 | 5.26 | 68 | 5.15 | 57 |
| 11 | ..... | ..... | 4.63 | 18.5 | 5.20 | 62 | 5.18 | 60 |
| 12 | ..... | ..... | 4.64 | 19.0 | 5.10 | 52 | 5.55 | 102 |
| 13 | ..... | ..... | 4.67 | 20.0 | 5.09 | 51 | 5.35 | 78 |
| 14 | ..... | ..... | 4.76 | 26.0 | 5.56 | 104 | 5.70 | 122 |
| 15 | 4.28 | 5.0 | 4.86 | 32.0 | 5.90 | 149 | 5.65 | 116 |
| 16 | 4.28 | 5.0 | 4.80 | 28.0 | 5.78 | 132 | 5.55 | 102 |
| 17 | 4.30 | 5.5 | 4.77 | 26.0 | 5.77 | 131 | 5.50 | 96 |
| 18 | 4.39 | 8.2 | 4.74 | 24.0 | 6.27 | 202 | 4.74 | 127 |
| 19 | 4.31 | 5.8 | 4.73 | 24.0 | 6.17 | 186 | 5.56 | 104 |
| 20 | 4.26 | 4.5 | 4.72 | 23.0 | 5.82 | 138 | 5.43 | 88 |
| 21 | 4.30 | 5.5 | 4.70 | 22.0 | 5.67 | 118 | 5.35 | 78 |
| 22 | 4.34 | 6.7 | 4.69 | 22.0 | 5.57 | 105 | 5.29 | 71 |
| 23 | 4.42 | 9.3 | 4.67 | 20.0 | 5.52 | 99 | 5.26 | 68 |
| 24 | 4.35 | 7.0 | 4.66 | 20.0 | 5.42 | 86 | 5.18 | 60 |
| 25 | 4.36 | 7.3 | 4.64 | 19.0 | 5.39 | 83 | 5.15 | 57 |
| 26 | 4.46 | 10.9 | 4.63 | 18.5 | 5.31 | 73 | 5.44 | 89 |
| 27 | 4.46 | 10.9 | 4.63 | 18.5 | 5.21 | 63 | 5.30 | 72 |
| 28 | 4.34 | 6.7 | 4.62 | 18.0 | 5.16 | 58 | 5.18 | 60 |
| 29 | 4.35 | 7.0 | 4.61 | 17.5 | 5.13 | 55 | 5.10 | 52 |
| 30 | 4.32 | 6.1 | 4.60 | 17.0 | 5.06 | 48 | 5.10 | 52 |
| 31 | 4.36 | 7.3 | ..... | ..... | 5.01 | 44 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Canyon Creek near Mountain Mill, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 5.13 | 55.0 | 5.04 | 47.0 | 4.31 | 5.8 | 4.47 | 11.3 |
| 2 | 5.10 | 52.0 | 4.89 | 34.0 | 4.32 | 6.1 | 4.51 | 13.0 |
| 3 | 5.11 | 53.0 | 4.81 | 29.0 | 4.48 | 11.7 | 4.55 | 14.8 |
| 4 | 5.00 | 43.0 | 4.75 | 25.0 | 4.42 | 9.3 | 4.53 | 13.8 |
| 5 | 4.93 | 37.0 | 4.70 | 22.0 | 4.34 | 6.7 | 4.53 | 13.8 |
| 6 | 5.01 | 44.0 | 4.66 | 20.0 | 4.31 | 5.8 | 4.58 | 16.1 |
| 7 | 5.03 | 46.0 | 4.64 | 19.0 | 4.31 | 5.8 | 4.56 | 15.2 |
| 8 | 4.89 | 34.0 | 4.63 | 18.5 | 4.32 | 6.1 | 4.54 | 14.3 |
| 9 | 4.85 | 32.0 | 4.52 | 13.4 | 4.53 | 13.8 | 4.52 | 13.4 |
| 10 | 4.83 | 30.0 | 4.52 | 13.4 | 4.75 | 25.0 | 4.53 | 13.8 |
| 11 | 4.78 | 27.0 | 4.52 | 13.4 | 4.64 | 19.0 | 4.54 | 14.3 |
| 12 | 4.75 | 25.0 | 4.51 | 13.0 | 4.57 | 15.7 | 4.58 | 16.1 |
| 13 | 4.71 | 23.0 | 4.51 | 13.0 | 4.52 | 13.4 | 4.61 | 17.5 |
| 14 | 4.75 | 25.0 | 4.52 | 13.4 | 4.53 | 13.8 | 4.60 | 17.0 |
| 15 | 4.70 | 22.0 | 4.49 | 12.1 | 4.53 | 13.8 | 4.64 | 19.0 |
| 16 | 4.66 | 20.0 | 4.51 | 13.0 | 4.52 | 13.4 | 4.61 | 17.5 |
| 17 | 4.74 | 24.0 | 4.47 | 11.3 | 4.49 | 12.1 | 4.60 | 17.0 |
| 18 | 5.10 | 52.0 | 4.48 | 11.7 | 4.50 | 12.5 | 4.58 | 16.1 |
| 19 | 4.10 | 1.0 | 4.47 | 11.3 | 4.49 | 12.1 | 4.61 | 17.5 |
| 20 | 4.78 | 27.0 | 4.82 | 29.0 | 4.49 | 12.1 | 4.60 | 17.0 |
| 21 | 4.72 | 23.0 | 4.70 | 22.0 | 4.47 | 11.3 | 4.59 | 16.6 |
| 22 | 4.67 | 20.0 | 4.57 | 15.7 | 4.45 | 10.5 | 4.56 | 15.2 |
| 23 | 4.62 | 18.0 | 4.56 | 15.2 | 4.44 | 10.1 | 4.54 | 14.2 |
| 24 | 4.60 | 17.0 | 4.51 | 13.0 | 4.61 | 17.5 | 4.54 | 14.3 |
| 25 | 4.64 | 19.0 | 4.48 | 11.7 | 4.55 | 14.8 | 4.53 | 13.8 |
| 26 | 4.93 | 37.0 | 4.44 | 10.1 | 4.52 | 13.4 | 4.53 | 13.8 |
| 27 | 4.75 | 25.0 | 4.41 | 8.9 | 4.49 | 12.1 | 4.53 | 13.8 |
| 28 | 5.05 | 48.0 | 4.35 | 7.0 | 4.51 | 13.0 | 4.52 | 13.4 |
| 29 | 5.07 | 49.0 | 4.36 | 7.3 | 4.52 | 13.4 | 4.51 | 13.0 |
| 30 | 5.03 | 46.0 | 4.36 | 7.3 | 4.49 | 12.1 | 4.50 | 12.5 |
| 31 | 4.87 | 33.0 | 4.31 | 5.8 | ..... | ..... | 4.51 | 13.0 |

MONTHLY DISCHARGE of Canyon Creek near Mountain Mill, for 1915.

(Drainage area 27 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (15-31) | 10.9 | 4.5 | 7.0 | 0.259 | 0.16 | 236 |
| April | 32.0 | 8.5 | 21.0 | 0.778 | 0.87 | 1,250 |
| May | 202.0 | 44.0 | 98.0 | 3.630 | 4.18 | 6,026 |
| June | 127.0 | 42.0 | 76.0 | 2.815 | 3.14 | 4,522 |
| July | 55.0 | 1.0 | 32.0 | 1.185 | 1.37 | 1,968 |
| August | 47.0 | 5.8 | 16.3 | 0.604 | 0.70 | 1,002 |
| September | 25.0 | 5.8 | 12.1 | 0.448 | 0.50 | 720 |
| October | 19.0 | 11.3 | 14.9 | 0.552 | 0.64 | 916 |
| The period | ..... | ..... | ..... | ..... | 11.56 | 16,640 |

MILL CREEK NEAR MOUNTAIN MILL.

*Location.*—On the SW. ¼ Sec. 18, Tp. 6, Rge. 1, West of the 5th Meridian.
*Records available.*—July 7, 1910, to October 31, 1915.
*Gauge.*—Vertical staff. Elevation of zero maintained at 93.41 feet since establishment.
*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.
*Channel.*—Coarse gravel.
*Discharge measurements.*—By wading at ordinary stages and from bridge at flood stages.
*Winter flow.*—Station not maintained during the winter.
*Observer.*—K. B. Parsons.

DISCHARGE MEASUREMENTS of Mill Creek at Mountain Mill, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec. ft.* |
| Mar. 26 | P. H. Daniells | 30 | 30 | 0.67 | 1.58 | 20 |
| April 8 | do | 38 | 34 | 1.54 | 1.54 | 53 |
| April 21 | do | 46 | 53 | 2.42 | 2.27 | 128 |
| May 6 | do | 61 | 92 | 3.88 | 2.75 | 357 |
| May 19 | W. R. McCaffrey | 71 | 117 | 4.24 | 2.95 | 496 |
| June 5 | do | 67 | 132 | 4.70 | 3.25 | 619 |
| June 19 | do | 64 | 126 | 4.61 | 2.94 | 503 |
| July 6 | do | 45 | 53 | 3.38 | 2.22 | 178 |
| July 21 | do | 47 | 55 | 3.22 | 2.23 | 177 |
| Aug. 5 | do | 47 | 56 | 3.47 | 2.31 | 195 |
| Aug. 20 | do | 36 | 38 | 2.86 | 1.93 | 108 |
| Sept. 14 | do | 34 | 31 | 2.26 | 1.77 | 70 |
| Oct. 1 | do | 36 | 41 | 2.69 | 1.94 | 110 |
| Oct. 13 | do | 39 | 39 | 2.81 | 1.99 | 110 |
| Nov. 1 | do | 36 | 36 | 2.48 | 1.89 | 88 |

DAILY GAUGE HEIGHT AND DISCHARGE of Mill Creek neat Mountain Mill, for 1915.

| Day. | April. | | May. | | June. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | | | 2.84 | 424 | 2.45 | 248 |
| 2 | | | 2.95 | 479 | 2.50 | 268 |
| 3 | | | | 650*a* | 2.56 | 294 |
| 4 | | | | 590 | 3.27 | 639 |
| 5 | | | | 460*a* | 3.24 | 624 |
| 6 | | | 2.74 | 376 | 3.14 | 574 |
| 7 | | | 2.86 | 434 | 3.02 | 514 |
| 8 | 1.54 | 53 | 3.15 | 579 | 2.86 | 434 |
| 9 | | | 3.15 | 579 | 2.80 | 405 |
| 10 | | | 3.05 | 529 | 2.85 | 430 |
| 11 | | | 2.89 | 449 | 2.98 | 494 |
| 12 | | | 2.65 | 334 | 3.00 | 504 |
| 13 | | | 3.01 | 509 | 3.01 | 509 |
| 14 | | | 3.36 | 684 | 3.15 | 579 |
| 15 | | | 3.05 | 529 | 3.25 | 629 |
| 16 | | | 3.20 | 604 | 3.20 | 604 |
| 17 | | | 3.23 | 619 | 3.10 | 554 |
| 18 | 2.10 | 132 | 3.15 | 579 | 3.03 | 519 |
| 19 | 2.10 | 132 | 2.95 | 479 | 2.97 | 489 |
| 20 | 2.15 | 146 | 2.85 | 430 | 2.81 | 410 |
| 21 | 2.25 | 176 | 2.85 | 430 | 2.78 | 395 |
| 22 | 2.27 | 182 | 2.89 | 449 | 2.64 | 329 |
| 23 | 2.20 | 160 | 2.99 | 499 | 2.58 | 302 |
| 24 | 2.15 | 146 | 3.04 | 524 | 2.56 | 294 |
| 25 | 2.15 | 146 | 2.75 | 381 | 2.96 | 484 |
| 26 | 2.15 | 146 | 2.78 | 395 | 2.64 | 329 |
| 27 | 2.15 | 146 | 2.75 | 381 | 2.49 | 264 |
| 28 | 2.13 | 140 | 2.75 | 381 | 2.44 | 244 |
| 29 | 2.13 | 140 | 2.75 | 381 | 2.41 | 232 |
| 30 | 2.45 | 248 | 2.71 | 362 | 2.43 | 240 |
| 31 | | | 2.63 | 325 | | |

*a* to *a* Estimated.

DAILY GAUGE HEIGHT AND DISCHARGE of Mill Creek near Mountain Mill, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.42 | 236 | 2.76 | 386 | 1.67 | 62 | 1.95 | 100 |
| 2 | 2.45 | 248 | 2.53 | 281 | 1.82 | 78 | 2.00 | 109 |
| 3 | 2.36 | 214 | 2.52 | 277 | 1.72 | 66 | 1.98 | 105 |
| 4 | 2.28 | 186 | 2.42 | 236 | 1.67 | 62 | 1.98 | 105 |
| 5 | 2.31 | 196 | 2.30 | 192 | 1.61 | 57 | 2.15 | 146 |
| 6 | 2.23 | 170 | 2.18 | 154 | 1.61 | 57 | 2.10 | 132 |
| 7 | 2.27 | 182 | 2.16 | 149 | 1.72 | 66 | 2.05 | 121 |
| 8 | 2.21 | 163 | 2.07 | 125 | 1.67 | 62 | 2.01 | 111 |
| 9 | 2.17 | 152 | 2.04 | 118 | 1.95 | 100 | 1.97 | 103 |
| 10 | 2.12 | 138 | 1.95 | 100 | 1.90 | 90 | 1.92 | 94 |
| 11 | 2.08 | 127 | 1.92 | 94 | 1.82 | 78 | 1.87 | 85 |
| 12 | 2.04 | 118 | 1.87 | 85 | 1.80 | 75 | 2.05 | 121 |
| 13 | 2.01 | 111 | 1.87 | 85 | 1.76 | 71 | 2.00 | 109 |
| 14 | 1.98 | 105 | 1.87 | 85 | 1.74 | 68 | 1.98 | 105 |
| 15 | 1.94 | 98 | 1.87 | 85 | 1.85 | 83 | 1.95 | 100 |
| 16 | 1.94 | 98 | 1.87 | 85 | 2.09 | 130 | 1.94 | 98 |
| 17 | 2.57 | 298 | 1.87 | 85 | 2.05 | 121 | 1.96 | 101 |
| 18 | 2.61 | 316 | 1.87 | 85 | 2.05 | 121 | 1.95 | 100 |
| 19 | 2.50 | 268 | 1.87 | 85 | 2.10 | 132 | 1.95 | 100 |
| 20 | 2.32 | 199 | 1.92 | 94 | 2.06 | 123 | 2.00 | 109 |
| 21 | 2.18 | 154 | 1.94 | 98 | 2.06 | 123 | 2.00 | 109 |
| 22 | 2.10 | 132 | 1.92 | 94 | 2.15 | 146 | 2.04 | 118 |
| 23 | 2.07 | 125 | 1.90 | 90 | 2.10 | 132 | 2.01 | 111 |
| 24 | 2.07 | 125 | 1.87 | 85 | 2.04 | 118 | 2.02 | 114 |
| 25 | 2.07 | 125 | 1.87 | 85 | 2.00 | 109 | 2.02 | 114 |
| 26 | 2.17 | 152 | 1.86 | 84 | 1.95 | 100 | 2.01 | 111 |
| 27 | 2.36 | 214 | 1.84 | 81 | 2.02 | 114 | 2.00 | 109 |
| 28 | 2.62 | 320 | 1.82 | 78 | 2.07 | 125 | 1.99 | 107 |
| 29 | 2.80 | 405 | 1.77 | 72 | 2.05 | 121 | 1.99 | 107 |
| 30 | 2.72 | 367 | 1.75 | 70 | 1.97 | 103 | 1.97 | 103 |
| 31 | 2.89 | 449 | 1.72 | 66 | ..... | ..... | 1.97 | 103 |

MONTHLY DISCHARGE of Mill Creek near Mountain Mill, for 1915.

(Drainage area 64 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in acre-feet. |
| April (18-30) | 248 | 53 | 149 | 2.330 | 1.21 | 4,137 |
| May | 684 | 325 | 478 | 7.469 | 8.61 | 29,391 |
| June | 639 | 232 | 428 | 6.687 | 7.46 | 25,468 |
| July | 449 | 98 | 200 | 3.125 | 3.60 | 12,298 |
| August | 386 | 66 | 122 | 1.906 | 2.20 | 7,501 |
| September | 146 | 57 | 96 | 1.500 | 1.67 | 5,712 |
| October | 146 | 85 | 108 | 1.687 | 1.94 | 6,641 |
| The period | ..... | ..... | ..... | ..... | 26.69 | 91,148 |

CASTLE RIVER NEAR COWLEY.

*Location.*—On the SW. ¼ Sec. 2, Tp. 7, Rge. 1, W. 5th Mer., at G. W. Buchanan's ranch.

*Records available.*—August 5, 1909, to December 31, 1915; discharge measurements only in 1908.

*Gauge.*—Vertical staff. Elevation of zero maintained at 92.34 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Coarse gravel and not liable to shift.

*Discharge measurements.*—Made from the bridge at all stages.

*Observer.*—G. W. Buchanan.

DISCHARGE MEASUREMENTS of Castle River near Cowley, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 25 | J. E. Caughey | 82 | 206 | 0.78 | 3.39 | 161 |
| Feb. 24 | F. R. Steinberger | 77 | 142 | 0.78 | 3.30 | 112 |
| Mar. 12 | P. H. Daniells | 82 | 169 | 0.68 | 2.73 | 114 |
| Mar. 27 | do | 57 | 71 | 2.10 | 2.61 | 149 |
| April 10 | do | 95 | 167 | 2.35 | 2.36 | 391 |
| April 23 | do | 115 | 261 | 3.78 | 3.15 | 986 |
| May 8 | W. R. McCaffrey | 133 | 493 | 4.82 | 4.26 | 2,378 |
| May 20 | G. H. Whyte and W. R. McCaffrey | 201 | 440 | 4.46 | 4.11 | 1,962 |
| June 3 | W. R. McCaffrey | 175 | 428 | 4.37 | 3.82 | 1,868 |
| June 17 | do | 210 | 533 | 4.56 | 4.25 | 2,428 |
| July 5 | do | 159 | 345 | 3.49 | 3.48 | 1,202 |
| July 19 | do | 143 | 316 | 3.20 | 3.16 | 1,011 |
| Aug. 7 | do | 108 | 256 | 2.59 | 2.81 | 665 |
| Aug. 18 | do | 100 | 209 | 2.28 | 2.50 | 480 |
| Sept. 8 | do | 79 | 106 | 2.92 | 2.20 | 310 |
| Sept. 27 | do | 99 | 203 | 2.42 | 2.51 | 490 |
| Oct. 20 | do | 105 | 242 | 2.34 | 2.61 | 568 |
| Nov. 3 | do | 100 | 210 | 2.32 | 2.52 | 485 |
| Nov. 15 | do | 54 | 93 | 3.46 | 2.45 | 321 |
| Nov. 29 | do | 52 | 65 | 3.24 | 2.54 | 211 |
| Dec. 13 | do | 52 | 69 | 2.63 | 2.54 | 183 |
| Dec. 29 | do | 39 | 64 | 2.93 | 3.99 | 188 |

DAILY GAUGE HEIGHT AND DISCHARGE of Castle River near Cowley, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.50 | 305 | 3.64 | 173 | 3.44 | 110 | 2.01 | 219 | 5.40 | 4,330 | 3.80 | 1,700 |
| 2 | 3.43 | 304 | 3.54 | 173 | 3.49 | 113 | 2.19 | 305 | 5.40 | 4,330 | 3.90 | 1,840 |
| 3 | 3.50 | 302 | 3.24 | 170 | 3.54 | 116 | 2.64 | 568 | 4.40 | 2,630 | 3.82 | 1,728 |
| 4 | 3.55 | 299 | 3.19 | 166 | 3.15 | 120 | 2.61 | 547 | 4.30 | 2,460 | 4.30 | 2,460 |
| 5 | 3.43 | 295 | 3.09 | 160 | 3.15 | 126 | 2.48 | 468 | 4.20 | 2,300 | 4.65 | 3,055 |
| 6 | 3.25 | 290 | 3.14 | 153 | 3.10 | 133 | 2.36 | 396 | 4.10 | 2,140 | 4.25 | 2,380 |
| 7 | 3.22 | 282 | 3.14 | 150 | 3.06 | 137 | 2.38 | 408 | 4.00 | 1,980 | 4.10 | 2,140 |
| 8 | 3.15 | 275 | 3.09 | 145 | 2.94 | 138 | 2.38 | 408 | 4.25 | 2,380 | 4.10 | 2,140 |
| 9 | 3.15 | 266 | 3.09 | 140 | 3.02 | 136 | 2.36 | 396 | 4.40 | 2,630 | 4.00 | 1,980 |
| 10 | 3.20 | 259 | 3.04 | 136 | 3.07 | 126 | 2.36 | 396 | 4.30 | 2,460 | 4.15 | 2,220 |
| 11 | 3.25 | 251 | 2.88 | 134 | 2.89 | 119 | 2.40 | 420 | 4.31 | 2,477 | 4.10 | 2,140 |
| 12 | 3.28 | 244 | 2.93 | 134 | 2.73 | 115 | 2.47 | 462 | 4.11 | 2,156 | 4.00 | 1,980 |
| 13 | 3.30 | 235 | 3.33 | 135 | 2.48 | 111 | 2.59 | 534 | 4.16 | 2,236 | 3.95 | 1,910 |
| 14 | 3.30 | 226 | 3.53 | 137 | 2.18 | 106 | 2.97 | 826 | 4.51 | 2,817 | 4.50 | 2,800 |
| 15 | 3.40 | 218 | 3.63 | 137 | 2.48 | 109 | 3.12 | 958 | 4.61 | 2,987 | 4.60 | 2,970 |
| 16 | 3.09 | 211 | 3.83 | 136 | 3.23 | 115 | 2.97 | 826 | 4.41 | 2,647 | 4.40 | 2,630 |
| 17 | 2.94 | 202 | 3.68 | 135 | 3.53 | 142 | 3.11 | 949 | 4.31 | 2,477 | 4.25 | 2,380 |
| 18 | 2.98 | 195 | 3.43 | 133 | 3.46 | 160 | 3.27 | 1,093 | 4.41 | 2,647 | 4.30 | 2,460 |
| 19 | 2.98 | 186 | 3.33 | 130 | 3.33 | 171 | 3.37 | 1,190 | 4.16 | 2,236 | 4.30 | 2,460 |
| 20 | 3.02 | 180 | 3.18 | 127 | 3.18 | 179 | 3.37 | 1,190 | 4.11 | 2,156 | 4.10 | 2,140 |
| 21 | 3.12 | 175 | 3.11 | 124 | 3.07 | 180 | 3.27 | 1,093 | 4.01 | 1,996 | 4.00 | 1,980 |
| 22 | 3.06 | 170 | 3.03 | 118 | 2.97 | 180 | 3.17 | 1,003 | 3.96 | 1,924 | 3.90 | 1,840 |
| 23 | 3.21 | 165 | 3.13 | 115 | 2.77 | 170 | 3.15 | 985 | 4.01 | 1,996 | 3.80 | 1,700 |
| 24 | 3.35 | 163 | 3.08 | 113 | 2.82 | 144 | 3.15 | 985 | 4.01 | 1,996 | 3.75 | 1,635 |
| 25 | 3.39 | 163 | 3.18 | 108 | 2.67 | 135 | 3.00 | 850 | 3.96 | 1,924 | 4.30 | 2,460 |
| 26 | 3.44 | 160 | 3.43 | 107 | 2.66 | 139 | 2.95 | 810 | 3.91 | 1,854 | 4.10 | 2,140 |
| 27 | 3.44 | 160 | 3.38 | 108 | 2.66 | 149 | 2.95 | 810 | 3.91 | 1,854 | 4.00 | 1,980 |
| 28 | 3.49 | 161 | 3.41*a* | 109 | 2.66 | 158 | 3.00 | 850 | 3.86 | 1,784 | 4.00 | 1,980 |
| 29 | 3.54 | 164 | ..... | ..... | 2.46 | 173 | 3.00 | 850 | 3.81 | 1,714 | 3.80 | 1,700 |
| 30 | 3.59 | 169 | ..... | ..... | 2.06 | 242 | 3.00 | 850 | 3.81 | 1,714 | 3.70 | 1,570 |
| 31 | 3.64 | 172 | ..... | ..... | 1.96 | 196 | ..... | ..... | 3.81 | 1,714 | | |

*a* Interpolated

DAILY GAUGE HEIGHT AND DISCHARGE of Castle River near Cowley, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.65 | 1,510 | 3.40 | 1,220 | 2.20 | 310 | 2.50 | 480 | 2.55 | 510 | 2.50 | 215 |
| 2 | 3.60 | 1,450 | 3.30 | 1,120 | 2.22 | 320 | 2.50 | 480 | 2.55 | 510 | 2.55 | 220 |
| 3 | 3.55 | 1,390 | 3.15 | 985 | 2.30 | 360 | 2.60 | 540 | 2.52 | 492 | 2.45 | 227 |
| 4 | 3.55 | 1,390 | 3.00 | 850 | 2.28 | 350 | 2.60 | 540 | 2.55 | 510 | 2.44 | 229 |
| 5 | 3.48 | 1,308 | 2.90 | 770 | 2.25 | 335 | 2.65 | 575 | 2.55 | 510 | 2.50 | 230 |
| 6 | 3.48 | 1,308 | 2.90 | 770 | 2.21 | 315 | 2.65 | 575 | 2.55 | 510 | 2.55 | 231 |
| 7 | 3.45 | 1,275 | 2.81 | 698 | 2.20 | 310 | 2.60 | 540 | 2.53 | 425 | 2.60 | 230 |
| 8 | 3.24 | 1,066 | 2.75 | 650 | 2.20 | 310 | 2.60 | 540 | 2.50 | 395 | 2.55 | 227 |
| 9 | 3.15 | 985 | 2.60 | 540 | 2.50 | 480 | 2.60 | 540 | 2.50 | 358 | 2.50 | 217 |
| 10 | 3.00 | 850 | 2.60 | 540 | 2.45 | 450 | 2.62 | 554 | 2.50 | 330 | 2.48*a* | 190 |
| 11 | 3.00 | 850 | 2.65 | 575 | 2.40 | 420 | 2.55 | 510 | 2.48 | 325 | 2.46*a* | 168 |
| 12 | 2.95 | 810 | 2.60 | 540 | 2.38 | 408 | 2.53 | 498 | 2.46 | 337 | 2.43*a* | 175 |
| 13 | 2.90 | 770 | 2.55 | 510 | 2.35 | 390 | 2.53 | 498 | 2.40 | 341 | 2.41 | 184 |
| 14 | 2.90 | 770 | 2.50 | 480 | 2.30 | 360 | 2.60 | 540 | 2.43 | 332 | 2.60 | 174 |
| 15 | 2.85 | 730 | 2.50 | 480 | 2.30 | 360 | 2.55 | 510 | 2.45 | 325 | 2.70 | 162 |
| 16 | 2.80 | 690 | 2.50 | 480 | 2.40 | 420 | 2.60 | 540 | 2.45 | 318 | 2.80 | 165 |
| 17 | 2.80 | 690 | 2.50 | 480 | 2.42 | 432 | 2.58 | 528 | 2.45 | 309 | 2.80 | 171 |
| 18 | 3.30 | 1,120 | 2.52 | 492 | 2.45 | 450 | 2.55 | 510 | 2.45 | 300 | 2.80 | 181 |
| 19 | 3.17 | 1,003 | 2.45 | 450 | 2.55 | 510 | 2.58 | 528 | 2.40 | 290 | 2.85 | 188 |
| 20 | 3.00 | 850 | 2.55 | 510 | 2.55 | 510 | 2.62 | 554 | 2.40 | 280 | 2.85 | 194 |
| 21 | 2.95 | 810 | 2.45 | 450 | 2.42 | 432 | 2.60 | 540 | 2.40 | 273 | 2.89 | 197 |
| 22 | 2.90 | 770 | 2.42 | 432 | 2.42 | 432 | 2.60 | 540 | 2.44 | 266 | 2.94 | 200 |
| 23 | 2.85 | 730 | 2.50 | 480 | 2.55 | 510 | 2.60 | 540 | 2.44 | 260 | 2.94 | 201 |
| 24 | 2.80 | 690 | 2.45 | 450 | 2.60 | 540 | 2.58 | 528 | 2.40 | 252 | 2.97 | 200 |
| 25 | 2.80 | 690 | 2.35 | 390 | 2.58 | 528 | 2.58 | 528 | 2.40 | 245 | 3.27 | 200 |
| 26 | 2.90 | 770 | 2.32 | 372 | 2.40 | 420 | 2.55 | 510 | 2.40 | 235 | 3.57 | 196 |
| 27 | 2.95 | 810 | 2.32 | 372 | 2.50 | 480 | 2.55 | 510 | 2.30 | 208 | 3.64 | 194 |
| 28 | 2.95 | 810 | 2.30 | 360 | 2.50 | 480 | 2.55 | 510 | 2.20 | 205 | 3.74 | 190 |
| 29 | 3.40 | 1,220 | 2.28 | 350 | 2.50 | 480 | 2.55 | 510 | 2.51 | 211 | 3.93 | 188 |
| 30 | 3.40 | 1,220 | 2.25 | 335 | 2.50 | 480 | 2.58 | 528 | 2.50 | 212 | 3.74 | 180 |
| 31 | 3.20 | 1,030 | 2.23 | 325 | ..... | ..... | 2.60 | 540 | ..... | ..... | 3.90 | 165 |

*a* Interpolated.

MONTHLY DISCHARGE of Castle River near Cowley, for 1915.

(Drainage area 348 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 305 | 160 | 221 | 0.635 | 0.73 | 13,589 |
| February | 173 | 107 | 136 | 0.391 | 0.41 | 7,553 |
| March | 242 | 106 | 143 | 0.411 | 0.47 | 8,793 |
| April | 1,190 | 219 | 722 | 2.075 | 2.31 | 42,962 |
| May | 4,330 | 1,714 | 2,353 | 6.761 | 7.80 | 144,680 |
| June | 3,055 | 1,570 | 2,150 | 6.178 | 6.89 | 127,930 |
| July | 1,510 | 690 | 980 | 2.816 | 3.25 | 60,258 |
| August | 1,220 | 325 | 563 | 1.618 | 1.87 | 34,618 |
| September | 540 | 310 | 419 | 1.204 | 1.34 | 24,932 |
| October | 575 | 480 | 528 | 1.517 | 1.75 | 32,465 |
| November | 510 | 205 | 336 | 0.966 | 1.08 | 19,993 |
| December | 231 | 162 | 196 | 0.563 | 0.65 | 12,052 |
| The year | ..... | ..... | ..... | ..... | 28.55 | 529,825 |

PINCHER CREEK AT PINCHER CREEK.

*Location.*—On the SW. ¼ Sec. 23, Tp. 6, Rge. 30, W. of the 4th Mer., in the town of Pincher Creek.

*Records available.*—April 1, 1910, to October 31, 1915. Discharge measurements only: 1906–09.

*Gauge.*—Vertical staff. Elevation of zero maintained at 86.35 feet since establishment.
*Bench-mark.*—On right concrete abutment of bridge. Assumed elevation, 100.00 feet.
*Channel.*—Rock, gravel and gumbo.
*Discharge measurements.*—From bridge and by wading.
*Winter flow.*—Station not maintained during the winter.
*Observer.*—Hugh Bertles.

DISCHARGE MEASUREMENTS of Pincher Creek at Pincher Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 27 | P. H. Daniells | 37 | 28 | 1.33 | 2.44 | 37 |
| April 10 | do | 41 | 29 | 1.59 | 2.52 | 46 |
| April 23 | do | 43 | 33 | 1.73 | 2.59 | 57 |
| May 8 | do | 60 | 71 | 3.34 | 3.25 | 237 |
| May 20 | G. H. Whyte and W. R. McCaffrey | 76 | 76 | 3.65 | 3.31 | 280 |
| June 3 | W. R. McCaffrey | 85 | 158 | 5.08 | 4.25 | 921 |
| June 17 | do | 75 | 86 | 3.89 | 3.49 | 335 |
| July 5 | do | 53 | 53 | 2.60 | 3.12 | 138 |
| July 19 | do | 52 | 53 | 2.60 | 3.09 | 137 |
| Aug. 6 | do | 51 | 49 | 2.23 | 3.00 | 110 |
| Aug. 18 | do | 45 | 35 | 1.62 | 2.71 | 56 |
| Sept. 8 | do | 39 | 24 | 1.39 | 2.50 | 34 |
| Sept. 27 | do | 45 | 32 | 1.79 | 2.65 | 57 |
| Oct. 20 | do | 46 | 36 | 2.02 | 2.75 | 72 |

DAILY GAUGE HEIGHT AND DISCHARGE of Pincher Creek at Pincher Creek, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | | | 2.50 | 45 | 3.30 | 236 | 3.01 | 129 |
| 2 | | | 2.81 | 84 | 3.60 | 403 | 3.11 | 161 |
| 3 | | | 2.75 | 73 | 3.25 | 215 | 4.31 | 975 |
| 4 | | | 2.65 | 60 | 3.15 | 175 | 3.56 | 377 |
| 5 | | | 2.60 | 55 | 3.20 | 195 | 3.71 | 479 |
| 6 | | | 2.55 | 50 | 3.07 | 147 | 3.57 | 384 |
| 7 | | | 2.53 | 48 | 3.22 | 203 | 3.47 | 323 |
| 8 | | | 2.50 | 45 | 3.25 | 215 | 3.35 | 259 |
| 9 | | | 2.50 | 45 | 3.20 | 195 | 3.26 | 219 |
| 10 | 2.80 | 40*a* | 2.50 | 45 | 3.15 | 175 | 3.47 | 323 |
| 11 | 2.78 | 50 | 2.50 | 45 | 3.05 | 141 | 3.36 | 264 |
| 12 | 2.82 | 55 | 2.50 | 45 | 2.95 | 113 | 3.46 | 317 |
| 13 | 2.80 | 65 | 2.57 | 52 | 3.27 | 223 | 3.37 | 269 |
| 14 | 2.78 | 65 | 2.84 | 90 | 3.80 | 545 | 3.92 | 638 |
| 15 | 2.82 | 70 | 2.70 | 66 | 3.45 | 311 | 4.02 | 720 |
| 16 | 2.88 | 75 | 2.66 | 61 | 3.40 | 284 | 3.57 | 384 |
| 17 | 2.90 | 80*a* | 2.65 | 60 | 3.65 | 437 | 3.47 | 323 |
| 18 | 2.66 | 61 | 2.65 | 60 | 3.55 | 371 | 3.56 | 377 |
| 19 | 2.64 | 59 | 2.67 | 62 | 3.40 | 284 | 3.47 | 323 |
| 20 | 2.61 | 56 | 2.65 | 60 | 3.30 | 236 | 3.35 | 259 |
| 21 | 2.57 | 52 | 2.64 | 59 | 3.28 | 228 | 3.32 | 245 |
| 22 | 2.60 | 55 | 2.61 | 56 | 3.24 | 211 | 3.27 | 223 |
| 23 | 2.60 | 55 | 2.57 | 52 | 3.24 | 211 | 3.22 | 204 |
| 24 | 2.50 | 45 | 2.55 | 50 | 3.30 | 236 | 3.22 | 203 |
| 25 | 2.45 | 41 | 2.53 | 48 | 3.24 | 211 | 4.08 | 771 |
| 26 | 2.45 | 41 | 2.52 | 47 | 3.16 | 179 | 3.37 | 269 |
| 27 | 2.40 | 37 | 2.50 | 45 | 3.16 | 179 | 3.28 | 228 |
| 28 | 2.35 | 33 | 2.50 | 45 | 3.13 | 168 | 3.22 | 203 |
| 29 | 2.33 | 32 | 2.50 | 45 | 3.11 | 161 | 3.17 | 183 |
| 30 | 2.30 | 30 | 2.70 | 66 | 3.05 | 141 | 3.18 | 187 |
| 31 | 2.40 | 37 | | | 3.01 | 129 | | |

*a* to *a* Estimated.

DAILY GAUGE HEIGHT AND DISCHARGE of Pincher Greek at Pincher Creek, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.32 | 245 | 3.61 | 410 | 2.50 | 45 | 2.63 | 58 |
| 2 | 3.32 | 245 | 3.37 | 269 | 2.50 | 45 | 2.63 | 58 |
| 3 | 3.31 | 241 | 3.32 | 245 | 2.70 | 66 | 2.73 | 70 |
| 4 | 3.25 | 215 | 3.07 | 147 | 2.60 | 55 | 2.73 | 70 |
| 5 | 3.12 | 164 | 3.06 | 144 | 2.57 | 52 | 2.73 | 70 |
| 6 | 3.07 | 147 | 3.01 | 129 | 2.52 | 47 | 2.78 | 78 |
| 7 | 3.02 | 132 | 2.96 | 116 | 2.50 | 45 | 2.74 | 72 |
| 8 | 2.97 | 118 | 2.91 | 104 | 2.50 | 45 | 2.73 | 70 |
| 9 | 2.92 | 106 | 2.81 | 84 | 2.68 | 64 | 2.71 | 67 |
| 10 | 2.89 | 100 | 2.76 | 75 | 2.74 | 72 | 2.75 | 73 |
| 11 | 2.87 | 96 | 2.71 | 67 | 2.64 | 59 | 2.71 | 67 |
| 12 | 2.82 | 86 | 2.66 | 61 | 2.64 | 59 | 2.80 | 82 |
| 13 | 2.92 | 106 | 2.61 | 56 | 2.62 | 57 | 2.80 | 82 |
| 14 | 2.92 | 106 | 2.61 | 56 | 2.62 | 57 | 2.83 | 88 |
| 15 | 2.72 | 69 | 2.61 | 56 | 2.60 | 55 | 2.83 | 88 |
| 16 | 2.62 | 57 | 2.66 | 61 | 2.64 | 59 | 2.81 | 84 |
| 17 | 3.02 | 132 | 2.71 | 67 | 2.64 | 59 | 2.75 | 73 |
| 18 | 3.22 | 203 | 2.71 | 67 | 2.64 | 59 | 2.73 | 70 |
| 19 | 3.11 | 161 | 2.73 | 70 | 2.70 | 66 | 2.75 | 73 |
| 20 | 3.02 | 132 | 2.70 | 66 | 2.66 | 61 | 2.75 | 73 |
| 21 | 2.82 | 86 | 2.70 | 66 | 2.64 | 59 | 2.73 | 70 |
| 22 | 2.77 | 77 | 2.68 | 64 | 2.64 | 59 | 2.70 | 66 |
| 23 | 2.62 | 57 | 2.65 | 60 | 2.70 | 66 | 2.70 | 66 |
| 24 | 2.77 | 77 | 2.60 | 55 | 2.76 | 75 | 2.67 | 62 |
| 25 | 2.72 | 69 | 2.55 | 50 | 2.67 | 62 | 2.65 | 60 |
| 26 | 3.52 | 352 | 2.55 | 50 | 2.67 | 62 | 2.65 | 60 |
| 27 | 3.17 | 183 | 2.55 | 50 | 2.66 | 61 | 2.65 | 60 |
| 28 | 3.57 | 384 | 2.52 | 47 | 2.65 | 60 | 2.63 | 58 |
| 29 | 3.65 | 437 | 2.50 | 45 | 2.63 | 58 | 2.63 | 58 |
| 30 | 3.51 | 346 | 2.50 | 45 | 2.63 | 58 | 2.61 | 56 |
| 31 | 3.36 | 264 | 2.50 | 45 | ..... | ..... | 2.60 | 55 |

MONTHLY DISCHARGE of Pincher Creek at Pincher Creek, for 1915.

(Drainage area 50 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (10–31) | 80 | 30 | 52 | 1.040 | 0.85 | 2,269 |
| April | 90 | 45 | 55 | 1.100 | 1.23 | 3,273 |
| May | 545 | 113 | 231 | 4.620 | 5.33 | 14,204 |
| June | 975 | 129 | 341 | 6.820 | 7.61 | 20,291 |
| July | 437 | 57 | 168 | 3.360 | 3.87 | 10,330 |
| August | 410 | 45 | 94 | 1.880 | 2.17 | 5,780 |
| September | 75 | 45 | 58 | 1.160 | 1.29 | 3,451 |
| October | 88 | 55 | 69 | 1.380 | 1.59 | 4,243 |
| The period | ..... | ..... | ..... | ..... | 23.94 | 63,841 |

OLDMAN RIVER NEAR MACLEOD.

*Location.*—On the NW. ¼ Sec. 10, Tp. 9, Rge. 26, W. 4th Mer., at the traffic bridge.

*Records available.*—July 10, 1910, to December 31, 1915.

*Gauge.*—Vertical staff. Zero of gauge maintained at 91.47 feet during 1913. Zero of gauge maintained at 87.67 feet during 1910, 1911, 1912, 1914 and 1915.

*Bench-mark.*—Permanent bench-mark established on concrete pier. Assumed elevation, 100.00 feet.

*Channel.*—Shifts slightly.
*Discharge measurements.*—Above from bridge.
*Winter flow.*—Records are obtained during the winter season 600 feet below the bridge.
*Observer.*—Mrs. W. A. Jackson.

DISCHARGE MEASUREMENTS of Oldman River near Macleod, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 4 | J. E. Caughey | 102 | 289 | 1.78 | 4.21 | 515 |
| Feb. 11 | F. R. Steinberger | 94 | 245 | 1.47 | 4.08 | 361 |
| Mar. 1 | do | 93 | 221 | 1.43 | 3.90 | 316 |
| Mar. 15 | P. H. Daniells | 100 | 288 | 2.00 | 4.47 | 576 |
| Mar. 31 | do | 96 | 288 | 1.64 | 2.79 | 472 |
| April 13 | do | 102 | 362 | 3.06 | 3.63 | 1,108 |
| April 26 | do | 111 | 461 | 4.10 | 4.36 | 1,889 |
| May 11 | W. R. McCaffrey | 359 | 1,308 | 5.15 | 7.07 | 6,729 |
| May 29 | do | 264 | 1,064 | 5.05 | 6.37 | 5,376 |
| June 10 | do | 332 | 974 | 4.80 | 6.05 | 4,672 |
| June 23 | do | 251 | 1,097 | 5.11 | 6.55 | 5,605 |
| June 29 | do | 343 | 1,278 | 5.05 | 6.99 | 6,451 |
| July 9 | do | 146 | 634 | 5.72 | 5.71 | 3,622 |
| July 27 | do | 115 | 506 | 4.38 | 4.75 | 2,179 |
| Aug. 13 | G. H. Whyte and W. R. McCaffrey | 110 | 437 | 3.60 | 4.30 | 1,578 |
| Aug. 26 | W. R. McCaffrey | 103 | 400 | 2.81 | 3.68 | 1,120 |
| Sept. 15 | do | 109 | 352 | 2.56 | 3.34 | 899 |
| Oct. 4 | do | 104 | 404 | 3.02 | 3.78 | 1,219 |
| Oct. 22 | do | 104 | 414 | 3.00 | 3.73 | 1,243 |
| Nov. 4 | do | 104 | 384 | 2.77 | 3.60 | 1,065 |
| Nov. 18 | do | 96 | 332 | 2.34 | 3.15 | 777 |
| Dec. 16 | do | 96 | 288 | 0.95 | 3.21 | 275 |

DAILY GAUGE HEIGHT AND DISCHARGE of Oldman River near Macleod, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 4.11 | 480 | 3.90 | 354 | 3.88 | 316 | 3.00 | 640 | 5.20 | 2,800 | 5.99 | 4,122 |
| 2 | 4.11 | 496 | 3.90 | 356 | 3.88 | 315 | 3.30 | 850 | 7.84 | 8,712 | 5.99 | 4,122 |
| 3 | 4.01 | 509 | 3.90 | 355 | 3.86 | 308 | 3.60 | 1,070 | 7.84 | 8,712 | 6.09 | 4,742 |
| 4 | 4.01 | 515 | 3.95 | 356 | 3.82 | 299 | 4.00 | 1,410 | 7.74 | 8,432 | 6.90 | 6,310 |
| 5 | 4.01 | 515 | 4.00 | 356 | 3.77 | 294 | 4.00 | 1,410 | 7.59 | 8,023 | 7.00 | 6,530 |
| 6 | 4.01 | 452 | 4.00 | 357 | 3.72 | 300 | 3.90 | 1,320 | 7.54 | 7,888 | 6.80 | 6,100 |
| 7 | 4.01 | 443 | 4.00 | 358 | 3.98 | 317 | 3.80 | 1,230 | 7.39 | 7,484 | 6.35 | 5,210 |
| 8 | 4.00 | 465 | 4.00 | 360 | 3.87 | 338 | 3.80 | 1,230 | 7.24 | 7,100 | 6.24 | 5,012 |
| 9 | 3.90 | 478 | 4.00 | 364 | 4.08 | 370 | 3.75 | 1,190 | 7.24 | 7,100 | 6.15 | 4,850 |
| 10 | 3.80 | 475 | 4.00 | 366 | 4.18 | 400 | 3.70 | 1,150 | 7.24 | 7,100 | 6.04 | 4,652 |
| 11 | 3.70 | 460 | 3.99 | 361 | 4.23 | 430 | 3.70 | 1,150 | 7.24 | 7,100 | 6.00 | 4,580 |
| 12 | 3.70 | 438 | 4.09 | 330 | 4.28 | 462 | 3.70 | 1,150 | 6.50 | 5,500 | 6.00 | 4,580 |
| 13 | 3.70 | 420 | 4.09 | 322 | 4.30 | 504 | 3.80 | 1,230 | 6.35 | 5,210 | 6.30 | 5,120 |
| 14 | 3.80 | 408 | 4.09 | 330 | 4.34 | 541 | 4.40 | 1,800 | 7.40 | 7,510 | 6.50 | 5,500 |
| 15 | 3.80 | 408 | 4.09 | 340 | 4.47 | 576 | 4.50 | 1,900 | 7.40 | 7,510 | 7.10 | 6,760 |
| 16 | 3.75 | 418 | 4.14 | 346 | 5.19 | 618 | 4.80 | 2,250 | 7.39 | 7,484 | 7.21 | 7,025 |
| 17 | 3.67 | 442 | 4.29 | 348 | 3.99 | 619 | 5.00 | 2,510 | 7.38 | 7,458 | 7.36 | 7,406 |
| 18 | 3.60 | 458 | 4.29 | 346 | 3.89 | 600 | 5.07 | 2,608 | 7.38 | 7,458 | 7.51 | 7,807 |
| 19 | 3.57 | 458 | 4.29 | 342 | 3.69 | 578 | 5.10 | 2,650 | 7.25 | 7,125 | 7.61 | 8,277 |
| 20 | 3.50 | 450 | 4.29 | 339 | 3.39 | 561 | 5.13 | 2,695 | 7.10 | 6,760 | 7.46 | 7,672 |
| 21 | 3.50 | 438 | 4.24 | 333 | 3.34 | 555 | 5.18 | 2,770 | 7.00 | 6,530 | 7.01 | 6,553 |
| 22 | 3.50 | 420 | 4.19 | 328 | 3.29 | 550 | 5.00 | 2,510 | 6.85 | 6,205 | 6.71 | 5,920 |
| 23 | 3.55 | 400 | 4.14 | 325 | 3.30 | 540 | 4.80 | 2,250 | 6.60 | 5,700 | 6.55 | 5,600 |
| 24 | 3.60 | 384 | 4.08 | 321 | 3.30 | 528 | 4.65 | 2,070 | 6.60 | 5,700 | 6.41 | 5,320 |
| 25 | 3.65 | 366 | 4.08 | 320 | 3.00 | 510 | 4.40 | 1,800 | 6.50 | 5,500 | 6.41 | 5,320 |
| 26 | 3.75 | 350 | 4.18 | 318 | 2.90 | 460 | 4.36 | 1,760 | 6.40 | 5,300 | 8.41 | 10,308 |
| 27 | 3.80 | 334 | 3.98 | 317 | 2.70 | 444 | 4.30 | 1,700 | 6.40 | 5,300 | 8.01 | 9,188 |
| 28 | 3.75 | 332 | 3.88 | 317 | 2.70 | 440 | 4.30 | 1,700 | 6.35 | 5,210 | 7.51 | 7,807 |
| 29 | 3.75 | 337 | ..... | ..... | 3.00 | 640 | 4.30 | 1,700 | 6.29 | 5,102 | 6.91 | 6,332 |
| 30 | 3.75 | 346 | ..... | ..... | 2.90 | 580 | 4.30 | 1,700 | 6.19 | 4,922 | 6.71 | 5,920 |
| 31 | 3.80 | 352 | ..... | ..... | 2.80 | 520 | ..... | ..... | 6.09 | 4,742 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Oldman River near Macleod, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 6.51 | 5,520 | 5.75 | 3,695 | 3.40 | 920 | 3.48 | 976 | 3.65 | 1,110 | 6.05 | 968 |
| 2 | 6.46 | 5,420 | 5.40 | 3,100 | 3.32 | 864 | 3.47 | 969 | 3.62 | 1,086 | 5.26 | 970 |
| 3 | 6.41 | 5,320 | 5.25 | 2,875 | 3.32 | 864 | 3.79 | 1,222 | 3.60 | 1,070 | 5.45 | 965 |
| 4 | 6.31 | 5,138 | 5.00 | 2,510 | 3.32 | 864 | 3.75 | 1,190 | 3.60 | 1,070 | 5.65 | 950 |
| 5 | 6.21 | 4,958 | 4.80 | 2,250 | 3.32 | 864 | 3.80 | 1,230 | 3.58 | 1,050 | 5.80 | 935 |
| 6 | 6.11 | 4,778 | 4.70 | 2,130 | 3.26 | 822 | 3.75 | 1,190 | 3.55 | 1,037 | 5.80 | 918 |
| 7 | 6.08 | 4,724 | 4.58 | 1,988 | 3.25 | 815 | 3.73 | 1,174 | 3.50 | 1,020 | 5.65 | 883 |
| 8 | 6.06 | 4,688 | 4.50 | 1,900 | 3.30 | 850 | 3.70 | 1,150 | 3.45 | 1,000 | 5.40 | 844 |
| 9 | 5.70 | 3,610 | 4.45 | 1,850 | 3.34 | 878 | 3.65 | 1,110 | 3.40 | 976 | 4.35 | 790 |
| 10 | 5.50 | 3,270 | 4.40 | 1,800 | 3.60 | 1,070 | 3.60 | 1,070 | 3.33 | 960 | 4.00 | 700 |
| 11 | 5.25 | 2,875 | 4.30 | 1,700 | 3.50 | 990 | 3.70 | 1,150 | 3.40 | 950 | 3.55 | 600 |
| 12 | 5.15 | 2,725 | 4.30 | 1,700 | 3.40 | 920 | 3.65 | 1,110 | 3.30 | 932 | 3.40 | 470 |
| 13 | 5.00 | 2,510 | 4.20 | 1,600 | 3.40 | 920 | 3.62 | 1,086 | 3.15 | 910 | 3.80 | 400 |
| 14 | 5.20 | 2,800 | 4.10 | 1,500 | 3.40 | 920 | 3.70 | 1,150 | 3.00 | 880 | 4.00 | 340 |
| 15 | 5.10 | 2,650 | 3.95 | 1,365 | 3.35 | 885 | 3.70 | 1,150 | 3.10 | 847 | 3.40 | 300 |
| 16 | 5.00 | 2,510 | 3.90 | 1,320 | 3.32 | 864 | 3.65 | 1,110 | 3.20 | 820 | 3.10 | 275 |
| 17 | 5.00 | 2,510 | 3.80 | 1,230 | 3.32 | 864 | 3.65 | 1,110 | 3.25 | 797 | 3.50 | 275 |
| 18 | 5.40 | 3,100 | 3.75 | 1,190 | 3.35 | 885 | 3.65 | 1,110 | 3.25 | 777 | 3.40 | 278 |
| 19 | 5.30 | 2,950 | 3.60 | 1,070 | 3.38 | 906 | 3.70 | 1,150 | 3.20 | 765 | 3.40 | 286 |
| 20 | 5.20 | 2,800 | 4.10 | 1,500 | 3.40 | 920 | 3.80 | 1,230 | 3.20 | 758 | 3.60 | 315 |
| 21 | 5.00 | 2,510 | 4.00 | 1,410 | 3.45 | 955 | 3.75 | 1,190 | 3.00 | 743 | 3.90 | 352 |
| 22 | 4.90 | 2,380 | 3.95 | 1,365 | 3.52 | 1,006 | 3.70 | 1,150 | 3.00 | 721 | 4.00 | 396 |
| 23 | 4.80 | 2,250 | 3.90 | 1,320 | 3.55 | 1,030 | 3.65 | 1,110 | 3.10 | 702 | 4.10 | 412 |
| 24 | 4.70 | 2,130 | 3.84 | 1,266 | 3.65 | 1,110 | 3.65 | 1,110 | 3.20 | 690 | 4.50 | 421 |
| 25 | 4.55 | 1,955 | 3.75 | 1,190 | 3.70 | 1,150 | 3.65 | 1,110 | 3.00 | 700 | 4.60 | 426 |
| 26 | 4.40 | 1,800 | 3.65 | 1,110 | 3.70 | 1,150 | 3.60 | 1,070 | 2.90 | 750 | 4.60 | 426 |
| 27 | 4.80 | 2,250 | 3.60 | 1,070 | 3.60 | 1,070 | 3.60 | 1,070 | 2.95 | 818 | 5.00 | 422 |
| 28 | 5.20 | 2,800 | 3.55 | 1,030 | 3.58 | 1,054 | 3.60 | 1,070 | 6.00 | 880 | 5.20 | 419 |
| 29 | 5.60 | 3,440 | 3.52 | 1,006 | 3.55 | 1,030 | 3.60 | 1,070 | 6.10 | 938 | 5.60 | 415 |
| 30 | 5.50 | 3,270 | 3.50 | 990 | 3.50 | 990 | 3.62 | 1,086 | 6.08 | 960 | 5.80 | 410 |
| 31 | 5.20 | 2,800 | 3.45 | 955 | ..... | ..... | 3.65 | 1,110 | ..... | ..... | 5.80 | 407 |

MONTHLY DISCHARGE of Oldman River near Macleod, for 1915.

(Drainage area 2,255 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 515 | 332 | 427 | 0.189 | 0.22 | 26,255 |
| February | 366 | 317 | 342 | 0.152 | 0.16 | 18,994 |
| March | 619 | 294 | 468 | 0.208 | 0.24 | 28,776 |
| April | 2,770 | 640 | 1,713 | 0.760 | 0.85 | 101,930 |
| May | 8,712 | 2,800 | 6,538 | 2.899 | 3.34 | 402,006 |
| June | 10,308 | 4,122 | 6,155 | 2.729 | 3.04 | 378,456 |
| July | 5,520 | 1,800 | 3,311 | 1.469 | 1.69 | 203,585 |
| August | 3,695 | 955 | 1,645 | 0.725 | 0.84 | 101,147 |
| September | 1,150 | 815 | 948 | 0.420 | 0.47 | 56,410 |
| October | 1,230 | 969 | 1,122 | 0.498 | 0.57 | 68,989 |
| November | 1,110 | 690 | 891 | 0.395 | 0.44 | 53,018 |
| December | 970 | 275 | 547 | 0.243 | 0.28 | 33,634 |
| The year | ..... | ..... | ..... | ..... | 12.14 | 1,473,200 |

CARMICHAEL DITCH NEAR STAVELY.

*Location.*—On the SE. ¼ Sec. 34, Tp. 13, Rge. 29, W. 4th Mer.
*Records available.*—July 22, 1912, to October 31, 1915.
*Gauge.*—Vertical staff.
*Bench-mark.*—On post, at elevation of 4.51 feet above zero of gauge.
*Discharge measurements.*—Made by weir.
*Observer.*—J. Carmichael.
*Remarks.*—No records were received for 1913–1914.

DISCHARGE MEASUREMENTS of Carmichael Ditch near Stavely, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| July 30 | W. R. McCaffrey | ..... | ..... | ..... | 0.208 | 0.336*a* |
| July 30 | do | ..... | ..... | ..... | 0.250 | 0.499*a* |
| July 30 | do | ..... | ..... | ..... | 0.312 | 0.684*a* |
| July 30 | do | ..... | ..... | ..... | 0.333 | 0.910*a* |

*a* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Carmichael Ditch near Stavely, for 1915.

| Day. | May. | | June. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 0.29 | 0.65 |
| 2 | ..... | ..... | 0.33 | 0.91 |
| 3 | ..... | ..... | 0.29 | 0.65 |
| 4 | ..... | ..... | 0.29 | 0.65 |
| 5 | ..... | ..... | 0.29 | 0.65 |
| 6 | ..... | ..... | 0.29 | 0.65 |
| 7 | ..... | ..... | 0.29 | 0.65 |
| 8 | ..... | ..... | 0.29 | 0.65 |
| 9 | ..... | ..... | 0.29 | 0.65 |
| 10 | ..... | ..... | 0.29 | 0.65 |
| 11 | ..... | ..... | 0.29 | 0.65 |
| 12 | ..... | ..... | 0.29 | 0.65 |
| 13 | ..... | ..... | 0.29 | 0.65 |
| 14 | ..... | ..... | 0.29 | 0.65 |
| 15 | ..... | ..... | 0.29 | 0.65 |
| 16 | ..... | ..... | 0.29 | 0.65 |
| 17 | ..... | ..... | 0.29 | 0.65 |
| 18 | ..... | ..... | 0.29 | 0.65 |
| 19 | ..... | ..... | 0.29 | 0.65 |
| 20 | ..... | ..... | 0.29 | 0.65 |
| 21 | ..... | ..... | 0.29 | 0.65 |
| 22 | ..... | ..... | 0.29 | 0.65 |
| 23 | ..... | ..... | 0.29 | 0.65 |
| 24 | ..... | ..... | 0.29 | 0.65 |
| 25 | ..... | ..... | 0.29 | 0.65 |
| 26 | ..... | ..... | 0.29 | 0.65 |
| 27 | ..... | ..... | Dry*b* | Nil. |
| 28 | 0.29*a* | 0.65 | " | " |
| 29 | 0.29 | 0.65 | " | " |
| 30 | 0.29 | 0.65 | " | " |
| 31 | 0.29 | 0.65 | ..... | .. |

*a* Headgates opened.
*b* Headgates closed for season June 27.

MONTHLY DISCHARGE of Carmichael Ditch near Stavely, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| May (28–31) | 0.65 | 0.65 | 0.65 | 5 |
| June (1–26) | 0.91 | Nil. | 0.66 | 34 |
| The period | ..... | ..... | ..... | 39 |

NOTE.—Headgates closed for season on June 27.

TROUT CREEK AT LOCKWOOD'S RANCH.

*Location.*—On SE. ¼ Sec. 32, Tp. 11, Rge. 23, W. 4th Mer.
*Records available.*—July 7, 1911, to October 31, 1915.
*Gauge.*—Vertical staff; elevation 90.30 during 1911. elevation 92.19 during 1912-15.
*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.
*Channel.*—Composed of gravel.
*Discharge measurements.*—Made by wading.
*Winter flow.*—Station not maintained during winter.
*Observer.*—Mrs. G. P. Stewart.

DISCHARGE MEASUREMENTS of Trout Creek at Lockwood's Ranch in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 16 | P. H. Daniells | 37.0 | 29.0 | 1.34 | 4.89 | 39 |
| April 1 | do | 26.0 | 19.0 | 0.77 | 3.18 | 15 |
| April 13 | do | 29.0 | 25.0 | 0.84 | 3.38 | 21 |
| April 27 | do | 30.0 | 29.0 | 1.00 | 3.55 | 30 |
| May 14 | W. R. McCaffrey | 36.0 | 69.0 | 2.50 | 4.65 | 173 |
| May 28 | do | 36.0 | 66.8 | 3.54 | 4.60 | 237 |
| June 11 | do | 35.0 | 58.3 | 3.40 | 4.34 | 198 |
| June 24 | do | 52.0 | 94.3 | 3.41 | 4.94 | 321 |
| July 10 | do | 36.5 | 75.0 | 3.92 | 4.64 | 294 |
| July 28 | do | 33.0 | 50.6 | 3.57 | 4.10 | 178 |
| Aug. 14 | do | 31.0 | 33.6 | 2.63 | 3.65 | 89 |
| Sept. 2 | do | 29.0 | 25.2 | 2.10 | 3.28 | 53 |
| Sept. 17 | do | 28.0 | 22.9 | 1.98 | 3.15 | 45 |
| Oct. 7 | W. H. Hoover | 26.5 | 19.6 | 1.64 | 3.05 | 32 |
| Oct. 23 | W. R. McCaffrey | 26.0 | 18.8 | 1.44 | 2.98 | 27 |
| Nov. 5 | do | 17.9 | 25.0 | 1.08 | 2.96 | 27 |

DAILY GAUGE HEIGHT AND DISCHARGE of Trout Creek at Lockwood's Ranch for 1915.

| Day. | April. | | May. | | June. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.30 | 18.0 | 3.83 | 53 | 4.31 | 192 |
| 2 | 3.45 | 24.0 | 4.18 | 97 | 4.37 | 203 |
| 3 | 3.55 | 30.0 | 4.42 | 133 | 4.37 | 203 |
| 4 | 3.50 | 27.0 | 4.42 | 133 | 4.40 | 208 |
| 5 | 3.42 | 23.0 | 4.44 | 136 | 4.53 | 234 |
| 6 | 3.35 | 20.0 | 4.40 | 130 | 4.47 | 222 |
| 7 | 3.37 | 21.0 | 4.42 | 133 | 4.47 | 222 |
| 8 | 3.35 | 20.0 | 4.39 | 128 | 4.49 | 226 |
| 9 | 3.32 | 18.8 | 4.35 | 122 | 4.49 | 226 |
| 10 | 3.35 | 20.0 | 4.32 | 117 | 4.49 | 226 |
| 11 | 3.40 | 22.0 | 4.27 | 110 | 4.51 | 230 |
| 12 | 3.43 | 24.0 | 4.30 | 114 | 4.51 | 230 |
| 13 | 3.49 | 26.0 | 4.36 | 124 | 4.52 | 232 |
| 14 | 3.40 | 22.0 | 4.60 | 164 | 4.55 | 238 |
| 15 | 3.40 | 22.0 | 4.93 | 227 | 4.57 | 243 |
| 16 | 3.45 | 24.0 | 4.94 | 229 | 4.57 | 243 |
| 17 | 3.47 | 26.0 | 5.11 | 265 | 4.51 | 230 |
| 18 | 3.52 | 28.0 | 5.36 | 318 | 5.01 | 336 |
| 19 | 3.52 | 28.0 | 5.23 | 290 | 4.89 | 310 |
| 20 | 3.52 | 28.0 | 5.19 | 282 | 5.04 | 343 |
| 21 | 3.55 | 30.0 | 4.97 | 236 | 5.06 | 348 |
| 22 | 3.55 | 30.0 | 5.02 | 339 | 5.05 | 346 |
| 23 | 3.57 | 31.0 | 4.95 | 323 | 5.05 | 346 |
| 24 | 3.55 | 30.0 | 4.96 | 325 | 5.04 | 343 |
| 25 | 3.55 | 30.0 | 5.00 | 334 | 5.56 | 463 |
| 26 | 3.55 | 30.0 | 4.86 | 304 | 6.62 | 707 |
| 27 | 3.54 | 29.0 | 4.81 | 293 | 5.97 | 557 |
| 28 | 3.54 | 29.0 | 4.64 | 257 | 5.86 | 532 |
| 29 | 3.54 | 29.0 | 4.66 | 262 | 5.68 | 490 |
| 30 | 3.58 | 32.0 | 4.45 | 218 | 5.41 | 428 |
| 31 | ..... | ..... | 4.35 | 199 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Trout Creek at Lockwood's Ranch, for 1915. —*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 5.40 | 426 | 4.05 | 147 | 3.30 | 53 | 3.08 | 35 |
| 2 | 5.28 | 398 | 4.00 | 139 | 3.30 | 53 | 3.12 | 38 |
| 3 | 5.19 | 378 | 3.96 | 133 | 3.30 | 53 | 3.09 | 35 |
| 4 | 5.11 | 359 | 3.95 | 131 | 3.30 | 53 | 3.05 | 32 |
| 5 | 5.06 | 348 | 3.90 | 123 | 3.30 | 53 | 3.08 | 35 |
| 6 | 5.03 | 341 | 3.85 | 116 | 3.30 | 53 | 3.08 | 35 |
| 7 | 4.99 | 332 | 3.85 | 116 | 3.26 | 49 | 3.08 | 35 |
| 8 | 4.84 | 299 | 3.85 | 116 | 3.25 | 48 | 3.08 | 35 |
| 9 | 4.80 | 291 | 3.70 | 96 | 3.35 | 58 | 3.08 | 35 |
| 10 | 4.65 | 259 | 3.70 | 96 | 3.28 | 51 | 3.10 | 36 |
| 11 | 4.60 | 249 | 3.68 | 94 | 3.25 | 48 | 3.10 | 36 |
| 12 | 4.60 | 249 | 3.65 | 90 | 3.22 | 46 | 3.09 | 35 |
| 13 | 4.50 | 228 | 3.65 | 90 | 3.18 | 42 | 3.09 | 35 |
| 14 | 4.54 | 236 | 3.65 | 90 | 3.15 | 40 | 3.10 | 36 |
| 15 | 4.52 | 232 | 3.60 | 84 | 3.15 | 40 | 3.08 | 35 |
| 16 | 5.45 | 438 | 3.60 | 84 | 3.15 | 40 | 3.08 | 35 |
| 17 | 4.85 | 302 | 3.60 | 84 | 3.14 | 39 | 3.05 | 32 |
| 18 | 4.48 | 224 | 3.65 | 90 | 3.12 | 38 | 3.04 | 32 |
| 19 | 4.42 | 212 | 4.05 | 147 | 3.12 | 38 | 3.03 | 31 |
| 20 | 4.28 | 186 | 4.42 | 212 | 3.10 | 36 | 3.03 | 31 |
| 21 | 4.18 | 169 | 3.68 | 94 | 3.10 | 36 | 3.02 | 30 |
| 22 | 4.18 | 169 | 3.60 | 84 | 3.10 | 36 | 3.00 | 29 |
| 23 | 4.12 | 158 | 3.57 | 80 | 3.22 | 46 | 2.99 | 28 |
| 24 | 4.08 | 152 | 3.50 | 72 | 3.35 | 58 | 2.99 | 28 |
| 25 | 4.10 | 155 | 3.46 | 68 | 3.20 | 44 | 2.98 | 28 |
| 26 | 4.12 | 158 | 3.40 | 62 | 3.15 | 40 | 2.97 | 27 |
| 27 | 4.02 | 142 | 3.40 | 62 | 3.15 | 40 | 2.95 | 26 |
| 28 | 4.35 | 199 | 3.36 | 58 | 3.12 | 38 | 2.95 | 26 |
| 29 | 4.12 | 158 | 3.35 | 58 | 3.10 | 36 | 2.95 | 26 |
| 30 | 4.10 | 155 | 3.35 | 58 | 3.10 | 36 | 2.94 | 25 |
| 31 | 4.05 | 147 | 3.30 | 53 | ..... | ..... | 2.94 | 25 |

MONTHLY DISCHARGE of Trout Creek at Lockwood's Ranch, for 1915.

(Drainage area 164 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| April | 32 | 18 | 26 | 0.159 | 0.18 | 1,547 |
| May | 339 | 53 | 206 | 1.256 | 1.45 | 12,666 |
| June | 707 | 192 | 312 | 1.902 | 2.12 | 18,565 |
| July | 438 | 142 | 250 | 1.524 | 1.76 | 15,371 |
| August | 212 | 53 | 97 | 0.591 | 0.68 | 5,964 |
| September | 58 | 36 | 45 | 0.274 | 0.31 | 2,678 |
| October | 38 | 25 | 32 | 0.195 | 0.22 | 1,968 |
| The period | ..... | ..... | ..... | ..... | 6.72 | 58,759 |

MUDDYPOUND CREEK AT HART'S RANCH.

*Location.*—On the SW. ¼ Sec. 27, Tp. 11, Rge. 28, W. 4th Mer., at the foot-bridge on L. O. Hart's ranch.

*Records available.*—July 27, 1908, to October 31, 1915.

*Gauge.*—Vertical staff. Zero maintained at elevation of 91.06 feet during 1908–1911. Zero maintained at elevation of 90.06 feet during 1912–1915.

*Bench-mark.*—Permanent iron bench-mark, 35 feet northeast of gauge, assumed elevation 100.00 feet.

*Channel.*—Not liable to shift.

*Discharge measurements.*—Made from bridge at high water. Made by wading at low water.

*Observer.*—Mrs. M. E. Hart.

DISCHARGE MEASUREMENTS of Muddypound Creek at Hart's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 16 | P. H. Daniells | 9.0 | 8.4 | 1.83 | 4.87 | 15.4 |
| April 1 | do | 12.5 | 9.4 | 1.09 | 2.27 | 8.0 |
| April 13 | do | 12.5 | 8.5 | 0.75 | 2.20 | 6.4 |
| April 27 | do | 12.0 | 6.0 | 0.50 | 2.06 | 3.0 |
| May 14 | W. R. McCaffrey | 14.0 | 16.2 | 1.69 | 2.82 | 27.0 |
| May 28 | do | 13.5 | 16.4 | 1.59 | 2.82 | 26.0 |
| June 11 | do | 13.0 | 14.4 | 1.33 | 2.71 | 19.0 |
| June 24 | do | 13.5 | 17.5 | 1.82 | 2.96 | 32.0 |
| July 10 | do | 13.5 | 21.0 | 1.85 | 3.20 | 38.0 |
| July 28 | do | 13.5 | 21.0 | 1.80 | 3.10 | 37.0 |
| Aug. 14 | do | 13.0 | 12.5 | 1.18 | 2.45 | 14.7 |
| Sept. 2 | do | 12.0 | 11.5 | 1.01 | 2.35 | 11.6 |
| Sept. 17 | do | 12.0 | 10.1 | 0.80 | 2.30 | 8.9 |
| Oct. 7 | W. H. Hannon | 8.0 | 4.2 | 1.76 | 2.29 | 7.4 |
| Oct. 23 | W. R. McCaffrey | 8.5 | 4.1 | 1.54 | 2.34 | 6.3 |

DAILY GAUGE HEIGHT AND DISCHARGE of Muddypound Creek at Hart's Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height | Discharge. |
| | *Feet.* | *Sec.-ft* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.28 | 8.2 | 2.26 | 7.7 | 2.71 | 21.0 |
| 2 | ..... | ..... | 2.34 | 9.8 | 2.38 | 10.9 | 2.77 | 23.0 |
| 3 | ..... | ..... | 3.42 | 51.0 | 2.24 | 7.2 | 2.79 | 23.0 |
| 4 | ..... | ..... | 2.28 | 8.2 | 2.24 | 7.2 | 2.76 | 22.0 |
| 5 | ..... | ..... | 2.20 | 6.2 | 2.25 | 7.4 | 2.73 | 21.0 |
| 6 | ..... | ..... | 2.19 | 6.0 | 2.25 | 7.4 | 2.69 | 20.0 |
| 7 | ..... | ..... | 2.18 | 5.7 | 2.25 | 7.4 | 2.79 | 23.0 |
| 8 | ..... | ..... | 2.16 | 5.2 | 2.25 | 7.4 | 2.72 | 21.0 |
| 9 | ..... | ..... | 2.16 | 5.2 | 2.25 | 7.4 | 2.67 | 19.4 |
| 10 | ..... | ..... | 2.15 | 5.0 | 2.25 | 7.4 | 2.62 | 17.8 |
| 11 | ..... | ..... | 2.15 | 5.0 | 2.25 | 7.4 | 2.73 | 21.0 |
| 12 | ..... | ..... | 2.15 | 5.0 | 2.25 | 7.4 | 2.67 | 19.4 |
| 13 | ..... | ..... | 2.18 | 5.7 | 2.30 | 8.7 | 2.66 | 19.1 |
| 14 | ..... | ..... | 2.20 | 6.2 | 2.70 | 20.0 | 2.86 | 26.0 |
| 15 | ..... | ..... | 2.18 | 5.7 | 2.68 | 19.7 | 2.93 | 28.0 |
| 16 | 4.91 | 24.0*a* | 2.17 | 5.5 | 2.74 | 22.0 | 2.81 | 24.0 |
| 17 | 4.57 | 40.0 | 2.17 | 5.5 | 2.78 | 23.0 | 2.86 | 26.0 |
| 18 | 4.09 | 50.0 | 2.16 | 5.2 | 2.90 | 27.0 | 3.01 | 32.0 |
| 19 | 3.49 | 38.0 | 2.13 | 4.5 | 2.90 | 27.0 | 3.04 | 33.0 |
| 20 | 3.39 | 34.0 | 2.11 | 4.0 | 2.90 | 27.0 | 2.99 | 31.0 |
| 21 | 3.09 | 16.0 | 2.10 | 3.8 | 2.96 | 30.0 | 2.93 | 28.0 |
| 22 | 2.44 | 12.0 | 2.10 | 3.8 | 3.02 | 32.0 | 2.99 | 31.0 |
| 23 | 2.34 | 11.0 | 2.10 | 3.8 | 3.01 | 32.0 | 3.01 | 32.0 |
| 24 | 2.29 | 8.0 | 2.10 | 3.8 | 3.00 | 31.0 | 2.97 | 30.0 |
| 25 | 2.27 | 8.0*a* | 2.10 | 3.8 | 2.98 | 30.0 | 4.23 | 93.0 |
| 26 | 2.25 | 7.4 | 2.07 | 3.2 | 2.86 | 26.0 | 4.11 | 87.0 |
| 27 | 2.20 | 6.2 | 2.05 | 2.8 | 2.86 | 26.0 | 3.65 | 63.0 |
| 28 | 2.20 | 6.2 | 2.05 | 2.8 | 2.85 | 26.0 | 3.61 | 61.0 |
| 29 | 2.14 | 4.8 | 2.05 | 2.8 | 2.77 | 23.0 | 4.11 | 87.0 |
| 30 | 2.13 | 4.5 | 2.05 | 2.8 | 2.72 | 21.0 | 3.63 | 62.0 |
| 31 | 2.16 | 5.2 | ..... | ..... | 2.71 | 21.0 | ..... | ..... |

*a*–*a* Estimated.

DAILY GAUGE HEIGHT AND DISCHARGE of Muddypound Creek at Hart's Ranch, for 1915.
—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.64 | 62.0 | 2.62 | 17.8 | 2.50 | 14.2 | 2.29 | 8.4 |
| 2 | 3.60 | 60.0 | 2.64 | 18.4 | 2.38 | 10.9 | 2.29 | 8.4 |
| 3 | 3.50 | 55.0 | 2.62 | 17.8 | 2.34 | 9.8 | 2.30 | 8.7 |
| 4 | 3.46 | 53.0 | 2.62 | 17.8 | 2.34 | 9.8 | 2.30 | 8.7 |
| 5 | 3.42 | 51.0 | 2.60 | 17.2 | 2.34 | 9.8 | 2.30 | 8.7 |
| 6 | 3.42 | 51.0 | 2.59 | 16.9 | 2.34 | 9.8 | 2.35 | 10.0 |
| 7 | 3.42 | 51.0 | 2.59 | 16.9 | 2.32 | 9.2 | 2.28 | 8.2 |
| 8 | 3.42 | 51.0 | 2.59 | 16.9 | 2.32 | 9.2 | 2.28 | 8.2 |
| 9 | 3.34 | 47.0 | 2.58 | 16.6 | 2.32 | 9.2 | 2.28 | 8.2 |
| 10 | 3.20 | 40.0 | 2.56 | 16.0 | 2.30 | 8.7 | 2.30 | 8.7 |
| 11 | 3.13 | 37.0 | 2.55 | 15.7 | 2.29 | 8.4 | 2.28 | 8.2 |
| 12 | 3.08 | 35.0 | 2.54 | 15.4 | 2.29 | 8.4 | 2.28 | 8.2 |
| 13 | 3.06 | 34.0 | 2.53 | 15.1 | 2.29 | 8.4 | 2.27 | 8.0 |
| 14 | 3.06 | 34.0 | 2.52 | 14.8 | 2.29 | 8.4 | 2.27 | 8.0 |
| 15 | 3.05 | 33.0 | 2.51 | 14.5 | 2.29 | 8.4 | 2.27 | 8.0 |
| 16 | 3.04 | 33.0 | 2.51 | 14.5 | 2.29 | 8.4 | 2.27 | 8.0 |
| 17 | 3.03 | 32.0 | 2.51 | 14.5 | 2.29 | 8.4 | 2.26 | 7.7 |
| 18 | 3.02 | 32.0 | 2.51 | 14.5 | 2.29 | 8.4 | 2.26 | 7.7 |
| 19 | 2.11 | 4.0 | 2.51 | 14.5 | 2.29 | 8.4 | 2.26 | 7.7 |
| 20 | 2.09 | 3.6 | 5.80 | 175.0 | 2.29 | 8.4 | 2.26 | 7.7 |
| 21 | 2.06 | 3.0 | 2.71 | 21.0 | 2.29 | 8.4 | 2.25 | 7.4 |
| 22 | 2.33 | 9.5 | 2.60 | 17.2 | 2.29 | 8.4 | 2.24 | 7.2 |
| 23 | 2.94 | 29.0 | 2.55 | 15.7 | 2.32 | 9.2 | 2.24 | 7.2 |
| 24 | 2.72 | 21.0 | 2.54 | 15.4 | 2.38 | 10.9 | 2.23 | 7.0 |
| 25 | 2.54 | 15.4 | 2.53 | 15.1 | 2.32 | 9.2 | 2.23 | 4.0 |
| 26 | 2.52 | 14.8 | 2.52 | 14.8 | 2.29 | 8.4 | 2.22 | 6.7 |
| 27 | 2.91 | 28.0 | 2.51 | 14.5 | 2.29 | 8.4 | 2.22 | 6.7 |
| 28 | 3.34 | 47.0 | 2.50 | 14.2 | 2.29 | 8.4 | 2.22 | 6.7 |
| 29 | 2.87 | 26.0 | 2.50 | 14.2 | 2.29 | 8.4 | 2.21 | 6.4 |
| 30 | 2.66 | 19.1 | 2.50 | 14.2 | 2.29 | 8.4 | 2.21 | 6.4 |
| 31 | 2.63 | 18.1 | 2.50 | 14.2 | ..... | ..... | 2.20 | 6.2 |

MONTHLY DISCHARGE of Muddypound Creek at Hart's Ranch, for 1915.

(Drainage area 44 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (16-31) | 50.0 | 4.5 | 17.2 | 0.391 | 0.23 | 546 |
| April | 51.0 | 2.8 | 6.5 | 0.148 | 0.17 | 387 |
| May | 32.0 | 7.2 | 18.3 | 0.416 | 0.48 | 1,125 |
| June | 93.0 | 17.8 | 35.0 | 0.796 | 0.89 | 2,082 |
| July | 62.0 | 3.0 | 33.0 | 0.750 | 0.86 | 2,029 |
| August | 175.0 | 14.2 | 21.0 | 0.478 | 0.55 | 1,291 |
| September | 14.2 | 8.4 | 9.1 | 0.207 | 0.23 | 541 |
| October | 10.0 | 4.0 | 7.6 | 0.173 | 0.20 | 467 |
| The period | ..... | ..... | ..... | ..... | 3.61 | 8,468 |

WILLOW CREEK AT CONNOLLY'S RANCH.

*Location.*—On the NE. ¼ Sec. 20, Tp. 9, Rge. 26, W. 4th Mer.
*Records available.*—August 13, 1915, to December 31, 1915.
*Gauge.*—Vertical staff.
*Bench-marks.*—Temporary. (1) On post of gateway near barn. Elevation, 10.35 feet above zero of gauge. (2) Nail driven in corner of barn. Elevation, 9.90 feet above zero of gauge.
*Channel.*—One channel except at very high stages; clean gravel and sand bottom.
*Discharge measurements.*—Made from bridge, except at low water.
*Observer.*—J. Connolly.

DISCHARGE MEASUREMENTS of Willow Creek at Connolly's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Aug. 13 | G. W. Whyte and W. R. McCaffrey | 110 | 192 | 1.99 | 2.06 | 382 |
| Aug. 26 | W. R. McCaffrey | 101 | 172 | 1.75 | 1.91 | 300 |
| Sept. 15 | do | 71 | 138 | 1.52 | 1.63 | 211 |
| Oct. 4 | do | 70 | 140 | 1.49 | 1.58 | 209 |
| Nov. 4 | do | 70 | 113 | 1.22 | 1.39 | 138 |
| Nov. 18 | do | 43 | 40 | 2.77 | 1.30 | 110 |
| Dec. 2 | do | 43.5 | 49 | 1.58 | 1.20 | 78 |
| Dec. 16 | do | 67 | 90 | 1.01 | 1.08 | 90 |

DAILY GAUGE HEIGHT AND DISCHARGE of Willow Creek at Connolly's Ranch, for 1915.

| Day. | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.00 | 345 | 1.48 | 168 | 1.34 | 127 | 1.18 | 90 |
| 2 | ..... | ..... | 2.00 | 345 | 1.98 | 338 | 1.34 | 127 | 1.23 | 101 |
| 3 | ..... | ..... | 2.00 | 345 | 1.57 | 196 | 1.34 | 127 | 1.23 | 101 |
| 4 | ..... | ..... | 2.04 | 360 | 1.66 | 226 | 1.37 | 135 | 1.23 | 101 |
| 5 | ..... | ..... | 2.00 | 345 | 1.62 | 213 | 1.39 | 140 | 1.28 | 112 |
| 6 | ..... | ..... | 2.00 | 345 | 1.58 | 200 | 1.38 | 138 | 1.23 | 101 |
| 7 | ..... | ..... | 2.00 | 345 | 1.63 | 216 | 1.34 | 127 | 1.38 | 138 |
| 8 | ..... | ..... | 2.00 | 345 | 1.63 | 216 | 1.32 | 122 | 1.36 | 133 |
| 9 | ..... | ..... | 2.04 | 360 | 1.58 | 200 | 1.29 | 115 | 1.33 | 125 |
| 10 | ..... | ..... | 2.04 | 360 | 1.63 | 216 | 1.36 | 133 | 1.33 | 125 |
| 11 | ..... | ..... | 2.09 | 378 | 1.63 | 216 | 1.29 | 115 | 1.28 | 112 |
| 12 | ..... | ..... | 2.09 | 378 | 1.61 | 209 | 1.29 | 115 | 1.28 | 112 |
| 13 | 2.06 | 367 | 2.09 | 378 | 1.63 | 216 | 1.45 | 159 | 1.28 | 112 |
| 14 | 2.10 | 382 | 2.05 | 363 | 1.63 | 216 | 1.45 | 159 | 1.23 | 101 |
| 15 | 2.06 | 367 | 1.65 | 222 | 1.63 | 216 | 1.45 | 159 | 1.18 | 90 |
| 16 | 2.04 | 360 | 2.03 | 356 | 1.63 | 216 | 1.30 | 117 | 1.21 | 96 |
| 17 | 2.04 | 360 | 2.03 | 356 | 1.61 | 209 | 1.40 | 143 | 1.22 | 99 |
| 18 | 2.07 | 371 | 1.69 | 236 | 1.48 | 168 | 1.43 | 152 | 1.33 | 125 |
| 19 | 4.09 | 1,177 | 1.51 | 177 | 1.47 | 165 | 1.67 | 229 | 1.28 | 112 |
| 20 | 3.03 | 752 | 1.56 | 193 | 1.38 | 138 | 1.71 | 242 | 1.23 | 101 |
| 21 | 3.10 | 781 | 1.53 | 184 | 1.38 | 138 | 1.41 | 146 | 1.19 | 92 |
| 22 | 2.40 | 501 | 1.53 | 184 | 1.51 | 177 | 1.41 | 146 | 1.18 | 90 |
| 23 | 2.40 | 501 | 1.54 | 187 | 1.47 | 165 | 1.41 | 146 | 1.23 | 101 |
| 24 | 2.06 | 367 | 1.54 | 187 | 1.48 | 168 | 1.41 | 146 | 1.28 | 112 |
| 25 | 2.06 | 367 | 1.83 | 283 | 1.46 | 162 | 1.41 | 146 | 1.33 | 125 |
| 26 | 2.00 | 345 | 1.81 | 277 | 1.49 | 171 | 1.37 | 135 | 1.23 | 101 |
| 27 | 2.09 | 378 | 1.58 | 200 | 1.44 | 155 | 1.22 | 99 | 1.33 | 125 |
| 28 | 2.09 | 378 | 1.55 | 190 | 1.41 | 146 | 1.42 | 149 | 1.23 | 101 |
| 29 | 2.09 | 378 | 1.53 | 184 | 1.40 | 143 | 1.32 | 122 | 1.18 | 90 |
| 30 | 2.00 | 345 | 1.53 | 184 | 1.40 | 143 | 1.22 | 99 | 1.23 | 101 |
| 31 | 2.00 | 345 | ..... | ..... | 1.36 | 133 | ..... | ..... | 1.03 | 63 |

MONTHLY DISCHARGE of Willow Creek at Connolly's Ranch, for 1915.

(Drainage area 1,006 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| August (13-31) | 1,177 | 345 | 464 | 0.461 | 0.33 | 17,486 |
| September | 378 | 177 | 286 | 0.284 | 0.32 | 17,018 |
| October | 338 | 133 | 189 | 0.188 | 0.22 | 11,621 |
| November | 242 | 99 | 140 | 0.139 | 0.16 | 8,331 |
| December | 138 | 63 | 106 | 0.105 | 0.12 | 6,518 |
| The period | ..... | ..... | ..... | ..... | 1.15 | 60,974 |

WILLOW CREEK NEAR MACLEOD.

*Location.*——On the SE. ¼ Sec. 26, Tp. 9, Rge. 26, W. 4th Mer.

*Records available.*—July 1, 1909, to August 31, 1915.

*Gauge.*—Vertical staff. Zero of gauge maintained at 90.84 feet during 1910–15.

*Bench-mark.*—Permanent iron bench-mark located 39 feet northwest of the gauge. Assumed elevation, 100.00 feet.

*Channel.*—Consists of clean gravel and is not liable to shift.

*Discharge measurements.*—Made from bridge during flood stages and by wading at low stages.

*Observer.*—Hugh McLean.

*Remarks.*—A new station was established on this stream at Conolly's ranch about 6 miles upstream on August 13, 1915, to replace this station.

DISCHARGE MEASUREMENTS of Willow Creek near Macleod, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 31 | P. H. Daniells | 60.0 | 88 | 1.23 | 2.30 | 108 |
| April 13 | do | 61.0 | 92 | 1.25 | 2.33 | 115 |
| April 26 | do | 71.0 | 105 | 1.47 | 2.58 | 154 |
| May 11 | W. R. McCaffrey | 99.0 | 217 | 2.65 | 3.86 | 576 |
| May 29 | do | 101.0 | 303 | 3.31 | 4.70 | 1,004 |
| June 10 | do | 101.0 | 290 | 3.36 | 4.63 | 973 |
| June 23 | do | 102.0 | 355 | 3.98 | 5.44 | 1,416 |
| June 26 | do | 140.0 | 760 | 5.20 | 9.28 | 3,952a |
| July 9 | do | 103.0 | 350 | 4.29 | 5.56 | 1,499 |
| July 27 | do | 98.5 | 244 | 3.16 | 4.37 | 771 |
| Aug. 26 | do | 87.0 | 148 | 2.40 | 3.28 | 355 |
| Oct. 4 | do | 100.0 | 108 | 1.84 | 2.80 | 197 |
| Oct. 22 | do | 71.0 | 126 | 1.42 | 1.53 | 179 |

a Flood. Slope determination.

DAILY GAUGE HEIGHT AND DISCHARGE of Willow Creek near Macleod, for 1915.

| Day. | March. | | April. | | May. | | June. | | July. | | August. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.30 | 108 | 2.44 | 128 | 4.28 | 773 | 6.44 | 2,012 | 4.43 | 855 |
| 2 | ..... | ..... | 2.35 | 115 | 2.59 | 154 | 4.28 | 773 | 6.34 | 1,950 | 4.45 | 867 |
| 3 | ..... | ..... | 2.40 | 122 | 4.99 | 1,166 | 4.93 | 1,133 | 6.29 | 1,919 | 4.40 | 839 |
| 4 | ..... | ..... | 2.42 | 125 | 4.64 | 971 | 4.91 | 1,122 | 5.89 | 1,680 | 4.35 | 812 |
| 5 | ..... | ..... | 2.45 | 130 | 4.29 | 778 | 4.88 | 1,105 | 5.89 | 1,680 | 4.20 | 729 |
| 6 | ..... | ..... | 2.60 | 156 | 4.29 | 778 | 4.88 | 1,105 | 6.10 | 1,804 | 4.10 | 674 |
| 7 | ..... | ..... | 2.65 | 166 | 4.26 | 762 | 4.93 | 1,133 | 6.15 | 1,834 | 4.04 | 642 |
| 8 | ..... | ..... | 2.50 | 138 | 4.24 | 751 | 4.93 | 1,133 | 6.15 | 1,834 | 3.98 | 610 |
| 9 | ..... | ..... | 2.50 | 138 | 4.24 | 751 | 4.88 | 1,105 | 5.35 | 1,368 | 3.92 | 580 |
| 10 | ..... | ..... | 2.45 | 130 | 3.89 | 565 | 4.78 | 1,049 | 5.20 | 1,284 | 3.70 | 477 |
| 11 | ..... | ..... | 2.35 | 115 | 3.84 | 541 | 4.69 | 998 | 5.16 | 1,262 | 3.62 | 444 |
| 12 | ..... | ..... | 2.31 | 109 | 3.89 | 565 | 4.69 | 998 | 4.93 | 1,133 | 3.55 | 418 |
| 13 | ..... | ..... | 2.33 | 112 | 3.89 | 565 | 4.64 | 971 | 4.74 | 1,026 | 3.50 | 399 |
| 14 | ..... | ..... | 2.40 | 122 | 3.99 | 615 | 5.09 | 1,222 | 4.76 | 1,038 | 3.48 | 392 |
| 15 | ..... | ..... | 2.40 | 122 | 6.10 | 1,804 | 5.09 | 1,222 | 4.90 | 1,116 | 3.45 | 382 |
| 16 | ..... | ..... | 2.43 | 127 | 5.49 | 1,446 | 5.19 | 1,278 | 5.14 | 1,194 | 3.45 | 382 |
| 17 | ..... | ..... | 2.45 | 130 | 5.34 | 1,362 | 5.24 | 1,306 | 5.00 | 1,172 | 3.45 | 382 |
| 18 | ..... | ..... | 2.48 | 135 | 5.24 | 1,306 | 5.14 | 1,250 | 4.93 | 1,133 | 3.45 | 382 |
| 19 | ..... | ..... | 2.48 | 135 | 5.24 | 1,306 | 6.40 | 1,987 | 4.60 | 949 | 5.10 | 1,228 |
| 20 | ..... | ..... | 2.49 | 136 | 5.19 | 1,278 | 7.04 | 2,403 | 4.55 | 922 | 4.65 | 977 |
| 21 | ..... | ..... | 2.49 | 136 | 5.28 | 1,329 | 6.60 | 2,114 | 4.46 | 872 | 4.40 | 839 |
| 22 | 2.91 | 223 | 2.49 | 136 | 5.33 | 1,357 | 6.15 | 1,834 | 4.35 | 812 | 4.08 | 663 |
| 23 | 2.81 | 199 | 2.47 | 133 | 5.33 | 1,357 | 5.69 | 1,562 | 4.35 | 812 | 3.63 | 448 |
| 24 | 3.16 | 291 | 2.45 | 130 | 5.33 | 1,357 | 5.54 | 1,475 | 4.33 | 800 | 3.50 | 399 |
| 25 | 3.11 | 277 | 2.45 | 130 | 5.33 | 1,357 | 7.00 | 2,377 | 4.50 | 894 | 3.35 | 348 |
| 26 | 3.06 | 263 | 2.47 | 133 | 5.28 | 1,329 | 9.28 | 3,959 | 4.45 | 867 | 3.20 | 302 |
| 27 | 2.86 | 211 | 2.47 | 133 | 5.13 | 1,245 | 8.57 | 3,449 | 4.45 | 867 | 3.16 | 291 |
| 28 | 2.68 | 172 | 2.50 | 138 | 4.88 | 1,105 | 7.86 | 2,952 | 4.50 | 894 | 3.12 | 280 |
| 29 | 2.64 | 164 | 2.44 | 128 | 4.70 | 1,004 | 7.15 | 2,476 | 4.63 | 965 | 3.10 | 274 |
| 30 | 2.61 | 158 | 2.42 | 125 | 4.58 | 938 | 6.45 | 2,019 | 4.75 | 1,032 | 3.05 | 260 |
| 31 | 2.30 | 108 | ..... | ..... | 4.43 | 855 | ..... | ..... | 4.50 | 894 | 3.03 | 254 |

MONTHLY DISCHARGE of Willow Creek near Macleod, for 1915.

(Drainage area 1,013 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (22–31) | 291 | 108 | 207 | 0.204 | 0.08 | 4,106 |
| April | 166 | 108 | 130 | 0.128 | 0.14 | 7,736 |
| May | 1,804 | 128 | 994 | 0.981 | 1.13 | 61,119 |
| June | 3,959 | 773 | 1,609 | 1.588 | 1.77 | 95,743 |
| July | 2,012 | 800 | 1,226 | 1.210 | 1.40 | 75,384 |
| August | 1,228 | 254 | 543 | 0.536 | 0.62 | 33,388 |
| The period | ..... | ..... | ..... | ..... | 5.14 | 277,476 |

OLDMAN (BELLY) RIVER NEAR LETHBRIDGE.

*Location.*—On the traffic bridge on the NW. ¼ Sec. 1, Tp. 9, Rge. 22, W. 4th Mer.

*Records available.*—August 31, 1911, to December 31, 1915.

*Gauge.*—Chain gauge. Elevation of zero maintained at 87.82 feet during 1911–12; 85.70 feet during 1913–15.

*Bench-mark.*—Top of arrow marked with white paint on the right abutment. Assumed elevation, 100.00 feet.

*Discharge measurements.*—Made from downstream side of the traffic bridge.

*Winter flow.*—Obtained through the ice one-half mile below the traffic bridge.

*Observer.*—Wm. Bedster.

DISCHARGE MEASUREMENTS of Oldman (Belly) River near Lethbridge, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 13 | O. H. Hoover | 175 | 714 | 1.40 | 3.47 | 997 |
| Jan. 26 | W. A. Burton | 158 | 649 | 1.12 | 3.09 | 725 |
| Feb. 13 | J. E. Degnan | 147 | 606 | 1.21 | 3.38 | 731 |
| Mar. 4 | do | 141 | 582 | 1.15 | 3.08 | 670 |
| Mar. 17 | P. H. Daniells | 365 | 1,783 | 2.26 | 4.85 | 4,032 |
| April 5 | do | 355 | 1,609 | 1.89 | 3.66 | 3,043 |
| April 14 | do | 348 | 1,551 | 1.72 | 3.34 | 2,677 |
| April 29 | do | 380 | 1,806 | 2.25 | 4.21 | 4,057 |
| May 12 | W. R. McCaffrey | 491 | 3,222 | 3.75 | 7.00 | 12,096 |
| May 25 | do | 491 | 2,998 | 3.48 | 6.71 | 10,440 |
| June 7 | do | 493 | 3,616 | 4.33 | 7.95 | 15,646 |
| June 21 | do | 464 | 3,563 | 4.57 | 8.36 | 16,288 |
| June 26 | J. E. Degnan | 589 | 4,401 | 5.21 | 9.55 | 22,965 |
| June 28 | do | 495 | 4,314 | 4.91 | 9.36 | 21,174 |
| June 30 | do | 582 | 3,661 | 4.29 | 8.16 | 15,689 |
| July 12 | W. R. McCaffrey | 446 | 2,656 | 3.05 | 6.05 | 8,112 |
| July 24 | do | 384 | 2,268 | 2.74 | 5.15 | 6,204 |
| Aug. 10 | do | 374 | 2,111 | 2.48 | 4.71 | 5,240 |
| Aug. 23 | do | 374 | 2,052 | 2.27 | 4.68 | 4,656 |
| Sept. 22 | do | 366 | 1,864 | 1.94 | 4.02 | 3,622 |
| Oct. 9 | do | 370 | 2,006 | 2.12 | 4.28 | 4,264 |
| Oct. 26 | do | 352 | 1,681 | 1.86 | 3.79 | 3,124 |
| Nov. 23 "a" | W. H. Storey | ..... | ..... | ..... | 2.82 | ..... |
| Dec. 16 | do | 320 | 1,166 | 0.81 | 2.28 | 950 |

*a* Measurement impossible owing to slush ice.

DAILY GAUGE HEIGHT AND DISCHARGE of Oldman (Belly) River near Lethbridge, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.97 | 1,283 | 3.24 | 693 | 3.25 | 683 | 2.55 | 1,730 | 4.35 | 4,280 | 6.25 | 8,990 |
| 2 | 3.98 | 1,244 | 3.31 | 716 | 3.25 | 679 | 2.76 | 1,940 | 5.90 | 8,010 | 6.29 | 9,110 |
| 3 | 3.98 | 1,180 | 3.33 | 722 | 3.15 | 676 | 2.80 | 1,980 | 6.25 | 8,990 | 6.40 | 9,440 |
| 4 | 3.94 | 1,120 | 3.36 | 729 | 3.07 | 670 | 3.50 | 2,810 | 7.15 | 11,935 | 7.09 | 11,714 |
| 5 | 3.95 | 1,060 | 3.39 | 732 | 3.03 | 662 | 3.66 | 3,046 | 6.74 | 10,502 | 8.33 | 16,669 |
| 6 | 3.90 | 1,035 | 3.36 | 736 | 3.00 | 655 | 3.85 | 3,355 | 5.51 | 6,957 | 8.30 | 16,540 |
| 7 | 3.82 | 1,035 | 3.35 | 738 | 2.96 | 646 | 4.00 | 3,610 | 6.15 | 8,700 | 7.86 | 14,672 |
| 8 | 3.73 | 1,046 | 3.35 | 738 | 3.03 | 642 | 3.70 | 3,110 | 6.16 | 8,728 | 7.74 | 14,174 |
| 9 | 3.80 | 1,059 | 3.34 | 736 | 3.03 | 647 | 3.35 | 2,610 | 6.20 | 8,840 | 7.64 | 13,776 |
| 10 | 3.81 | 1,060 | 3.37 | 733 | 2.86 | 660 | 2.90 | 2,090 | 6.65 | 10,210 | 7.54 | 13,392 |
| 11 | 3.72 | 1,053 | 3.37 | 730 | 2.88 | 675 | 3.18 | 2,407 | 7.16 | 11,972 | 7.39 | 12,823 |
| 12 | 3.71 | 1,030 | 3.37 | 729 | 2.84 | 690 | 3.05 | 2,258 | 7.21 | 12,157 | 7.16 | 11,972 |
| 13 | 3.54 | 997 | 3.39 | 731 | 2.84 | 716 | 3.11 | 2,327 | 6.80 | 10,700 | 7.16 | 11,972 |
| 14 | 3.43 | 965 | 3.47 | 746 | 2.68 | 763 | 3.35 | 2,610 | 6.70 | 10,370 | 7.42 | 12,936 |
| 15 | 3.47 | 900 | 3.33 | 766 | 2.85 | 806 | 3.60 | 2,950 | 7.80 | 14,420 | 7.47 | 13,126 |
| 16 | 3.33 | 850 | 3.25 | 764 | 2.95 | 960 | 3.51 | 2,824 | 7.89 | 14,798 | 7.41 | 12,898 |
| 17 | 3.11 | 855 | 3.24 | 743 | 4.86 | 4,032 | 3.70 | 3,110 | 7.50 | 13,240 | 7.96 | 15,092 |
| 18 | 3.12 | 881 | 3.23 | 720 | 4.83 | 4,600 | 4.15 | 3,895 | 7.35 | 12,675 | 8.17 | 15,981 |
| 19 | 3.14 | 890 | 3.30 | 706 | 4.80 | 5,100 | 4.36 | 4,300 | 7.70 | 14,010 | 8.64 | 18,030 |
| 20 | 3.19 | 880 | 3.32 | 697 | 5.20 | 6,160 | 4.56 | 4,712 | 7.43 | 12,974 | 8.63 | 17,985 |
| 21 | 3.25 | 850 | 3.35 | 696 | 4.05 | 3,705 | 4.67 | 4,954 | 6.94 | 11,180 | 8.27 | 16,411 |
| 22 | 3.26 | 800 | 3.31 | 697 | 4.05 | 3,705 | 4.72 | 5,064 | 6.73 | 10,469 | 7.74 | 14,174 |
| 23 | 3.22 | 775 | 3.31 | 700 | 4.30 | 4,180 | 4.82 | 5,286 | 6.55 | 9,895 | 7.31 | 12,527 |
| 24 | 3.21 | 754 | 3.32 | 708 | 4.50 | 4,580 | 4.87 | 5,401 | 6.57 | 9,957 | 7.24 | 12,268 |
| 25 | 3.20 | 734 | 3.25 | 708 | 3.40 | 2,670 | 4.53 | 4,646 | 6.71 | 10,403 | 7.67 | 13,893 |
| 26 | 3.10 | 725 | 3.22 | 705 | 2.55 | 1,730 | 4.43 | 4,440 | 6.70 | 10,370 | 8.86 | 19,026 |
| 27 | 3.20 | 710 | 3.25 | 698 | 2.58 | 1,760 | 4.31 | 4,200 | 6.65 | 10,210 | 9.49 | 22,100 |
| 28 | 3.20 | 668 | 3.19 | 690 | 2.50 | 1,680 | 4.27 | 4,143 | 6.55 | 9,895 | 8.91 | 19,257 |
| 29 | 3.20 | 645 | ..... | ..... | 2.78 | 1,960 | 4.31 | 4,200 | 6.47 | 9,650 | 8.35 | 16,755 |
| 30 | 3.21 | 648 | ..... | ..... | 2.71 | 1,890 | 4.33 | 4,240 | 6.44 | 9,560 | 8.04 | 15,428 |
| 31 | 3.20 | 666 | ..... | ..... | 2.65 | 1,830 | | | 6.40 | 9,440 | | |

DAILY GAUGE HEIGHT AND DISCHARGE of Oldman (Belly) River near Lethbridge, for 1915. —*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 7.85 | 14,630 | 6.14 | 8,672 | 3.43 | 2,712 | 3.63 | 2,998 | 3.73 | 3,158 | 2.15 | 1,040 |
| 2 | 8.10 | 15,680 | 6.09 | 8,532 | 3.48 | 2,782 | 3.55 | 2,880 | 3.72 | 3,142 | 2.10 | 1,023 |
| 3 | 7.70 | 14,010 | 5.99 | 8,253 | 3.62 | 2,982 | 3.56 | 2,894 | 3.70 | 3,110 | 2.07 | 1,025 |
| 4 | 7.69 | 13,971 | 5.76 | 8,132 | 3.76 | 3,206 | 3.77 | 3,222 | 3.66 | 3,046 | 2.02 | 1,040 |
| 5 | 7.63 | 13,737 | 5.48 | 6,878 | 4.59 | 4,778 | 4.02 | 3,648 | 3.63 | 2,998 | 2,90. | 1,068 |
| 6 | 6.93 | 11,145 | 5.14 | 6,022 | 4.15 | 3,895 | 4.25 | 4,085 | 3.58 | 2,922 | 2.82 | 1,073 |
| 7 | 6.84 | 10,836 | 5.02*a* | 5,746 | 3.95 | 3,525 | 4.26 | 4,104 | 3.54 | 2,866 | 2.80 | 1,070 |
| 8 | 6.76 | 10,568 | 4.90 | 5,470 | 3.81 | 3,287 | 4.33 | 4,240 | 3.52 | 2,838 | 2.75 | 1,060 |
| 9 | 6.63 | 10,146 | 4.77 | 5,174 | 3.70 | 3,110 | 4.31 | 4,200 | 3.51 | 2,824 | 2.77 | 1,050 |
| 10 | 6.50 | 9,740 | 4.72 | 5,064 | 3.64 | 3,014 | 4.33 | 4,240 | 3.37 | 2,634 | 2.80 | 1,034 |
| 11 | 6.22 | 8,900 | 4.57 | 4,734 | 3.71 | 3,126 | 4.23 | 4,047 | 3.20 | 2,400 | 2.77 | 1,010 |
| 12 | 5.96 | 8,172 | 4.44 | 4,460 | 3.95 | 3,525 | 4.23 | 4,047 | 3.10 | 2,200 | 2.76 | 990 |
| 13 | 5.79 | 7,713 | 4.34 | 4,260 | 3.83 | 3,321 | 4.20 | 3,990 | 2.90 | 2,095 | 2.73 | 972 |
| 14 | 5.65 | 7,335 | 4.32 | 4,240 | 3.70 | 3,110 | 4.25 | 4,085 | 2.70 | 2,010 | 2.72 | 960 |
| 15 | 5.46 | 6,826 | 4.34 | 4,260 | 3.61 | 2,966 | 4.21 | 4,009 | 2.90 | 1,955 | 2.39 | 955 |
| 16 | 5.34 | 6,514 | 4.23 | 4,047 | 3.54 | 2,866 | 4.20 | 3,990 | 3.00 | 1,900 | 2.28 | 950 |
| 17 | 5.37 | 6,592 | 4.30 | 4,180 | 3.50 | 2,810 | 4.17 | 3,933 | 3.21 | 1,855 | 2.22 | 940 |
| 18 | 5.44 | 6,774 | 4.35 | 4,280 | 3.61 | 2,966 | 4.08 | 3,762 | 3.19 | 1,800 | 2.19 | 897 |
| 19 | 6.44 | 6,774 | 4.50 | 4,580 | 3.75 | 3,190 | 3.96 | 3,542 | 3.20 | 1,755 | 2.15 | 876 |
| 20 | 5.94 | 8,118 | 4.72 | 5,064 | 3.88 | 3,406 | 3.96 | 3,542 | 3.15 | 1,710 | 2.27 | 880 |
| 21 | 5.54 | 7,038 | 5.50 | 6,930 | 4.08 | 3,762 | 3.95 | 3,525 | 2.75 | 1,660 | 2.49 | 893 |
| 22 | 5.36 | 6,566 | 5.30 | 6,410 | 4.00 | 3,610 | 3.93 | 3,491 | 2.78 | 1,590 | 2,78 | 913 |
| 23 | 5.17 | 6,091 | 4.70 | 5,020 | 3.94 | 3,508 | 3.90 | 3,440 | 2.86 | 1,520 | 3.10 | 937 |
| 24 | 5.19 | 6,137 | 4.40 | 4,380 | 3.95 | 3,525 | 3.82 | 3,304 | 2.95 | 1,450 | 3.14 | 952 |
| 25 | 5.33 | 6,488 | 4.23 | 4,047 | 3.90 | 3,440 | 3.77 | 3,232 | 2.72 | 1,390 | 3.15 | 966 |
| 26 | 5.13 | 5,999 | 4.11 | 3,819 | 4.00 | 3,610 | 3.79 | 3,094 | 2.54 | 1,330 | 3.10 | 982 |
| 27 | 5.09 | 5,907 | 3.93 | 3,491 | 4.02 | 3,648 | 3.76 | 3,206 | 2.38 | 1,270 | 3.07 | 990 |
| 28 | 5.88 | 7,956 | 3.81 | 3,287 | 3.90 | 3,440 | 3.74 | 3,174 | 2.20 | 1,210 | 3.05 | 997 |
| 29 | 7.43 | 12,974 | 3.70 | 3,110 | 3.78 | 3,238 | 3.70 | 3,110 | 2.19 | 1,140 | 3.05 | 997 |
| 30 | 6.99 | 11,355 | 3.59 | 2,936 | 3.70 | 3,110 | 3.74 | 3,174 | 2.17 | 1,080 | 3.02 | 990 |
| 31 | 6.39 | 9,410 | 3.51 | 2,824 | ..... | ..... | 3.71 | 3,126 | ..... | ..... | 3.07 | 980 |

*a* Interpolated.

MONTHLY DISCHARGE of Oldman (Belly) River near Lethbridge, for 1915.

(Drainage area 6,764 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 1,283 | 645 | 916 | 0.135 | 0.16 | 56,323 |
| February | 766 | 690 | 722 | 0.107 | 0.11 | 40,098 |
| March | 6,160 | 642 | 1,962 | 0.290 | 0.33 | 120,638 |
| April | 5,401 | 1,730 | 3,475 | 0.514 | 0.57 | 206,777 |
| May | 14,798 | 4,280 | 10,500 | 1.552 | 1.79 | 645,620 |
| June | 22,100 | 8,990 | 14,438 | 2.135 | 2.38 | 859,121 |
| July | 15,680 | 5,907 | 9,165 | 1.355 | 1.56 | 563,534 |
| August | 8,672 | 2,824 | 5,107 | 0.755 | 0.87 | 314,017 |
| September | 4,778 | 2,712 | 3,316 | 0.490 | 0.55 | 197,316 |
| October | 4,240 | 2,880 | 3,591 | 0.531 | 0 61 | 220,802 |
| November | 3,158 | 1,080 | 2,095 | 0.310 | 0.35 | 124,661 |
| December | 1,073 | 876 | 984 | 0.145 | 0.17 | 60,504 |
| The year | ..... | ..... | ..... | ..... | 9.45 | 3,409,411 |

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Oldman drainage basin, in 1915.

| Date. | Engineer. | Stream. | Location. | Width. | Area of Section. | Mean Velocity. | Discharge. |
|---|---|---|---|---|---|---|---|
| | | | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Sec.-ft.* |
| Mar. 23 | P. H. Daniells | Allison Creek | SW. 11-8-5-5 | 13.0 | 5.65 | 1.67 | 9.400 |
| April 6 | do | do | do | 15.0 | 6.45 | 1.40 | 9.000 |
| April 17 | do | do | do | 12.0 | 6.46 | 1.48 | 9.600 |
| May 4 | do | do | do | 14.0 | 9.80 | 2.65 | 26.000 |
| May 18 | W. R. McCaffrey | do | do | 14.0 | 11.20 | 2.88 | 32.000 |
| May 31 | do | do | do | 14.0 | 11.90 | 2.84 | 34.000 |
| June 30 | do | do | do | 14.0 | 14.20 | 3.65 | 52.000 |
| July 16 | do | do | do | 14.0 | 11.42 | 2.71 | 31.000 |
| Aug. 2 | do | do | do | 14.0 | 10.60 | 1.94 | 21.000 |
| Aug. 16 | do | do | do | 14.0 | 10.15 | 1.82 | 18.500 |
| Sept. 9 | do | do | do | 14.0 | 9.63 | 1.82 | 17.600 |
| Sept. 24 | do | do | do | 14.0 | 9.55 | 1.66 | 15.800 |
| Oct. 18 | do | do | do | 13.0 | 8.58 | 1.33 | 11.400 |
| Mar. 24 | P. H. Daniells | Bellevue Creek | NE. 29-7-3-5 | ..... | ..... | ..... | 0.679*a* |
| April 7 | do | do | do | ..... | ..... | ..... | 0.679*a* |
| April 19 | do | do | do | ..... | ..... | ..... | 0.698*a* |
| May 5 | do | do | do | ..... | ..... | ..... | 1.600*a* |
| May 17 | W. R. McCaffrey | do | do | ..... | ..... | ..... | 1.673*a* |
| June 1 | do | do | do | ..... | ..... | ..... | 1.130*a* |
| June 14 | do | do | do | ..... | ..... | ..... | 1.269*a* |
| June 26 | do | do | do | ..... | ..... | ..... | 1.550*a* |
| July 17 | do | do | do | ..... | ..... | ..... | 1.000*a* |
| Aug. 3 | do | do | do | ..... | ..... | ..... | 0.716*a* |
| Aug. 17 | do | do | do | ..... | ..... | ..... | 0.717*a* |
| Sept. 10 | do | do | do | ..... | ..... | ..... | 1.112*a* |
| Sept. 25 | do | do | do | ..... | ..... | ..... | 0.604*a* |
| Oct. 19 | do | do | do | ..... | ..... | ..... | 0.679*a* |
| Oct. 30 | do | do | do | ..... | ..... | ..... | 0.717*a* |
| Nov. 12 | do | do | do | ..... | ..... | ..... | 0.641*a* |
| Dec. 11 | do | do | do | ..... | ..... | ..... | 0.641*a* |
| Dec. 28 | do | do | do | ..... | ..... | ..... | 0.534*a* |
| Mar. 24 | P. H. Daniells | Blairmore Creek | SE. 3-8-4-5 | 12.0 | 6.20 | 1.34 | 8.300 |
| April 7 | do | do | do | 21.0 | 14.80 | 2.13 | 31.600 |
| April 19 | do | do | do | 20.0 | 19.05 | 2.31 | 44.000 |
| May 5 | do | do | do | 23.0 | 26.00 | 3.62 | 94.000 |
| May 17 | W. R. McCaffrey | do | do | 22.0 | 23.80 | 3.44 | 82.000 |
| June 1 | do | do | do | 19.0 | 15.50 | 1.85 | 29.000 |
| June 30 | do | do | do | 21.0 | 18.80 | 2.28 | 43.000 |
| July 17 | do | do | do | 21.0 | 18.00 | 1.01 | 18.200 |
| Aug. 4 | do | do | do | 18.0 | 11.20 | 1.00 | 11.200 |
| Aug. 17 | do | do | do | 17.0 | 8.60 | 0.73 | 6.300 |
| Sept. 10 | do | do | do | 17.0 | 8.20 | 0.75 | 6.100 |
| Sept. 24 | do | do | do | 16.5 | 8.35 | 0.79 | 6.600 |
| Oct. 19 | do | do | do | 17.0 | 8.95 | 0.64 | 5.700 |
| Oct. 29 | do | do | do | 17.0 | 8.30 | 0.74 | 6.200 |
| Dec. 10 | do | do | do | 11.5 | 5.67 | 0.56 | 3.200 |
| Mar. 12 | P. H. Daniells | Buchanan Spring | SE. 2-7-1-5 | ..... | ..... | ..... | 0.007*a* |
| Jan. 19 | J. E. Caughey | Drumm Creek | NW. 18-7-3-5 | 7.5 | 2.42 | 0.79 | 1.910 |
| Feb. 8 | F. R. Steinberger | do | do | 7.0 | 1.70 | 0.77 | 1.310 |
| Feb. 22 | do | do | do | 8.0 | 1.60 | 0.86 | 1.380 |
| Mar. 9 | P. H. Daniells | do | do | 8.0 | 1.65 | 0.76 | 1.260 |
| Mar. 24 | do | do | do | 7.0 | 2.00 | 0.90 | 1.800 |
| April 7 | do | do | do | 9.0 | 3.60 | 1.57 | 5.600 |
| April 19 | do | do | do | 12.0 | 7.40 | 1.78 | 13.200 |
| May 5 | do | do | do | 14.0 | 10.80 | 1.95 | 21.000 |
| May 17 | W. R. McCaffrey | do | do | 14.0 | 11.65 | 1.79 | 20.000 |
| June 1 | do | do | do | 11.0 | 5.20 | 2.00 | 10.600 |
| June 14 | do | do | do | 11.5 | 5.33 | 2.05 | 10.900 |
| June 26 | do | do | do | 12.0 | 7.30 | 1.85 | 13.500 |
| July 17 | do | do | do | 10.5 | 4.05 | 1.42 | 5.800 |
| Aug. 3 | do | do | do | 10.0 | 3.80 | 1.56 | 5.900 |
| Aug. 17 | do | do | do | 10.0 | 3.90 | 1.22 | 4.800 |
| Sept. 10 | do | do | do | 10.0 | 2.40 | 1.00 | 2.400 |
| Sept. 25 | do | do | do | 9.5 | 2.95 | 0.93 | 2.800 |
| Oct. 19 | do | do | do | 9.5 | 3.65 | 0.89 | 3.200 |
| Oct. 30 | do | do | do | 9.5 | 3.37 | 0.96 | 3.200 |
| Nov. 12 | do | do | do | 10.0 | 4.68 | 0.67 | 3.100 |
| Nov. 26 | do | do | do | 10.0 | 4.70 | 0.61 | 2.900 |
| Dec. 11 | do | do | do | 9.5 | 3.07 | 0.66 | 2.040 |
| Dec. 28 | do | do | do | 9.0 | 3.30 | 0.60 | 1.990 |
| Jan. 23 | F. R. Steinberger | N. Fortier Spring | SE. 17-7-1-5 | ..... | ..... | ..... | 0.008*a* |
| Feb. 9 | do | do | do | ..... | ..... | ..... | 0.007*a* |
| Feb. 25 | do | do | do | ..... | ..... | ..... | 0.007*a* |
| Mar. 11 | P. H. Daniells | do | do | ..... | ..... | ..... | 0.008*a* |
| Mar. 20 | do | do | do | ..... | ..... | ..... | 0.009*a* |
| April 8 | do | do | do | ..... | ..... | ..... | 0.009*a* |
| April 21 | do | do | do | ..... | ..... | ..... | 0.009*a* |
| May 6 | do | do | do | ..... | ..... | ..... | 0.010*a* |
| May 19 | W. R. McCaffrey | do | do | ..... | ..... | ..... | 0.012*a* |
| June 5 | do | do | do | ..... | ..... | ..... | 0.017*a* |

*a* Weir measurement.
*b* Bucket measurement.

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Olman drainage basin, in 1915.
—*Continued.*

| Date. | Engineer. | Stream. | Location. | Width. | Area of Section. | Mean Velocity. | Discharge. |
|---|---|---|---|---|---|---|---|
| | | | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Sec.-ft* |
| June 19.... | W. R. McCaffrey.. | N. Fortier Spring.. | SE. 17-7-1-5..... | ..... | ..... | ..... | 0.026*b* |
| July 8.... | do .... | do .... | do .... | ..... | ..... | ..... | 0.059*a* |
| July 21.... | do .... | do .... | do .... | ..... | ..... | ..... | 0.051*a* |
| Aug. 5.... | do .... | do .... | do .... | ..... | ..... | ..... | 0.035*a* |
| Aug. 20.... | do .... | do .... | do .... | ..... | ..... | ..... | 0.025*a* |
| Sept. 14.... | do .... | do .... | do .... | ..... | ..... | ..... | 0.022*a* |
| Oct. 1.... | do .... | do .... | do .... | ..... | ..... | ..... | 0.020*a* |
| Oct. 13.... | do .... | do .... | do .... | ..... | ..... | ..... | 0.021*a* |
| Jan. 23.... | J. E. Caughey.... | S. Fortier Spring... | do .... | ..... | ..... | ..... | 0.005*a* |
| Feb. 9.... | F. R. Steinberger.. | do .... | do .... | ..... | ..... | ..... | 0.004*a* |
| Feb. 25.... | do .... | do .... | do .... | ..... | ..... | ..... | 0.004*a* |
| Mar. 11.... | P. H. Daniells..... | do .... | do .... | ..... | ..... | ..... | 0.008*a* |
| Mar. 20.... | do .... | do .... | do .... | ..... | ..... | ..... | 0.008*a* |
| April 8.... | do .... | do .... | do .... | ..... | ..... | ..... | 0.008*a* |
| April 21.... | do .... | do .... | do .... | ..... | ..... | ..... | 0.008*a* |
| May 6.... | do .... | do .... | do .... | ..... | ..... | ..... | 0.006*a* |
| May 19.... | W. R. McCaffrey.. | do .... | do .... | ..... | ..... | ..... | 0.006*a* |
| June 5.... | do .... | do .... | do .... | ..... | ..... | ..... | 0.008*a* |
| June 19.... | do .... | do .... | do .... | ..... | ..... | ..... | 0.008*a* |
| July 6.... | do .... | do .... | do .... | ..... | ..... | ..... | 0.008*b* |
| July 21.... | do .... | do .... | do .... | ..... | ..... | ..... | 0.008*b* |
| Aug. 5.... | do .... | do .... | do .... | ..... | ..... | ..... | 0.008*b* |
| Aug. 20.... | do .... | do .... | do .... | ..... | ..... | ..... | 0.008*b* |
| Sept. 14.... | do .... | do .... | do .... | ..... | ..... | ..... | 0.008*b* |
| Oct. 1.... | do .... | do .... | do .... | ..... | ..... | ..... | 0.008*b* |
| Oct. 13.... | do .... | do .... | do .... | ..... | ..... | ..... | 0.008*b* |
| Mar. 24.... | P. H. Daniells.... | Gold Creek..... | SE. 30-7-3-5..... | 20.0 | 15.80 | 0.86 | 13.500 |
| April 7.... | do .... | do ..... | do ..... | 22.0 | 18.40 | 1.16 | 22.000 |
| April 19.... | do .... | do ..... | do ..... | 22.0 | 25.00 | 1.76 | 44.000 |
| May 5.... | do .... | do ..... | do ..... | 24.0 | 35.00 | 3.17 | 111.000 |
| May 17.... | W. R. McCaffrey.. | do ..... | do ..... | 24.0 | 34.20 | 3.30 | 112.000 |
| June 1.... | do .... | do ..... | do ..... | 23.0 | 31.75 | 2.67 | 85.000 |
| June 14.... | do .... | do ..... | do ..... | 22.5 | 27.62 | 2.48 | 69.000 |
| June 30.... | do .... | do ..... | do ..... | 22.0 | 28.60 | 3.05 | 87.000 |
| Aug. 4.... | do .... | do ..... | do ..... | 22.0 | 26.55 | 2.85 | 76.000 |
| Aug. 17.... | do .... | do ..... | do ..... | 22.0 | 20.60 | 1.48 | 32.000 |
| Sept. 10.... | do .... | do ..... | do ..... | 21.0 | 18.95 | 1.42 | 27.000 |
| Sept. 24.... | do .... | do ..... | do ..... | 22.0 | 19.20 | 1.34 | 26.000 |
| Oct. 19.... | do .... | do ..... | do ..... | 22.0 | 17.00 | 1.37 | 23.000 |
| Nov. 27.... | do .... | do ..... | do ..... | 23.0 | 18.65 | 0.98 | 18.400 |
| Dec. 28.... | do .... | do ..... | do ..... | 20 0 | 15.20 | 0.96 | 14.700 |
| Mar. 24.... | P. H. Daniells.... | Lyon Creek..... | SE. 35-7-4-5..... | 10.0 | 4.05 | 1.28 | 5.200 |
| April 7.... | do .... | do ..... | do ..... | 17.0 | 12.60 | 1.96 | 24.000 |
| April 19.... | do .... | do ..... | do ..... | 22.0 | 17.40 | 3.18 | 54.000 |
| May 5.... | do .... | do ..... | do ..... | 23.0 | 26.00 | 3.04 | 79.000 |
| May 18.... | W. R. McCaffrey.. | do ..... | do ..... | 23.0 | 29.50 | 5.14 | 152.000 |
| June 1.... | do .... | do ..... | do ..... | 16.0 | 10.40 | 1.44 | 15.000 |
| June 30.... | do .... | do ..... | do ..... | 18.0 | 13.80 | 1.84 | 25.000 |
| Aug. 4.... | do .... | do ..... | do ..... | 16.0 | 7.80 | 1.24 | 9.700 |
| Aug. 16.... | do .... | do ..... | do ..... | 9.0 | 4.00 | 1.04 | 4.200 |
| Sept. 25.... | do .... | do ..... | do ..... | 6.0 | 1.80 | 0.83 | 1.490 |
| Oct. 18.... | do .... | do ..... | do ..... | 8.5 | 4.33 | 0.75 | 3.300 |
| Oct. 29.... | do .... | do ..... | do ..... | 16.5 | 9.83 | 1.12 | 11.000 |
| Dec. 11.... | do .... | do ..... | do ..... | 13.0 | 9.00 | 0.39 | 3.540 |
| Mar. 23.... | P. H. Daniells.... | Nez Percée Creek... | SE. 17-8-4-5..... | 5.0 | 2.10 | 1.38 | 2.900 |
| April 6.... | do .... | do .... | do ..... | 14.0 | 8.00 | 0.75 | 6.000 |
| April 17.... | do .... | do .... | do ..... | 14.0 | 9.00 | 2.05 | 18.400 |
| May 18.... | W. R. McCaffrey.. | do .... | do ..... | 15.0 | 10.20 | 2.04 | 21.000 |
| May 31.... | do .... | do .... | do ..... | 14.0 | 7.40 | 1.62 | 12.000 |
| June 16.... | do .... | do .... | do ..... | 14.0 | 9.70 | 2.28 | 21.000 |
| June 30.... | do .... | do .... | do ..... | 14.5 | 9.38 | 1.92 | 18 000 |
| July 16.... | do .... | do .... | do ..... | 14.0 | 5.40 | 1.15 | 6.200 |
| Aug. 4.... | do .... | do .... | do ..... | 16.0 | 10.00 | 2.06 | 20.000 |
| Aug. 17.... | do .... | do .... | do ..... | 6.5 | 3.40 | 0.84 | 2.800 |
| Sept. 9.... | do .... | do .... | do ..... | 4.5 | 2.04 | 1.22 | 2.500 |
| Sept. 24.... | do .... | do .... | do ..... | 5.0 | 1.40 | 1.41 | 2.000 |
| Oct. 29.... | do .... | do .... | do ..... | 6.0 | 1.90 | 0.79 | 1.510 |
| Nov. 27.... | do .... | do .... | do ..... | 2.0 | 0.45 | 2.40 | 1.080 |
| Dec. 27.... | do .... | do .... | do ..... | 2.5 | 0.50 | 0.82 | 0.410 |
| May 31.... | do .... | Starr Creek..... | SW. 7-8-4-5..... | 9.0 | 7.10 | 2.70 | 19.200 |
| June 15.... | do .... | do ..... | do ..... | 10.0 | 7.30 | 2.50 | 18.200 |
| July 16.... | do .... | do ..... | do ..... | 8.0 | 4.83 | 1.79 | 8.600 |
| Mar. 24.... | P. H. Daniells.... | York Creek..... | NW. 34-7-4-5.... | 15.0 | 4.75 | 0.51 | 2.430 |
| April 7.... | do .... | do ..... | do ..... | 20.0 | 11.80 | 1.19 | 14.000 |
| April 19.... | do .... | do ..... | do ..... | 24.0 | 21.00 | 2.48 | 52.000 |
| May 5.... | do .... | do ..... | do ..... | 25.0 | 22.00 | 2.91 | 64.000 |
| May 17.... | W. R. McCaffrey.. | do ..... | do ..... | 24.0 | 20.80 | 2.82 | 58.000 |
| June 1.... | do .... | do ..... | do ..... | 20.0 | 16.60 | 2.24 | 37.000 |
| June 26.... | do .... | do ..... | do ..... | 27.0 | 26.10 | 2.91 | 76.000 |
| July 17.... | do .... | do ..... | do ..... | 13.0 | 13.55 | 1.11 | 15.000 |

*a* Weir measurement.
*b* Bucket measurement.

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Oldman drainage basin, in 1915.
—*Concluded.*

| Date. | Engineer. | Stream. | Location. | Width. | Area of Section. | Mean Velocity. | Discharge. |
|---|---|---|---|---|---|---|---|
| | | | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Sec. ft.* |
| Aug. 4.... | R. W. McCaffrey.. | York Creek..... | NW. 34-7-4-5..... | 18.0 | 11.90 | 1.10 | 13.000 |
| Aug. 17.... | do .... | do ..... | do ..... | 13.5 | 9.53 | 0.70 | 6.700 |
| Sept. 10.... | do .... | do ..... | do ..... | 8.5 | 4.83 | 1.05 | 5.100 |
| Sept. 24.... | do .... | do ..... | do ..... | 9.0 | 4.95 | 1.11 | 5.500 |
| Oct. 19.... | do .... | do ..... | do ..... | 9.0 | 4.65 | 0.76 | 5.500 |
| Oct. 29.... | do .... | do ..... | do ..... | 8.0 | 4.70 | 1.05 | 5.000 |
| Dec. 10.... | do .... | do ..... | do ..... | 5.5 | 2.15 | 1.98 | 4.230 |
| Aug. 12.... | R. H. Goodchild... | Canyon Creek.... | NW. 5-12-28-4... | ..... | ..... | ..... | 0.812*a* |
| Oct. 8.... | G. H. Whyte and W. R. McCaffrey | Carbondale River.. | SW. 14-6-3-5..... | 49.0 | 64.05 | 2.20 | 141.000 |
| Oct. 7.... | do | Castle River (W. Br.)..... | NW. 16-5-3-5..... | 36.5 | 37.52 | 2.72 | 102.000 |
| Oct. 8.... | do | Castle River..... | do ..... | 54.0 | 66.50 | 2.55 | 169.000 |
| May 31.... | W. R. McCaffrey.. | Creek No. 1..... | SE. 12-8-5-5..... | 5.0 | 2.30 | 1.97 | 4.530 |
| June 15.... | do .... | do ..... | do ..... | 5.0 | 2.16 | 2.40 | 5.200 |
| July 16.... | do .... | do ..... | do ..... | 5.5 | 2.43 | 1.51 | 3.700 |
| Aug. 7.... | R. H. Goodchild... | Spring..... | Sec. 5-13-29-4.... | ..... | ..... | ..... | 0.180*a* |

*a* Weir measurement.

## WATERTON RIVER DRAINAGE BASIN.

### *General Description.*

Waterton River rises in the northwestern portion of the state of Montana, on the eastern slope of the Rocky Mountains. It flows in a northerly direction and, passing through a chain of lakes near the international boundary, known as Waterton Lakes, it continues in a north and easterly direction and finally empties into Belly River near Stand Off, Alberta.

The topography of the basin is of a varied character, ranging from the mountainous regions of Montana to the rolling prairie of southern Alberta. The tributaries are mostly in the upper portion of the basin, near the international boundary and from the west side.

There is a large snow-fall in the upper portion of the basin, and the melting of this combined with heavy rains often causes floods on this river in the early summer. Thereafter the river steadily decreases in volume, until the minimum is reached about mid-winter.

The names of the principal tributaries of this stream are, the Little Kootenay, which rises in Montana and empties into the south end of the Waterton Lakes; Boundary Creek, and East Boundary Creek, two small streams emptying into the upper Waterton Lake from the west and east slopes, are south of the international boundary; Hell Roaring Creek is a small stream in Canada, flowing into the upper Waterton Lake from the east slope; Bertha Creek is a small tributary mostly snow fed, from the west slope of the upper lake, and originating solely in Canada; Cameron, or Oil Creek, as it is called locally, has its head in Cameron Lake, a body of water divided by the international boundary; Blakiston Brook, a stream locally called Pass Creek, rises wholly in Canada, and is a steady source of supply to the waters of the Waterton River; Crooked Creek drains the northeast slope of Sheep Mountain and the nearby foothills and empties into Waterton River one mile below the lakes; Pine Creek, Yarrow Creek and Drywood River are the chief tributaries of the river system from foothills on the west slope.

#### WATERTON RIVER AT WATERTON MILLS.

*Location.*—On the NE. ¼ Sec. 8, Tp. 2, Rge. 29, W. 4th Mer., at Waterton Mills post office.

*Records available.*—August 26, 1908, to December 31, 1915.

*Gauge.*—Vertical staff. Zero of gauge maintained at 4,153 07 feet during 1908-12. Zero of gauge maintained at 4,152 87 feet during 1913-15.

*Bench-mark.*—Permanent iron bench-mark, located within six feet of the gauge. Elevation, 4,152 87 feet above mean sea level. (Irrigation Surveys datum.)

*Channel.*—Composed of rocks, stone and gravel; not liable to shift.

*Discharge measurements.*—Made from a cable car at ordinary stages and by wading at very low stages.

*Winter flow.*—The high velocity prevents a complete ice cover at the gauge during the winter and open water measurements are obtained.

*Observer.*—H. H. Hanson, Waterton Mills post office, Alberta.

*Remarks.*—With a view to obtaining more accurate measurements the cable was moved from the NE. ¼ Sec. 8, Tp. 2, Rge. 29, W. 4th Mer., to SW. ¼ Sec. 21, Tp. 2, Rge. 29, W. 4th Mer., in November, 1914. The channel at this point is straight for about 300 feet above and 300 feet below the cable. The bed of the stream consists of small stones and gravel and is not liable to shift.

During 1915, the high cut-bank, at the cable station, kept continually slipping and may weaken the anchorage.

DISCHARGE MEASUREMENTS of Waterton River at Waterton Mills, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 6 | O. H. Hoover | 126 | 231.0 | 0.67 | 2.44 | 155 |
| Feb. 3 | W. A. Burton | 124 | 133.0 | 0.69 | 2.17 | 91 |
| Feb. 17 | J. E. Degnan | 88 | 89.8 | 1.01 | 2.16 | 90 |
| Feb. 19 | do | 86 | 88.5 | 0.96 | 2.13 | 85 |
| Mar. 9 | do | 94 | 90.0 | 0.80 | 2.05 | 71 |
| April 10 | V. A. Newhall | 128 | 296.0 | 1.00 | 2.95 | 295 |
| April 28 | do | 143 | 446.6 | 1.76 | 3.55 | 776 |
| May 3 | do | 155 | 601.3 | 2.48 | 4.03 | 1,434 |
| May 27 | do | 152 | 543.0 | 2.28 | 3.85 | 1,206 |
| May 31 | do | 154 | 558.0 | 2.37 | 3.94 | 1,294 |
| June 30 | do | 157 | 615.0 | 2.62 | 4.12 | 1,548 |
| July 22 | do | 148 | 487.4 | 1.81 | 3.62 | 845 |
| Aug. 10 | do | 141 | 401.5 | 1.35 | 3.31 | 515 |
| Aug. 25 | do | 142 | 407.0 | 1.06 | 3.14 | 402 |
| Sept. 22 | do | 148 | 480.5 | 1.31 | 3.39 | 598 |
| Oct. 13 | do | 150 | 477.3 | 1.30 | 3.35 | 564 |
| Nov. 18 | W. H. Story | 135 | 350.2 | 0.81 | 3.10 | 267*a* |
| Dec. 12 | do | 134 | 334.4 | 0.74 | 2.70 | 231 |

*a* Slush ice possibly affected accuracy of measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Waterton River at Waterton Mills, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.41 | 136 | 2.20 | 98 | 2.08 | 79 | 2.51 | 157 | 3.74 | 1,006 | 3.94 | 1,294 |
| 2 | 2.44 | 142 | 2.17 | 93 | 2.08 | 79 | 2.47 | 148 | 3.91 | 1,246 | 3.97 | 1,342 |
| 3 | 2.43 | 140 | 2.19 | 96 | 2.08 | 79 | 2.58 | 175 | 4.01 | 1,406 | 4.04 | 1,454 |
| 4 | 2.35 | 124 | 2.20 | 98 | 2.08 | 79 | 2.64 | 191 | 4.02 | 1,422 | 4.27 | 1,839 |
| 5 | 2 36 | 126 | 2.18 | 95 | 2.08 | 79 | 2.69 | 205 | 4.00 | 1,390 | 4.40 | 2,070 |
| 6 | 2.47 | 148 | 2.18 | 95 | 2.08 | 79 | 2.75 | 224 | 3.94 | 1,294 | 4.44 | 2,142 |
| 7 | 2.35 | 124 | 2.17 | 93 | 2.07 | 77 | 2.92 | 289 | 3.91 | 1,246 | 4.42 | 2,106 |
| 8 | 2.33 | 120 | 2.16 | 92 | 2.07 | 77 | 2.95 | 302 | 3.99 | 1,374 | 4.41 | 2,088 |
| 9 | 2.30 | 114 | 2.16 | 92 | 2.05 | 74 | 3.04 | 346 | 4.18 | 1,686 | 4.34 | 1,962 |
| 10 | 2.42 | 138 | 2.17 | 93 | 2.10 | 82 | 2.94 | 298 | 4.25 | 1,805 | 4.31 | 1,908 |
| 11 | 2.35 | 124 | 2.18 | 95 | 2.10 | 82 | 2.99 | 320 | 4.30 | 1,890 | 4.25 | 1,805 |
| 12 | 2.26 | 108 | 2.23 | 103 | 2.11 | 84 | 3.02 | 335 | 4.19 | 1,703 | 4.21 | 1,737 |
| 13 | 2.05 | 74 | 2.19 | 96 | 2.10 | 82 | 3.03 | 341 | 4.21 | 1,737 | 4.16 | 1,652 |
| 14 | 2.45 | 144 | 2.18 | 95 | 2.10 | 82 | 3.12 | 392 | 4.22 | 1,754 | 4.17 | 1,669 |
| 15 | 2.26 | 108 | 2.18 | 95 | 2.14 | 88 | 3.19 | 438 | 4.17 | 1,669 | 4.19 | 1,703 |
| 16 | 2.29 | 112 | 2.16 | 92 | 2.05 | 74 | 3.28 | 504 | 4.10 | 1,550 | 4.20 | 1,720 |
| 17 | 2.25 | 106 | 2.15 | 90 | 2.14 | 88 | 3.34 | 556 | 4.04 | 1,454 | 4.22 | 1,754 |
| 18 | 2.24 | 104 | 2.13 | 87 | 2.14 | 88 | 3.47 | 680 | 4.00 | 1,390 | 4.25 | 1,805 |
| 19 | 2.22 | 101 | 2.13 | 87 | 2.11 | 84 | 3.55 | 765 | 3.93 | 1,278 | 4.25 | 1,805 |
| 20 | 2.19 | 96 | 2.12 | 85 | 2.12 | 85 | 3.72 | 978 | 3.86 | 1,174 | 4.21 | 1,737 |
| 21 | 2.19 | 96 | 2.12 | 85 | 2.13 | 87 | 3.73 | 992 | 3.91 | 1,246 | 4.15 | 1,635 |
| 22 | 2.20 | 98 | 2.13 | 87 | 2.14 | 88 | 3.75 | 1,020 | 3.89 | 1,216 | 4.10 | 1,550 |
| 23 | 2.15 | 90 | 2.13 | 87 | 2.19 | 96 | 3.73 | 992 | 3.75 | 1,020 | 4.06 | 1,486 |
| 24 | 2.16 | 92 | 2.11 | 84 | 2.26 | 108 | 3.71 | 964 | 3.80 | 1,090 | 4.04 | 1,454 |
| 25 | 2.17 | 93 | 2.11 | 84 | 2.27 | 109 | 3.65 | 885 | 3.83 | 1,132 | 4.07 | 1,502 |
| 26 | 2.18 | 95 | 2.10 | 82 | 2.29 | 112 | 3.60 | 825 | 3.84 | 1,146 | 4.19 | 1,703 |
| 27 | 2.25 | 106 | 2.14 | 88 | 2.32 | 118 | 3.57 | 789 | 3.85 | 1,160 | 4.16 | 1,652 |
| 28 | 2.18 | 95 | 2.10 | 82 | 2.33 | 120 | 3.54 | 754 | 3.84 | 1,146 | 4.14 | 1,618 |
| 29 | 2.19 | 96 | ..... | ..... | 2.35 | 124 | 3.53 | 743 | 3.90 | 1,230 | 4.13 | 1,601 |
| 30 | 2.18 | 95 | ..... | ..... | 2.37 | 128 | 3.61 | 837 | 3.93 | 1,278 | 4.12 | 1,584 |
| 31 | 2.17 | 93 | ..... | ..... | 2.40 | 134 | ..... | ..... | 3.94 | 1,294 | ..... | ..... |

NOTE.—Open water in January, February and March.

DAILY GAUGE HEIGHT AND DISCHARGE of Waterton River at Waterton Mills, for 1915.
—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 4.14 | 1,618 | 3.58 | 801 | 2.99 | 320 | 3.22 | 459 | 3.22 | 459 | 2.61 | 183 |
| 2 | 4.09 | 1,534 | 3.55 | 765 | 3.03 | 341 | 3.30 | 520 | 3.16 | 417 | 2.65 | 194 |
| 3 | 4.06 | 1,486 | 3.51 | 721 | 3.30 | 520 | 3.33 | 547 | 3.18 | 431 | 2.72 | 214 |
| 4 | 4.01 | 1,406 | 3.49 | 700 | 3.32 | 538 | 3.40 | 610 | 3.19 | 438 | 2.74 | 221 |
| 5 | 3.95 | 1,310 | 3.44 | 650 | 3.27 | 496 | 3.43 | 640 | 3.20 | 445 | 2.76 | 227 |
| 6 | 3.90 | 1,230 | 3.42 | 630 | 3.25 | 480 | 3.42 | 630 | 3.21 | 452 | 2.73 | 218 |
| 7 | 3.88 | 1,202 | 3.39 | 601 | 3.21 | 452 | 3.41 | 620 | 3.17 | 424 | 2.68 | 202 |
| 8 | 3.85 | 1,160 | 3.35 | 565 | 3.18 | 431 | 3.42 | 630 | 3.12 | 392 | 2.71 | 211 |
| 9 | 3.80 | 1,090 | 3.34 | 556 | 3.24 | 473 | 3.41 | 620 | 3.14 | 404 | 2.74 | 221 |
| 10 | 3.76 | 1,034 | 3.31 | 529 | 3.26 | 488 | 3.39 | 601 | 3.14 | 404 | 2.73 | 218 |
| 11 | 3.71 | 964 | 3.29 | 512 | 3.24 | 473 | 3.37 | 583 | 3.12 | 392 | 2.69 | 205 |
| 12 | 3.66 | 898 | 3.26 | 488 | 3.22 | 459 | 3.35 | 565 | 3.07 | 363 | 2.70 | 208 |
| 13 | 3.60 | 825 | 3.27 | 496 | 3.20 | 445 | 3.37 | 583 | 3.11 | 386 | 2.64*f* | 191 |
| 14 | 3.59 | 813 | 3.24 | 473 | 3.23 | 466 | 3.32 | 538 | 3.00 | 324 | 2.65 | 194 |
| 15 | 3.55 | 765 | 3.21 | 452 | 3.20 | 445 | 3.31 | 529 | 3.02 | 335 | 2.63 | 188 |
| 16 | 3.51 | 721 | 3.21 | 452 | 3.25 | 480 | 3.31 | 529 | 2.99 | 320 | 2.64 | 191 |
| 17 | 3.65 | 885 | 3.19 | 438 | 3.33 | 547 | 3.32 | 538 | 3.18 | 431 | 2.61 | 183 |
| 18 | 3.68 | 924 | 3.15 | 410 | 3.36 | 574 | 3.37 | 583 | 3.01 | 330 | 2.63 | 188 |
| 19 | 3.64 | 873 | 3.14 | 404 | 3.40 | 610 | 3.31 | 529 | 2.98 | 315 | 2.65 | 194 |
| 20 | 3.62 | 849 | 3.20 | 445 | 3.41 | 620 | 3.30 | 520 | 3.42 | 630 | 2.68 | 202 |
| 21 | 3.61 | 837 | 3.23 | 466 | 3.42 | 630 | 3.32 | 538 | 3.26 | 488 | 2.62 | 186 |
| 22 | 3.60 | 825 | 3.19 | 438 | 3.40 | 610 | 3.25 | 480 | 3.04 | 346 | 2.65 | 194 |
| 23 | 3.58 | 801 | 3.16 | 417 | 3.38 | 592 | 3.28 | 504 | 2.91 | 284 | 2.61 | 183 |
| 24 | 3.56 | 777 | 3.15 | 410 | 3.37 | 583 | 3.26 | 488 | 3.20 | 445 | 2.61 | 183 |
| 25 | 3.54 | 754 | 3.13 | 398 | 3.35 | 565 | 3.26 | 488 | 2.95 | 302 | 2.60 | 180 |
| 26 | 3.57 | 789 | 3.12 | 392 | 3.32 | 538 | 3.24 | 473 | 3.03 | 341 | 2.59 | 177 |
| 27 | 3.53 | 743 | 3.10 | 380 | 3.30 | 520 | 3.25 | 480 | 3.10 | 380 | 2.64 | 192 |
| 28 | 3.58 | 801 | 3.06 | 358 | 3.30 | 520 | 3.31 | 529 | 2.60 | 180 | 2.64 | 192 |
| 29 | 3.62 | 849 | 3.05 | 352 | 3.29 | 512 | 3.20 | 445 | 3.12 | 392 | 2.61 | 183 |
| 30 | 3.61 | 837 | 3.04 | 346 | 3.25 | 480 | 3.21 | 452 | 2.85 | 260 | 2.46 | 146 |
| 31 | 3.58 | 801 | 3.03 | 341 | ..... | ..... | 3.21 | 452 | ..... | ..... | 2.78 | 234 |

*f* New winter gauge rod installed.
Water open at gauge in November and December.

MONTHLY DISCHARGE of Waterton River at Waterton Mills, for 1915.

(Drainage area 214 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 148 | 74 | 111 | 0.519 | 0.599 | 6,825 |
| February | 103 | 82 | 91 | 0.425 | 0.442 | 5,054 |
| March | 134 | 74 | 92 | 0.430 | 0.496 | 5,657 |
| April | 1,020 | 148 | 548 | 2.561 | 2.857 | 32,608 |
| May | 1,890 | 1,006 | 1,369 | 6.397 | 7.375 | 84,178 |
| June | 2,142 | 1,294 | 1,713 | 8.005 | 8.932 | 101,930 |
| July | 1,618 | 721 | 981 | 4.584 | 5.285 | 60,419 |
| August | 801 | 341 | 496 | 2.318 | 2.673 | 30,498 |
| September | 630 | 320 | 507 | 2.369 | 2.643 | 30,169 |
| October | 640 | 445 | 549 | 2.519 | 2.904 | 33,142 |
| November | 630 | 180 | 384 | 1.793 | 2.000 | 22,832 |
| December | 234 | 146 | 197 | 0.920 | 1.061 | 12,107 |
| The year | ..... | ..... | ..... | ..... | 37.267 | 425,319 |

CROOKED CREEK NEAR WATERTON MILLS.

*Location.*—On the SW. ¼ Sec. 22, Tp. 2, Rge. 29, W. 4th Mer.

*Records available.*—September 15, 1909, to October 8, 1915.

*Gauge.*—Vertical staff. Zero of gauge maintained at elevation 89.48 feet during 1913–15. For previous gauge datum refer to previous reports.

*Bench-mark.*—Permanent iron bench-mark located on the left bank 25 feet from the gauge. Assumed elevation, 100.00 feet.

*Channel.*—Consists of sand, gravel and small stones, not liable to shift.

*Discharge measurements.*—Made by wading.

*Winter flow.*—No records are taken during winter season.

*Observer.*—Frank Rowe.

DISCHARGE MEASUREMENTS of Crooked Creek near Waterton Mills, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 8 | V. A. Newhall | 13.4 | 11.27 | 1.24 | 1.98 | 14.0 |
| April 10 | do | 17.0 | 8.07 | 1.52 | 1.93 | 12.2 |
| April 27 | do | 12.4 | 9.02 | 1.08 | 1.81 | 9.8 |
| May 3 | do | 17.0 | 24.05 | 2.02 | 2.59 | 48.0 |
| May 25 | do | 16.0 | 19.36 | 1.89 | 2.34 | 37.0 |
| May 28 | do | 15.4 | 18.12 | 1.73 | 2.25 | 31.0 |
| June 29 | do | 17.0 | 24.77 | 1.88 | 2.44 | 46.0 |
| June 30 | do | 17.8 | 28.57 | 2.21 | 2.70 | 63.0 |
| July 20 | do | 17.0 | 25.23 | 1.89 | 2.50 | 48.0 |
| Aug. 12 | do | 15.5 | 15.20 | 1.49 | 2.11 | 23.0 |
| Aug. 25 | do | 16.1 | 17.50 | 1.56 | 2.215 | 27.0 |
| Sept. 11 | do | 17.0 | 25.46 | 1.90 | 2.52 | 48.0 |
| Sept. 23 | do | 15.5 | 18.30 | 1.60 | 2.25 | 29.0 |
| Oct. 13 | do | 17.7 | 28.07 | 2.03 | 2.58 | 57.0 |

DAILY GAUGE HEIGHT AND DISCHARGE of Crooked Creek near Waterton Mills, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec. ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.19 | 26.0 | 3.08 | 100 | 2.20 | 26 |
| 2 | ..... | ..... | 2.51 | 50.0 | 2.60 | 57 | 2.24 | 29 |
| 3 | ..... | ..... | 2.59 | 56.0 | 2.40 | 41 | 2.95 | 87 |
| 4 | ..... | ..... | 2.23 | 28.0 | 2.45 | 45 | 5.12 | 304 |
| 5 | ..... | ..... | 2.08 | 19.4 | 2.46 | 46 | 3.35 | 127 |
| 6 | ..... | ..... | 2.10 | 20.0 | 2.31 | 34 | 3.20 | 122 |
| 7 | ..... | ..... | 2.03 | 16.8 | 2.35 | 37 | 3.22 | 114 |
| 8 | ..... | ..... | 2.03 | 16.8 | 2.34 | 35 | 2.85 | 77 |
| 9 | ..... | ..... | 1.89 | 11.5 | 2.36 | 38 | 2.75 | 69 |
| 10 | ..... | ..... | 1.92 | 12.4 | 2.33 | 35 | 3.35 | 127 |
| 11 | ..... | ..... | 1.94 | 13.1 | 2.27 | 31 | 3.27 | 119 |
| 12 | ..... | ..... | 1.94 | 13.1 | 2.24 | 29 | 3.25 | 117 |
| 13 | ..... | ..... | 1.96 | 13.8 | 2.26 | 30 | 3.21 | 113 |
| 14 | ..... | ..... | 2.21 | 27.0 | 2.26 | 30 | 3.28 | 120 |
| 15 | ..... | ..... | 2.18 | 25.0 | 3.00 | 92 | 3.07 | 99 |
| 16 | 2.90 | 82 0 | 2.07 | 19.0 | 2.95 | 87 | 3.03 | 95 |
| 17 | 2.86 | 78 0 | 2.00 | 15.4 | 2.81 | 74 | 2.97 | 89 |
| 18 | 2.79 | 72 0 | 1.97 | 14.2 | 2.95 | 87 | 3.07 | 99 |
| 19 | 2.61 | 58.0 | 1.92 | 12.4 | 2.70 | 65 | 3.08 | 100 |
| 20 | 2.27 | 31.0 | 1.89 | 11.5 | 2.55 | 53 | 2.79 | 72 |
| 21 | 2.10 | 20.0 | 1.89 | 11.5 | 2.46 | 46 | 2.65 | 61 |
| 22 | 2.03 | 16.8 | 2.03 | 16.8 | 2.40 | 41 | 2.58 | 55 |
| 23 | 2.06 | 18.3 | 1.95 | 13.4 | 2.35 | 37 | 2.55 | 53 |
| 24 | 1.92 | 12.4 | 1.90 | 11.8 | 2.32 | 35 | 2.47 | 47 |
| 25 | 1.89 | 11.5 | 1.87 | 11.0 | 2.35 | 37 | 2.55 | 53 |
| 26 | 1.90 | 11.8 | 1.84 | 10.2 | 2.30 | 33 | 3.00 | 92 |
| 27 | 2.01 | 15.9 | 1.83 | 10.0 | 2.26 | 30 | 2.77 | 71 |
| 28 | 1.97 | 14.2 | 1.81 | 9.6 | 2.25 | 30 | 2.70 | 65 |
| 29 | 1.97 | 14.2 | 1.79 | 9.2 | 2.27 | 31 | 2.50 | 49 |
| 30 | 1.78 | 9.0 | 1.85 | 10.4 | 2.24 | 29 | 2.62 | 59 |
| 31 | 1.78 | 9.0 | ..... | ..... | 2.22 | 28 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Crooked Creek near Waterton Mills, for 1915.
—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.35 | 127 | 3.00 | 92.0 | 1.96 | 13.8 | 2.25 | 30 |
| 2 | 2.92 | 84 | 2.85 | 77.0 | 2.17 | 25.0 | 2.21 | 27 |
| 3 | 2.75 | 69 | 2.70 | 65.0 | 2.76 | 70.0 | 2.50 | 49 |
| 4 | 2.61 | 58 | 2.47 | 47.0 | 2.56 | 54.0 | 2.60 | 57 |
| 5 | 2.59 | 56 | 2.39 | 40.0 | 2.33 | 35.0 | 2.51 | 50 |
| 6 | 2.51 | 50 | 2.33 | 35.0 | 2.20 | 26.0 | 2.54 | 52 |
| 7 | 2.53 | 51 | 2.30 | 33.0 | 2.12 | 22.0 | 2.48 | 47 |
| 8 | 2.48 | 47 | 2.22 | 28.0 | 2.11 | 21.0 | 2.52 | 51 |
| 9 | 2.38 | 39 | 2.22 | 28.0 | 2.75 | 69.0 | ..... | ..... |
| 10 | 2.35 | 37 | 2.18 | 25.0 | 2.67 | 63.0 | ..... | ..... |
| 11 | 2.29 | 32 | 2.14 | 24.0 | 2.54 | 52.0 | ..... | ..... |
| 12 | 2.20 | 26 | 2.10 | 20.0 | 2.46 | 46.0 | ..... | ..... |
| 13 | 2.20 | 26 | 2.13 | 22.0 | 2.38 | 39.0 | ..... | ..... |
| 14 | 2.31 | 34 | 2.25 | 30.0 | 2.36 | 38.0 | ..... | ..... |
| 15 | 2.22 | 28 | 2.25 | 30.0 | 2.40 | 41.0 | ..... | ..... |
| 16 | 2.18 | 25 | 2.13 | 22.0 | 2.36 | 38.0 | ..... | ..... |
| 17 | 2.37 | 39 | 2.12 | 22.0 | 2.29 | 32.0 | ..... | ..... |
| 18 | 3.70 | 162 | 2.08 | 19.4 | 2.28 | 32.0 | ..... | ..... |
| 19 | 2.80 | 73 | 2.06 | 18.3 | 2.34 | 36.0 | ..... | ..... |
| 20 | 2.50 | 49 | 5.80 | 372.0 | 2.40 | 41.0 | ..... | ..... |
| 21 | 2.40 | 41 | 2.85 | 77.0 | 2.33 | 35.0 | ..... | ..... |
| 22 | 2.30 | 33 | 2.38 | 39.0 | 2.26 | 30.0 | ..... | ..... |
| 23 | 2.26 | 30 | 2.28 | 32.0 | 2.24 | 29.0 | ..... | ..... |
| 24 | 2.29 | 32 | 2.23 | 28.0 | 2.36 | 38.0 | ..... | ..... |
| 25 | 2.25 | 30 | 2.18 | 25.0 | 2.34 | 36.0 | ..... | ..... |
| 26 | 3.15 | 107 | 2.13 | 22.0 | 2.26 | 30.0 | ..... | ..... |
| 27 | 2.75 | 69 | 2.12 | 22.0 | 2.34 | 36.0 | ..... | ..... |
| 28 | 3.23 | 115 | 2.09 | 19.9 | 2.36 | 38.0 | ..... | ..... |
| 29 | 3.10 | 102 | 2.05 | 17.8 | 2.31 | 34.0 | ..... | ..... |
| 30 | 3.20 | 112 | 2.00 | 15.4 | 2.26 | 30.0 | ..... | ..... |
| 31 | 3.13 | 105 | 1.97 | 14.2 | ..... | ..... | ..... | ..... |

Observer discontinued observations after Oct. 8.

MONTHLY DISCHARGE of Crooked Creek near Waterton Mills, for 1915.

(Drainage area 26 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (16-31) | 82.0 | 9.0 | 30.0 | 1.15 | 0.684 | 952 |
| April | 56.0 | 9.2 | 17.8 | 0.68 | 0.759 | 1,059 |
| May | 100.0 | 28.0 | 45.9 | 1.76 | 2.029 | 2,822 |
| June | 304.0 | 26.0 | 90.0 | 3.46 | 3.860 | 5,355 |
| July | 162.0 | 25.0 | 61.0 | 2.35 | 2.709 | 3,751 |
| August | 372.0 | 14.2 | 44.0 | 1.69 | 1.948 | 2,705 |
| September | 70.0 | 13.8 | 38.0 | 1.46 | 1.629 | 2,261 |
| October (1-8) | 57.0 | 27.0 | 45.0 | 1.73 | 0.514 | 714 |
| The period | ..... | ..... | ..... | ..... | 14.132 | 19,619 |

WATERTON RIVER NEAR STAND OFF.

*Location.*—On NW. ¼ Sec. 28, Tp. 6, Rge. 25, W. 4th Mer., about three-quarters of a mile below the bridge on the Macleod trail.

*Records available.*—November 5, 1915, to December 31, 1915.

*Gauge.*—Three sections of enamelled gauge rods from 0.0 ft. to 9.0 ft. attached to a 4″ x 4″ post braced by two, 2″ x 4″, posts. Zero maintained at elevation of 90.11 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Composed of boulders and gravel, nor likely to shift except when influenced by heavy flood conditions.

*Discharge measurements.*—Made from cable car.

*Winter flow.*—Measurements made under cable at regular station.

*Observer.*—E. Cuthbert Bellerby.

*Remarks.*—This station was established November 5, 1915, by V. A. Newhall.

DISCHARGE MEASUREMENTS of Waterton River near Stand Off, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Nov. 5 | V. A. Newhall | 128 | 292.2 | 2.20 | 1.78 | 654 |
| Dec. 3 | W. H. Storey | 123 | 224.7 | 1.66 | 1.44 | 375 |
| Dec. 21 | do | 130 | 256.4 | 1.02 | 2.11 | 262 |

DAILY GAUGE HEIGHT AND DISCHARGE of Waterton River near Stand Off, for 1915.

| Day. | November. | | December. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.22 | 400 |
| 2 | ..... | ..... | 1.22 | 357 |
| 3 | ..... | ..... | 1.44 | 375 |
| 4 | ..... | ..... | 1.36 | 374 |
| 5 | 1.78*a* | 657 | 1.42 | 374 |
| 6 | 1.75 | 630 | 1.40 | 374 |
| 7 | 1.76 | 639 | 1.25 | 370 |
| 8 | 1.74 | 621 | 1.28 | 360 |
| 9 | 1.69 | 577 | 1.46 | 330 |
| 10 | 1.70 | 585 | 1.29 | 298 |
| 11 | 1.64 | 534 | 1.93 | 305 |
| 12 | 1.66 | 551 | 2.03*b* | 308 |
| 13 | 1.43 | 371 | 1.94 | 306 |
| 14 | 1.57 | 540 | 2.15 | 300 |
| 15 | 1.55 | 545 | 1.80 | 296 |
| 16 | 1.68 | 545 | 1.71 | 294 |
| 17 | 1.64 | 530 | 1.88 | 300 |
| 18 | 1.61 | 504 | 1.42 | 312 |
| 19 | 1.47 | 475 | 1.46 | 310 |
| 20 | 1.34 | 435 | 1.67 | 285 |
| 21 | 1.59 | 445 | 2.00 | 262 |
| 22 | 1.62 | 480 | 2.17 | 277 |
| 23 | 1.58 | 500 | 1.95 | 273 |
| 24 | 1.44 | 470 | 1.65 | 258 |
| 25 | 1.30 | 397 | 1.72 | 247 |
| 26 | 1.35 | 395 | 1.85 | 238 |
| 27 | 1.31 | 400 | 1.80 | 243 |
| 28 | 1.12 | 364 | 1.73 | 235 |
| 29 | 0.68 | 338 | 1.56 | 225 |
| 30 | 1.59 | 432 | 1.80 | 240 |
| 31 | ..... | ..... | 2.80*b* | 253 |

*a* Station established Nov. 5, 1915.
*b* to *b* River covered by ice.
Ice conditions from Nov. 14.

MONTHLY DISCHARGE of Waterton River near Stand Off, for 1915.

(Drainage area 740 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| November (5-30) | 657 | 338 | 498 | 0.673 | 0.65 | 25,676 |
| December | 400 | 225 | 303 | 0.409 | 0.47 | 18,631 |
| The period | ..... | ..... | ..... | ..... | 1.12 | 44,307 |

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Waterton River drainage basin, in 1915.

| Date. | Engineer. | Stream. | Location. | Width. | Area of Section. | Mean Velocity. | Discharge. |
|---|---|---|---|---|---|---|---|
| | | | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Sec.-ft.* |
| April 10 | V. A. Newhall | Bertha Creek | Tp. 1-30-4 | 4.8 | 1.89 | 0.43 | 0.82 |
| Feb. 18 | J. E. Degnan | Blakiston Brook | 36-1-30-4 | 22.0 | 13.60 | 1.19 | 16.20 |
| April 10 | V. A. Newhall | do | do | 30.2 | 31.70 | 2.03 | 64.00 |
| May 3 | do | do | do | 28.0 | 67.10 | 4.89 | 328.00 |
| May 29 | do | do | do | 38.0 | 73.20 | 4.88 | 357.00 |
| July 3 | do | do | do | 42.0 | 63.70 | 4.38 | 279.00 |
| July 24 | do | do | do | 37.8 | 42.60 | 2.92 | 125.00 |
| Aug. 11 | do | do | do | 34.9 | 33.20 | 2.55 | 85.00 |
| Aug. 26 | do | do | do | 35.0 | 34.40 | 2.02 | 70.00 |
| Sept. 15 | do | do | do | 37.0 | 40.70 | 2.89 | 117.00 |
| Sept. 13 | do | Boundary Creek | Glacier National Park | 33.0 | 28.40 | 0.91 | 26.00 |
| Sept. 13 | do | East Boundary Creek | do | 8.7 | 3.50 | 1.02 | 3.60 |
| Feb. 18 | J. E. Degnan | Cameron Creek | 26-1-30-4 | 20.0 | 76.00 | 0.62 | 9.80 |
| April 9 | V. A. Newhall | do | do | 31.5 | 41.40 | 1.01 | 42.00 |
| May 1 | do | do | do | 44.0 | 74.50 | 2.38 | 178.00 |
| May 29 | do | do | do | 39.5 | 59.90 | 3.42 | 204.00 |
| July 3 | do | do | do | 51.0 | 70.60 | 2.27 | 161.00 |
| July 24 | do | do | do | 37.5 | 41.40 | 1.95 | 81.00 |
| Aug. 11 | do | do | do | 21.6 | 32.60 | 1.55 | 51.00 |
| Aug. 26 | do | do | do | 23.7 | 28.70 | 1.26 | 36.00 |
| Sept. 17 | do | Cameron Creek | Near Cameron Lake | 13.5 | 6.80 | 0.90 | 6.20 |
| April 12 | do | North Branch Cottonwood Creek | SW. 29-2-29-4 | 19.8 | 10.6 | 0.84 | 8.80 |
| April 12 | do | South Branch Cottonwood Creek | NW. 20-2-29-4 | 14.5 | 11.50 | 0.18 | 2.10 |
| April 28 | do | Cottonwood Creek | SW. 21-2-29-4 | 17.7 | 11.00 | 1.61 | 17.60 |
| May 26 | do | do | do | 19.1 | 20.60 | 3.11 | 64.00 |
| June 30 | do | do | do | 21.0 | 21.10 | 3.17 | 68.00 |
| July 22 | do | do | do | 20.7 | 18.00 | 2.47 | 44.00 |
| Jan. 6 | O. H. Hoover | Crooked Creek | NE. 8-2-29-4 | 10.3 | 3.10 | 1.64 | 5.00 |
| Feb. 3 | W. A. Burton | do | do | 12.5 | 4.88 | 0.72 | 3.53 |
| April 28 | V. A. Newhall | do | NW. 9-2-29-4 | 15.9 | 7.10 | 1.16 | 8.30 |
| May 3 | do | do | do | 19.5 | 20.00 | 3.02 | 60.00 |
| May 27 | do | do | do | 19.0 | 14.80 | 2.27 | 34.00 |
| May 31 | do | do | do | 17.8 | 11.50 | 2.04 | 30.00 |
| June 30 | do | do | do | 19.6 | 22.30 | 2.83 | 63.00 |
| July 22 | do | do | do | 19.4 | 16.70 | 2.14 | 36.00 |
| Aug. 10 | do | do | do | 19.1 | 14.00 | 2.11 | 30.00 |
| Aug. 25 | do | do | do | 19.2 | 14.80 | 2.07 | 31.00 |
| Sept. 22 | do | do | do | 18.9 | 15.30 | 2.02 | 31.00 |
| Oct. 13 | do | do | do | 19.8 | 22.40 | 2.58 | 58.00 |
| Nov. 18 | do | do | do | 17.0 | 10.60 | 1.66 | 17.70 |
| Dec. 12 | W. H. Storey | do | do | 17.0 | 10.50 | 1.55 | 16.20 |
| April 12 | V. A. Newhall | Drywood River | NW. 17-4-29-4 | 25.6 | 18.50 | 1.30 | 24.00 |
| April 29 | do | do | do | 29.0 | 26.90 | 1.90 | 51.00 |
| July 23 | do | do | do | 32.6 | 35.50 | 2.46 | 87.00 |
| April 10 | do | Hell Roaring Creek | Tp. 1-30-4 | 10.1 | 2.40 | 0.45 | 1.08 |
| Sept. 13 | do | do | do | 17.2 | 8.10 | 1.35 | 11.40 |
| Sept. 13 | do | Little Kootenay River | Glacier National Park | 58.0 | 58.4 | 1.33 | 78.00 |
| April 12 | do | Pine Creek | SW. 21-3-29-4 | 17.7 | 8.1 | 1.26 | 10.20 |
| April 29 | do | do | do | 16.1 | 6.7 | 1.11 | 8.40 |
| July 23 | do | do | do | 24.3 | 16.5 | 1.66 | 27.00 |
| April 12 | do | Yarrow Creek | SE. 8-4-29-4 | 26.1 | 23.3 | 1.25 | 29.00 |
| April 29 | do | do | do | 32.2 | 32.3 | 1.90 | 62.00 |
| July 23 | do | do | do | 35.5 | 43.8 | 2.58 | 113.00 |

## BELLY RIVER DRAINAGE BASIN.

*General Description.*

Belly River rises near Chief Mountain in northern Montana. The main stream is augmented on the United States side of the boundary line by Middle Fork and on the Canadian side by North Fork. From the junction with North Fork in Sec. 21, Tp. 1, Rge. 28, W. of the 4th Mer., the river flows in a winding northeasterly course until it joins the Oldman River in Sec. 27, Tp. 9, Rge. 23, W. of the 4th Mer. From this point the stream is now known as the Oldman River although it was formerly called the Belly River until it is joined by the Bow River and forms the South Saskatchewan River.

The topography of the basin is of the most varied character, ranging from the mountainous regions of Montana and the rolling prairie and foothills at the boundary to the level prairie. The upper tributaries drain a forested region; the main stream flows through a deep valley with many clumps of poplar on its banks.

There is an abundant snowfall in the upper portion of the basin, but the precipitation diminishes into semi-arid conditions near the junction with the Oldman River. At first Belly River is a comparatively clear stream, but soon after crossing the boundary line it gradually becomes turbid, especially at the times of high water. The greater portion of the sediment is caused by the washing away of banks and cutting of new channels. Freshets caused by melting snow and heavy rains are frequent in the summer. The maximum flow usually occurs in June or July and after that the flow gradually decreases until it reaches the minimum in January or February.

As yet very little use has been made of the water in this basin. In the upper regions, where water could easily be diverted, it is not required for irrigation purposes and farther downstream it would be an expensive undertaking. There are, however, some small private irrigation schemes diverting water from tributaries of the river.

The Alberta Railway and Irrigation Company has located and may construct a canal from Belly River to supply their irrigation system, if St. Mary River is found deficient. A survey and an estimate of the cost of this proposed canal were made by the Government during 1912, and a copy of the report of this survey may be seen in the report of the Commissioner of Irrigation for 1912. There are also feasible power sites in the upper regions which will no doubt be developed when there is a market.

### BELLY RIVER NEAR MOUNTAIN VIEW.

*Location.*—On the NE. ¼ Sec. 5, Tp. 2, Rge. 28, W. 4th Mer., at John West's ranch.

*Records available.*—November 1, 1911, to December 31, 1915.

*Gauge.*—Vertical staff. Zero of gauge maintained at elevation 4,344.90 feet during 1911–15.

*Bench-mark.*—Permanent iron bench-mark, located on the right bank at the station. Elevation, 4,356.74 feet above mean sea level. (Irrigation Surveys datum.)

*Channel.*—Composed of gravel and sand; not liable to shift, except during flood conditions, on account of the rocky control about 200 feet downstream.

*Discharge measurements.*—Made from a cable car for all open water measurements.

*Winter flow.*—Winter measurements are made about 100 feet above the cable.

*Observer.*—J. N. West, Mountain View post office, Alberta.

DISCHARGE MEASUREMENTS of Belly River near Mountain View, in 1915.

| Date. | Engineer. | Width. | Area Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 5 | O. H. Hoover | 53 | 121 | 0.62 | 2.04 | 76. |
| Feb. 2 | W. A. Burton | 50 | 125 | 0.47 | 1.88 | 59. |
| Feb. 17 | J. E. Degnan | 49 | 108 | 0.48 | 1.80 | 52. |
| Mar. 9 | do | 52 | 116 | 0.25 | 1.50 | 30. |
| April 8 | V. A. Newhall | 85 | 205 | 0.86 | 2.06 | 176. |
| April 27 | do | 88 | 222 | 1.34 | 2.37 | 298. |
| May 24 | do | 93 | 259 | 1.93 | 2.79 | 501. |
| June 1 | do | 95 | 268 | 2.08 | 2.88 | 557. |
| June 28 | do | 98 | 317 | 2.95 | 3.44 | 936. |
| July 19 | do | 94 | 258 | 1.94 | 2.84 | 500. |
| July 26 | do | 94 | 253 | 1.94 | 2.81 | 490. |
| Aug. 9 | do | 90 | 246 | 1.71 | 2.65 | 422. |
| Aug. 16 | do | 88 | 232 | 1.52 | 2.53 | 353. |
| Aug. 27 | do | 84 | 218 | 1.38 | 2.40 | 301. |
| Sept. 11 | do | 86 | 224 | 1.49 | 2.47 | 334. |
| Sept. 24 | do | 87 | 228 | 1.52 | 2.50 | 345. |
| Oct. 13 | do | 86 | 220 | 1.41 | 2.44 | 310. |
| Oct. 15 | do | 86 | 218 | 1.43 | 2.42 | 312. |
| Nov. 17 | W. H. Storey | 82 | 197 | 0.88 | 2.22 | 174. |
| Dec. 11 | do | 76 | 176 | 0.53 | 1.92 | 93. |
| Dec. 31 | do | 57 | 113 | 0.59 | 1.93 | 66. |

DAILY GAUGE HEIGHT AND DISCHARGE of Belly River near Mountain View, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.15*a* | 73 | 1.92 | 62 | 1.74 | 46 | 1.73 | 79 | 2.77 | 488 | 2.96 | 601 |
| 2 | 2.14 | 71 | 1.90 | 61 | 1.75 | 41 | 1.87 | 116 | 3.24 | 796 | 3.00*c* | 626 |
| 3 | 2.16 | 72 | 1.89 | 60 | 1.70 | 35 | 1.85 | 110 | 3.15 | 730 | 3.92 | 1,372 |
| 4 | 2.14 | 74 | 1.90 | 62 | 1.67 | 38 | 1.94 | 137 | 2.90 | 563 | 3.76 | 1,236 |
| 5 | 2.20 | 76 | 1.89 | 63 | 1.70 | 39 | 2.00 | 156 | 2.86 | 540 | 3.83 | 1,292 |
| 6 | 2.18 | 76 | 1.87 | 63 | 1.64 | 38 | 2.01 | 169 | 2.70 | 450 | 3.64 | 1,120 |
| 7 | 2.24 | 76 | 1.85 | 60 | 1.45 | 35 | 2.03 | 166 | 2.77 | 488 | 3.60 | 1,076 |
| 8 | 2.15 | 76 | 1.85 | 60 | 1.72 | 31 | 2.01 | 159 | 3.00 | 626 | 3.37*c* | 874 |
| 9 | 2.14 | 76 | 1.83 | 60 | 1.75 | 29 | 2.00 | 156 | 3.22 | 781 | 3.40 | 898 |
| 10 | 2.12 | 76 | 1.81 | 60 | 1.79 | 32 | 2.00 | 156 | 3.32 | 858 | 3.44 | 932 |
| 11 | 2.10 | 76 | 1.72 | 55 | 1.78 | 32 | 2.00 | 156 | 3.33 | 867 | 3.30 | 818 |
| 12 | 2.01 | 76 | 1.60 | 53 | 1.80 | 33 | 2.00 | 156 | 3.20 | 766 | 3.28 | 802 |
| 13 | 1.84 | 77 | 1.78 | 54 | 1.79 | 34 | 2.15 | 206 | 3.12 | 708 | 3.26 | 787 |
| 14 | 2.11 | 77 | 1.85 | 47 | 1.70 | 33 | 2.20 | 224 | 3.28 | 827 | 3.24 | 771 |
| 15 | 2.10 | 77 | 1.85 | 51 | 1.65 | 32 | 2.30 | 264 | 3.14 | 721 | 3.40 | 898 |
| 16 | 1.87 | 78 | 1.79 | 53 | 1.68 | 32 | 2.48 | 341 | 3.00 | 626 | 3.44 | 932 |
| 17 | 2.00 | 79 | 1.79 | 53 | 1.68*a* | 32 | 2.40 | 304 | 2.95 | 594 | 3.53 | 1,008 |
| 18 | 2.08 | 79 | 1.78 | 54 | 1.76*b* | 86 | 2.55 | 375 | 2.94 | 588 | 3.55 | 1,025 |
| 19 | 2.00 | 79 | 1.79 | 55 | 1.74 | 82 | 2.65 | 425 | 2.84 | 528 | 3.50 | 982 |
| 20 | 1.98 | 79 | 1.75 | 55 | 1.71 | 74 | 2.74 | 472 | 2.76 | 483 | 3.34 | 850 |
| 21 | 1.83 | 77 | 1.76 | 55 | 1.72 | 77 | 2.70 | 450 | 2.70 | 450 | 3.26 | 787 |
| 22 | 1.74 | 67 | 1.75 | 56 | 1.66 | 63 | 2.65 | 425 | 2.65 | 425 | 3.21 | 748 |
| 23 | 2.14 | 62 | 1.75 | 57 | 1.68 | 68 | 2.54 | 370 | 2.74 | 472 | 3.30 | 818 |
| 24 | 2.13 | 69 | 1.80 | 57 | 1.67 | 65 | 2.51 | 355 | 2.80 | 505 | 3.20 | 740 |
| 25 | 1.96 | 74 | 1.84 | 57 | 1.68 | 68 | 2.46 | 332 | 2.83 | 522 | 3.65 | 1,112 |
| 26 | 1.93 | 72 | 1.75 | 56 | 1.65 | 61 | 2.40 | 304 | 2.85 | 534 | 3.58 | 1,051 |
| 27 | 1.94 | 62 | 1.64 | 53 | 1.60 | 50 | 2.38 | 296 | 2.90 | 563 | 3.60 | 1,068 |
| 28 | 1.96 | 51 | 1.69 | 50 | 1.67 | 65 | 2.35 | 284 | 2.97 | 607 | 3.53 | 1,008 |
| 29 | 1.94 | 60 | ..... | ..... | 1.68 | 68 | 2.34 | 280 | 2.95 | 594 | 3.45 | 940 |
| 30 | 1.94 | 62 | ..... | ..... | 1.67 | 65 | 2.67 | 435 | 2.94 | 588 | 3.36*b* | 866 |
| 31 | 1.90 | 63 | ..... | ..... | 1.74 | 82 | ..... | ..... | 2.95 | 594 | ..... | ..... |

*a* to *a* Ice conditions.
*b* to *b* Open water conditions.
*c* to *c* Period of shifting section.

DAILY GAUGE HEIGHT AND DISCHARGE of Belly River near Mountain View, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.47*b* | 957 | 2.91 | 546 | 2.30 | 260 | 2.36 | 284 | 2.33*d* | 272 | 2.04 | 126 |
| 2 | 3.51 | 991 | 2.88 | 529 | 2.56 | 370 | 2.53 | 356 | 2.31 | 264 | 2.13 | 133 |
| 3 | 3.35 | 858 | 2.84 | 507 | 2.50 | 343 | 2.76 | 465 | 2.29 | 256 | 2.18 | 136 |
| 4 | 3.23 | 763 | 2.78 | 475 | 2.50 | 343 | 2.78 | 475 | 2.27 | 249 | 2.13 | 140 |
| 5 | 3.24 | 771 | 2.70 | 435 | 2.50 | 343 | 2.71 | 440 | 2.27 | 219 | 1.93 | 140 |
| 6 | 3.25 | 779 | 2.68 | 426 | 2.52 | 352 | 2.65 | 412 | 2.27 | 249 | 2.08 | 138 |
| 7 | 3.18 | 726 | 2.68 | 426 | 2.50 | 343 | 2.58 | 379 | 2.25 | 242 | 2.08 | 132 |
| 8 | 3.11 | 676 | 2.67 | 421 | 2.50 | 343 | 2.56 | 370 | 2.23 | 234 | 2.11 | 118 |
| 9 | 3.09 | 662 | 2.65 | 412 | 2.70 | 435 | 2.52 | 352 | 2.22 | 230 | 2.18 | 106 |
| 10 | 3.04 | 629 | 2.65 | 412 | 2.73 | 450 | 2.50 | 343 | 2.19 | 220 | 2.12 | 98 |
| 11 | 3.00 | 602 | 2.62 | 397 | 2.47 | 330 | 2.47 | 330 | 2.19 | 220 | 1.92 | 92 |
| 12 | 2.88 | 529 | 2.61 | 393 | 2.40 | 300 | 2.47 | 330 | 2.10 | 188 | 2.10 | 88 |
| 13 | 2.85 | 512 | 2.60 | 388 | 2.34 | 276 | 2.44 | 317 | 2.03 | 166 | 2.20 | 86 |
| 14 | 2.80 | 485 | 2.57 | 374 | 2.30 | 260 | 2.43 | 313 | 2.09 | 182 | 2.27 | 85 |
| 15 | 2.75 | 460 | 2.54 | 361 | 2.29 | 256 | 2.43 | 313 | 2.27 | 249 | 2.17 | 85 |
| 16 | 2.74 | 455 | 2.53 | 356 | 2.30 | 260 | 2.43 | 313 | 2.03*b* | 166 | 2.27 | 86 |
| 17 | 2.92 | 552 | 2.51 | 348 | 2.30 | 260 | 2.42 | 309 | 2.22*a* | 174 | 2.32 | 88 |
| 18 | 3.00 | 602 | 2.50 | 343 | 2.30 | 260 | 2.41 | 304 | 2.41 | 174 | 2.27 | 89 |
| 19 | 2.82 | 496 | 2.49 | 339 | 2.84 | 507 | 2.40 | 300 | 2.38 | 173 | 2.37 | 92 |
| 20 | 2.82 | 496 | 2.55 | 366 | 2.80 | 485 | 2.38 | 292 | 1.98 | 173 | 2.37 | 93 |
| 21 | 2.79 | 480 | 2.51 | 348 | 2.60 | 388 | 2.36 | 284 | 1.92 | 173 | 2.32 | 93 |
| 22 | 2.80 | 485 | 2.47 | 330 | 2.50 | 343 | 2.35 | 280 | 1.93 | 173 | 2.42 | 92 |
| 23 | 2.80 | 485 | 2.46 | 326 | 2.61 | 393 | 2.35 | 280 | 2.03 | 173 | 2.27 | 87 |
| 24 | 2.79 | 480 | 2.45 | 321 | 2.48 | 334 | 2.35 | 280 | 2.08 | 172 | 2.27 | 79 |
| 25 | 2.77 | 470 | 2.44 | 317 | 2.45 | 321 | 2.34 | 276 | 2.02 | 167 | 2.47 | 77 |
| 26 | 2.81 | 490 | 2.42 | 309 | 2.42 | 309 | 2.34 | 276 | 2.09 | 161 | 2.37 | 83 |
| 27 | 3.00 | 602 | 2.41 | 304 | 2.40 | 300 | 2.34 | 276 | 2.09 | 152 | 2.37 | 84 |
| 28 | 2.93 | 559 | 2.40 | 300 | 2.37 | 288 | 2.35 | 280 | 2.05 | 131 | 2.37 | 77 |
| 29 | 3.00 | 602 | 2.39 | 296 | 2.36 | 284 | 2.35 | 280 | 2.05 | 124 | 2.37 | 66 |
| 30 | 2.97 | 583 | 2.38 | 292 | 2.36 | 284 | 2.35 | 280 | 2.09 | 124 | 2.47 | 61 |
| 31 | 3.00 | 602 | 2.35 | 280 | ..... | ..... | 2.34 | 276 | ..... | ..... | 1.93*a* | 66 |

*a* to *a* Ice conditions.
*b* to *b* Open water conditions.
*d* Estimated gauge height.

MONTHLY DISCHARGE of Belly River near Mountain View, for 1915.

(Drainage area 121 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 79 | 51 | 72 | 0.595 | 0.69 | 4,427 |
| February | 63 | 47 | 56 | 0.463 | 0.48 | 3,110 |
| March | 86 | 29 | 51 | 0.421 | 0.49 | 3,136 |
| April | 472 | 79 | 262 | 2.157 | 2.41 | 15,590 |
| May | 867 | 425 | 609 | 5.033 | 5.80 | 37,446 |
| June | 1,372 | 601 | 934 | 7.719 | 8.61 | 55,577 |
| July | 991 | 455 | 608 | 5.025 | 5.79 | 37,384 |
| August | 546 | 280 | 376 | 3.107 | 3.58 | 23,119 |
| September | 507 | 256 | 334 | 2.760 | 3.08 | 19,874 |
| October | 475 | 276 | 325 | 2.686 | 3.10 | 19,983 |
| November | 272 | 124 | 196 | 1.620 | 1.81 | 11,663 |
| December | 140 | 61 | 97 | 0.804 | 0.93 | 5,983 |
| The year | ..... | ..... | ..... | ..... | 36.77 | 237,292 |

MAMI CREEK AT MOUNTAIN VIEW.

*Location.*—On the SE. ¼ Sec. 19, Tp. 2, Rge. 27, W. 4th Mer.

*Records available.*—August 13, 1909, to October 31, 1915.

*Gauge.*—Vertical staff on bridge pier. Zero of gauge maintained at elevation 93.06 during 1909–1915.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Composed of stones covered with sand and gravel not liable to shift, except in high floods.

*Discharge measurements.*—Made by wading.

*Winter flow.*—Records are discontinued during winter season.

*Observer.*—C. H. Findlay, Mountain View, Alta.

DISCHARGE MEASUREMENTS of Mami Creek at Mountain View, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft* |
| April 7 | V. A. Newhall | 12.9 | 7.25 | 1.49 | 2.35 | 10.8 |
| April 26 | do | 11.9 | 5.26 | 1.11 | 2.19 | 5.8 |
| May 24 | do | 14.5 | 12.74 | 1.88 | 2.53 | 24.0 |
| June 28 | do | 27.5 | 32.68 | 1.78 | 2.45 | 58.0 |
| July 19 | do | 27.5 | 27.97 | 1.72 | 2.34 | 48.0 |
| Aug. 9 | do | 27.3 | 21.25 | 1.08 | 2.05 | 23.0 |
| Aug. 28 | do | 15.0 | 10.54 | 1.23 | 1.84 | 13.0 |
| Sept. 10 | do | 17.0 | 14.18 | 1.64 | 2.05 | 23.0 |
| Sept. 24 | do | 17.0 | 12.78 | 1.56 | 1.97 | 20.0 |
| Oct. 12 | do | 19.2 | 17.06 | 1.93 | 2.21 | 33.0 |
| Oct. 15 | do | 18.8 | 17.47 | 2.32 | 2.23 | 41.0 |

DAILY GAUGE HEIGHT AND DISCHARGE of Mami Creek at Mountain View, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.57 | 28.0 | 2.77 | 50.0 | 2.34 | 10.5 |
| 2 | ..... | ..... | 2.55 | 26.0 | 2.60 | 31.0 | 2.41 | 14.1 |
| 3 | ..... | ..... | 2.53 | 24.0 | 2.56 | 27.0 | 4.30*c* | 244.0 |
| 4 | ..... | ..... | 2.50 | 21.0 | 2.50 | 21.0 | 3.25 | 124.0 |
| 5 | ..... | ..... | 2.48 | 19.4 | 2.52 | 23.0 | 3.15 | 125.0 |
| 6 | ..... | ..... | 2.47 | 18.5 | 2.45 | 16.9 | 3.08 | 123.0 |
| 7 | ..... | ..... | 2.43 | 15.5 | 2.40 | 13.5 | 3.02 | 122.0 |
| 8 | ..... | ..... | 2.40 | 13.5 | 2.35 | 10.9 | 2.95*c* | 109.0 |
| 9 | ..... | ..... | 2.36 | 11.4 | 2.33 | 10.1 | 3.60 | 174.0 |
| 10 | ..... | ..... | 2.31 | 9.4 | 2.32 | 9.8 | 3.30 | 145.0 |
| 11 | ..... | ..... | 2.28 | 8.3 | 2.30 | 9.0 | 3.22 | 137.0 |
| 12 | ..... | ..... | 2.28 | 8.3 | 2.28 | 8.3 | 3.02 | 116.0 |
| 13 | ..... | ..... | 2.28 | 8.3 | 2.25 | 7.3 | 3.10 | 124.0 |
| 14 | ..... | ..... | 2.28 | 8.3 | 2.72 | 44.0 | 3.20 | 135.0 |
| 15 | ..... | ..... | 2.41 | 14.2 | 2.95 | 71.0 | 3.10 | 124.0 |
| 16 | ..... | ..... | 2.39 | 13.0 | 2.85 | 59.0 | 3.07 | 121.0 |
| 17 | ..... | ..... | 2.36 | 11.4 | 2.78 | 51.0 | 3.10 | 124.0 |
| 18 | ..... | ..... | 2.32 | 9.8 | 2.85 | 59.0 | 3.39 | 154.0 |
| 19 | ..... | ..... | 2.29 | 8.7 | 2.75 | 48.0 | 3.35 | 150.0 |
| 20 | ..... | ..... | 2.25 | 7.3 | 2.70 | 42.0 | 2.65 | 79.0 |
| 21 | ..... | ..... | 2.24 | 7.0 | 2.65 | 36.0 | 2.55 | 68.0 |
| 22 | ..... | ..... | 2.22 | 6.5 | 2.60 | 31.0 | 2.45 | 58.0 |
| 23 | ..... | ..... | 2.21 | 6.3 | 2.57 | 28.0 | 2.37 | 50.0 |
| 24 | ..... | ..... | 2.21 | 6.3 | 2.54 | 25.0 | 2.25 | 39.0 |
| 25 | ..... | ..... | 2.21 | 6.3 | 2.54 | 25.0 | 3.30 | 145.0 |
| 26 | ..... | ..... | 2.19 | 5.8 | 2.47 | 18.5 | 2.65 | 79.0 |
| 27 | ..... | ..... | 2.18 | 5.5 | 2.45 | 16.9 | 2.65 | 79.0 |
| 28 | 2.67 | 39 | 2.16 | 5.0 | 2.42 | 14.9 | 2.54 | 67.0 |
| 29 | 2.66 | 38 | 2.20 | 6.0 | 2.42 | 14.9 | 2.35 | 48.0 |
| 30 | 2.65 | 36 | 2.60 | 31.0 | 2.40 | 13.5 | 2.35 | 48.0 |
| 31 | 2.60 | 31 | ..... | ..... | 2.38 | 12.5 | ..... | |

*c* to *c* Shifting conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Mami Creek at Mountain View, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.35 | 48.0 | 2.55 | 68.0 | 1.75 | 9.6 | 1.73 | 8.9 |
| 2 | 2.35 | 48.0 | 2.37 | 50.0 | 1.90 | 15.6 | 1.90 | 15.6 |
| 3 | 2.35 | 48.0 | 2.34 | 47.0 | 2.30 | 44.0 | 1.95 | 17.9 |
| 4 | 2.25 | 39.0 | 2.30 | 44.0 | 2.15 | 30.0 | 2.05 | 24.0 |
| 5 | 2.15 | 30.0 | 2.15 | 30.0 | 2.00 | 20.0 | 2.05 | 24.0 |
| 6 | 2.08 | 25.0 | 2.10 | 27.0 | 1.85 | 13.4 | 2.10 | 27.0 |
| 7 | 2.08 | 25.0 | 2.10 | 27.0 | 1.79 | 11.0 | 2.10 | 27.0 |
| 8 | 2.12 | 28.0 | 2.00 | 20.0 | 1.75 | 9.6 | 2.10 | 27.0 |
| 9 | 2.15 | 30.0 | 1.98 | 19.5 | 1.88 | 14.7 | 2.10 | 27.0 |
| 10 | 2.10 | 27.0 | 1.90 | 15.6 | 2.05 | 24.0 | 2.05 | 24.0 |
| 11 | 2.00 | 20.0 | 1.90 | 15.6 | 2.00 | 20.0 | 2.15 | 30.0 |
| 12 | 1.99 | 20.0 | 1.98 | 19.5 | 2.00 | 20.0 | 2.20 | 34.0 |
| 13 | 1.99 | 20.0 | 1.98 | 19.5 | 2.00 | 20.0 | 2.15 | 30.0 |
| 14 | 2.00 | 20.0 | 1.98 | 19.5 | 2.00 | 20.0 | 2.25 | 39.0 |
| 15 | 1.99 | 20.0 | 1.98 | 19.5 | 1.97 | 18.9 | 2.27 | 41.0 |
| 16 | 1.99 | 20.0 | 1.94 | 17.4 | 1.95 | 17.9 | 2.30 | 44.0 |
| 17 | 2.75 | 89.0 | 1.91 | 16.1 | 1.85 | 13.4 | 2.25 | 39.0 |
| 18 | 2.70 | 84.0 | 1.89 | 15.2 | 1.83 | 12.6 | 2.10 | 27.0 |
| 19 | 2.34 | 47.0 | 1.85 | 13.4 | 1.83 | 12.6 | 2.10 | 27.0 |
| 20 | 2.50 | 63.0 | 3.00 | 114.0 | 1.83 | 12.6 | 2.10 | 27.0 |
| 21 | 2.09 | 26.0 | 2.35 | 48.0 | 1.83 | 12.6 | 2.05 | 24.0 |
| 22 | 1.90 | 15.6 | 2.20 | 34.0 | 1.83 | 12.6 | 2.05 | 24.0 |
| 23 | 2.00 | 20.0 | 2.05 | 24.0 | 1.82 | 12.2 | 2.00 | 20.0 |
| 24 | 2.10 | 27.0 | 2.05 | 24.0 | 1.97 | 18.9 | 1.97 | 18.9 |
| 25 | 2.10 | 27.0 | 2.05 | 24.0 | 1.96 | 18.4 | 1.95 | 17.9 |
| 26 | 2.79 | 93.0 | 1.99 | 20.0 | 1.92 | 16.5 | 1.95 | 17.9 |
| 27 | 2.50 | 63.0 | 1.94 | 17.4 | 1.87 | 14.3 | 1.93 | 17.0 |
| 28 | 2.70 | 84.0 | 1.96 | 18.4 | 2.00 | 20.0 | 1.91 | 16.1 |
| 29 | 2.65 | 79.0 | 1.91 | 16.1 | 1.91 | 16.1 | 1.90 | 15.6 |
| 30 | 2.50 | 63.0 | 1.85 | 13.4 | 1.75 | 9.6 | 1.90 | 15.6 |
| 31 | 2.45 | 58.0 | 1.80 | 11.4 | ..... | ..... | 1.89 | 15.2 |

MONTHLY DISCHARGE of Mami Creek at Mountain View, for 1915.

(Drainage area 22 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (28–31) | 39.0 | 31.0 | 36.0 | 1.64 | 0.244 | 285 |
| April | 28.0 | 5.0 | 12.3 | 0.56 | 0.625 | 732 |
| May | 71.0 | 7.3 | 27.4 | 1.25 | 1.441 | 1,685 |
| June | 244.0 | 10.5 | 104.5 | 4.75 | 5.300 | 6,218 |
| July | 93.0 | 15.6 | 42.1 | 1.91 | 2.202 | 2,588 |
| August | 114.0 | 11.4 | 28.0 | 1.27 | 1.464 | 1,722 |
| September | 44.0 | 9.6 | 17.0 | 0.77 | 0.859 | 1,012 |
| October | 44.0 | 8.9 | 24.6 | 1.12 | 1.291 | 1,513 |
| The period | ..... | ..... | ..... | ..... | 13.426 | 15,755 |

CHRISTIANSON DITCH NEAR MOUNTAIN VIEW.

*Location.*—On the SE. ¼ Sec. 12, Tp. 3, Rge. 28, W. 4th Mer.

*Records available.*—May 17, to July 1, 1913. One discharge measurement only in 1914. Ditch not used in 1915.

*Gauge.*—Vertical staff. Elevation of zero, 96.04 feet.

*Bench-mark.*—Wooden stake, left bank. Assumed elevation, 100.00 feet.

*Observer.*—No observations in 1914 or 1915.

BELLY RIVER NEAR STAND OFF.

*Location.*—On the SE. ¼ Sec. 21, Tp. 6, Rge. 25, W. 4th Mer., near Stand Off.

*Records available.*—May 27, 1909, to December 31, 1915.

*Gauge.*—Chain gauge from bank. Zero of gauge maintained at 92.51 during 1909–12. Zero of gauge maintained at 91.82 during 1913. Zero of gauge maintained at 90.82 during 1914–15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Composed of clean gravel and small stone; not liable to shift.

*Discharge measurements.*—Made by wading at low stages and from the traffic bridge on the NE. ¼ Sec. 21, Tp. 6, Rge. 25, W. 4th Mer. at high stages.

*Winter flow.*—Measurements through the ice are made at a point 150 feet below the chain gauge.

*Observer.*—George Pearson.

DISCHARGE MEASUREMENTS of Belly River near Stand Off, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 8 | O. H. Hoover | 36 | 50.0 | 1.54 | 1.62 | 77 |
| Jan. 29 | W. A. Burton | 34 | 40.0 | 1.41 | 1.52 | 56 |
| Feb. 22 | J. E. Degnan | 34 | 40.6 | 1.38 | 1.62 | 56 |
| Mar. 12 | do | 34 | 39.0 | 1.46 | 1.87 | 57 |
| Mar. 31 | do | 83 | 121.0 | 1.29 | 2.28 | 155 |
| April 14 | V. A. Newhall | 85 | 134.0 | 1.53 | 2.44 | 204 |
| May 20 | do | 92 | 224.4 | 2.97 | 3.25 | 668 |
| June 8 | do | 94 | 302.8 | 4.27 | 3.98 | 1,295 |
| July 7 | do | 92 | 255.7 | 3.40 | 3.55 | 870 |
| Aug. 2 | do | 86 | 254.9 | 3.37 | 3.47 | 860 |
| Aug. 23 | do | 88 | 207.0 | 2.54 | 3.05 | 527 |
| Sept. 29 | do | 87 | 171.9 | 2.09 | 2.82 | 359 |
| Nov. 6 | do | 87 | 161.6 | 1.88 | 2.73 | 304 |
| Dec. 2 | W. H. Storey | 86 | 146.8 | 0.92 | 2.22 | 136 |
| Dec. 20 | do | 86 | 73.2 | 0.65 | 1.83 | 48 |

DAILY GAUGE HEIGHT AND DISCHARGE of Belly River near Stand Off, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.66*a* | 79 | 1.55 | 55 | 1.62 | 51 | 2.26 | 154 | 3.04 | 478 | 3.19 | 577 |
| 2 | 1.66 | 82 | 1.55 | 58 | 1.63 | 50 | 2.27 | 157 | 3.43 | 762 | 3.19 | 577 |
| 3 | 1.67 | 82 | 1.55 | 60 | 1.65 | 49 | 2.30 | 164 | 3.45 | 780 | 3.18 | 570 |
| 4 | 1.67 | 80 | 1.57 | 62 | 1.65 | 49 | 2.35 | 179 | 3.30 | 658 | 4.79 | 2,208 |
| 5 | 1.68 | 77 | 1.58 | 61 | 1.68 | 49 | 2.44 | 207 | 3.34 | 689 | 4.59 | 1,974 |
| 6 | 1.66 | 75 | 1.58 | 58 | 1.70 | 50 | 2.42 | 200 | 2.97 | 437 | 4.45 | 1,813 |
| 7 | 1.64 | 75 | 1.58 | 56 | 1.70 | 50 | 2.41 | 197 | 2.93 | 413 | 4.09 | 1,410 |
| 8 | 1.64 | 77 | 1.58 | 54 | 1.70 | 50 | 2.40 | 194 | 3.04 | 478 | 3.98 | 1,294 |
| 9 | 1.69 | 77 | 1.58 | 54 | 1.70 | 51 | 2.39 | 191 | 3.38 | 720 | 3.85 | 1,160 |
| 10 | 1.67 | 76 | 1.58 | 55 | 1.70 | 52 | 2.39 | 191 | 3.46 | 789 | 4.24 | 1,574 |
| 11 | 1.63 | 74 | 1.58 | 56 | 1.72 | 54 | 2.39 | 191 | 3.54 | 861 | 4.19 | 1,519 |
| 12 | 1.60 | 72 | 1.56 | 58 | 1.82 | 56 | 2.39 | 191 | 3.62 | 935 | 4.03 | 1,346 |
| 13 | 1.60 | 70 | 1.54 | 59 | 1.83 | 60 | 2.42 | 200 | 3.69 | 1,001 | 3.80 | 1,110 |
| 14 | 1.65 | 68 | 1.49 | 60 | 2.70*d* | 65 | 2.49 | 223 | 3.71 | 1,020 | 4.15 | 1,475 |
| 15 | 1.65 | 66 | 1.52 | 59 | 3.66*d* | 71 | 2.60 | 262 | 3.92 | 1,231 | 4.17 | 1,497 |
| 16 | 1.65 | 65 | 1.58 | 57 | 4.62*d* | 80 | 2.60 | 262 | 3.73 | 1,040 | 4.25 | 1,585 |
| 17 | 1.63 | 64 | 1.65 | 55 | 5.58 | 89 | 2.65 | 282 | 3.57 | 888 | 4.05 | 1,368 |
| 18 | 1.60 | 63 | 1.71 | 55 | 6.08 | 99 | 2.76 | 328 | 3.41 | 745 | 4.02 | 1,336 |
| 19 | 1.57 | 62 | 1.75 | 55 | 5.63 | 108 | 2.84 | 366 | 3.33 | 681 | 4.88 | 2,316 |
| 20 | 1.54 | 60 | 1.78 | 55 | 4.08 | 116 | 3.00 | 454 | 3.24 | 614 | 4.13 | 1,453 |
| 21 | 1.52 | 59 | 1.79 | 56 | 3.37*a* | 121 | 3.00 | 454 | 3.17 | 563 | 3.60 | 916 |
| 22 | 1.50 | 58 | 1.72 | 56 | 2.42*b* | 200 | 3.10 | 514 | 3.06 | 490 | 3.60 | 916 |
| 23 | 1.48 | 58 | 1.71 | 57 | 2.38 | 188 | 3.00 | 454 | 3.02 | 466 | 3.65 | 963 |
| 24 | 1.35 | 58 | 1.69 | 57 | 2.35 | 179 | 2.90 | 396 | 3.02 | 466 | 3.69 | 1,001 |
| 25 | 1.44 | 58 | 1.69 | 56 | 2.33 | 173 | 2.82 | 356 | 3.14 | 542 | 3.76 | 1,070 |
| 26 | 1.46 | 57 | 1.69 | 56 | 2.33 | 173 | 2.70 | 302 | 3.14 | 542 | 5.20 | 2,700 |
| 27 | 1.48 | 56 | 1.68 | 55 | 2.28 | 159 | 2.66 | 286 | 3.10 | 514 | 4.93 | 2,376 |
| 28 | 1.52 | 56 | 1.64 | 54 | 2.25 | 152 | 2.65 | 282 | 3.11 | 521 | 4.24 | 1,574 |
| 29 | 1.54 | 56 | ..... | ..... | 2.23 | 147 | 2.65 | 282 | 3.18 | 570 | 3.93 | 1,242 |
| 30 | 1.54 | 56 | ..... | ..... | 2.24 | 150 | 2.73 | 315 | 3.18 | 570 | 3.80*b* | 1,110 |
| 31 | 1.54 | 55 | ..... | ..... | 2.26 | 154 | ..... | ..... | 3.19 | 577 | ..... | ..... |

*a* to *a* Ice conditions.
*b* to *b* Open water conditions.
*d* Estimated gauge height.

DAILY GAUGE HEIGHT AND DISCHARGE of Belly River near Stand Off, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 4.18 | 1,508 | 3.56 | 879 | 2.70 | 302 | .....*a* | 360 | 2.76 | 328 | 2.26*d* | 141 |
| 2 | 4.05 | 1,368 | 3.43 | 762 | 2.80 | 346 | ..... | 380 | 2.75 | 324 | 2.22 | 136 |
| 3 | 3.96 | 1,273 | 3.31 | 666 | 3.90 | 1,210 | ..... | 399 | 2.76 | 328 | 2.23 | 133 |
| 4 | 3.89 | 1,200 | 3.24 | 613 | 3.60 | 916 | ..... | 471 | 2.71 | 306 | .....*b* | 132 |
| 5 | 3.65 | 963 | 3.18 | 570 | 3.56 | 879 | .....*a* | 580 | 2.72 | 311 | ..... | 132 |
| 6 | 3.60 | 916 | 3.15 | 549 | 3.12 | 528 | 3.33 | 681 | 2.73*b* | 315 | ..... | 132 |
| 7 | 3.55 | 870 | 3.05 | 484 | 3.09 | 508 | 3.33 | 681 | 2.73*c* | 293 | ..... | 132 |
| 8 | 3.51 | 833 | 3.05 | 484 | 3.03 | 472 | 3.31 | 666 | 2.72 | 283 | ..... | 130 |
| 9 | 3.47 | 798 | 3.01 | 460 | 2.91 | 402 | .....*a* | 590 | 2.72 | 273 | ..... | 129 |
| 10 | 3.43 | 762 | 2.98 | 442 | 2.90 | 396 | ..... | 500 | 2.72 | 262 | ..... | 124 |
| 11 | 3.34 | 689 | 2.98 | 442 | 2.90 | 396 | ..... | 467 | 2.73 | 250 | ..... | 95 |
| 12 | 3.32 | 674 | 2.96 | 431 | 2.90 | 396 | ..... | 458 | 2.75 | 240 | ..... | 78 |
| 13 | 3.30 | 658 | 2.96 | 431 | 2.84 | 366 | ..... | 445 | 2.77 | 233 | ..... | 76 |
| 14 | 2.98 | 442 | 2.94 | 419 | 2.78 | 337 | ..... | 445 | 2.75 | 232 | ..... | 75 |
| 15 | 2.98 | 442 | 2.94 | 419 | 2.78 | 337 | ..... | 432 | 2.73 | 230 | ..... | 72 |
| 16 | 2.98 | 442 | 2.94 | 419 | 2.78 | 337 | ..... | 428 | 2.74 | 230 | ..... | 69 |
| 17 | 3.00 | 454 | 2.94 | 419 | 2.77 | 333 | ..... | 428 | 2.72 | 232 | ..... | 65 |
| 18 | 3.78 | 1,090 | 2.94 | 419 | 2.75 | 324 | ..... | 428 | 2.71 | 230 | ..... | 60 |
| 19 | 3.54 | 861 | 2.89 | 391 | 2.98 | 442 | ..... | 424 | 2.69 | 230 | ...*b*... | 54 |
| 20 | 3.38 | 726 | 4.70 | 2,100 | 2.98 | 442 | ..... | 419 | 2.68 | 223 | 1.83 | 48 |
| 21 | 3.29 | 651 | 4.10 | 1,420 | 2.99 | 448 | ..... | 400 | 2.62 | 212 | .....*b* | 47 |
| 22 | 3.15 | 549 | 3.98 | 1,294 | 2.99 | 448 | ..... | 375 | 2.60 | 207 | ..... | 47 |
| 23 | 3.15 | 549 | 3.04 | 478 | 2.97 | 437 | ..... | 350 | 2.58 | 207 | ..... | 46 |
| 24 | 3.15 | 549 | 3.04 | 478 | 2.96 | 431 | ..... | 345 | 2.53 | 207 | ..... | 46 |
| 25 | 3.15 | 549 | 3.00 | 454 | 2.87 | 381 | ..... | 345 | 2.48 | 206 | ..... | 46 |
| 26 | 3.15 | 549 | 2.91 | 402 | 2.80 | 346 | ..... | 345 | 2.46 | 203 | ..... | 46 |
| 27 | 3.29 | 651 | 2.80 | 346 | 2.80 | 346 | ..... | 340 | 2.43 | 200 | ..... | 45 |
| 28 | 4.39 | 1,744 | 2.74 | 320 | 2.81 | 351 | ..... | 340 | 2.40 | 190 | ..... | 45 |
| 29 | 4.56 | 1,939 | 2.74 | 320 | 2.82 | 356 | ..... | 340 | 2.36*d* | 173 | ..... | 45 |
| 30 | 3.91 | 1,220 | 2.74 | 320 | 2.77 | 333 | .....*a* | 340 | 2.31*d* | 152 | ..... | 45 |
| 31 | 3.76 | 1,070 | 2.70 | 302 | ..... | ..... | 2.77 | 333 | ..... | ..... | ..... | 45 |

*a* to *a* No gauge heights available; discharges are estimated from those at West s Ranch.
*b* to *b* No gauge heights available; discharges are estimates under ice conditions.
*d* Estimated gauge height.

MONTHLY DISCHARGE of Belly River near Stand Off, for 1915.

(Drainage area 461 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 82 | 55 | 67 | 0.145 | 0.17 | 4,120 |
| February | 62 | 54 | 57 | 0.124 | 0.13 | 3,166 |
| March | 200 | 49 | 100 | 0.217 | 0.25 | 6,149 |
| April | 514 | 154 | 274 | 0.594 | 0.66 | 6,304 |
| May | 1,231 | 413 | 679 | 1.472 | 1.70 | 41,750 |
| June | 2,700 | 570 | 1,401 | 3.039 | 3.39 | 83,305 |
| July | 1,939 | 442 | 870 | 1.887 | 2.18 | 53,494 |
| August | 2,100 | 302 | 578 | 1.254 | 1.44 | 35,540 |
| September | 1,210 | 302 | 452 | 0.980 | 1.09 | 26,896 |
| October | 681 | 333 | 437 | 0.948 | 1.09 | 26,870 |
| November | 328 | 153 | 244 | 0.529 | 0.59 | 14,519 |
| December | 141 | 45 | 81 | 0.176 | 0.20 | 4,980 |
| The year | ..... | ..... | ..... | ..... | 12.89 | 307,093 |

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Belly River drainage basin, in 1915.

| Date. | Engineer. | Stream. | Location. | Width. | Area of Section. | Mean Velocity. | Discharge. |
|---|---|---|---|---|---|---|---|
| | | | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Sec.-ft.* |
| Aug. 14.... | V. A. Newhall.... | South Branch of Belly River..... | Glacier National Park..... | 59.5 | 65.8 | 1.76 | 116 |
| Aug. 14.... | do .... | Middle Branch of Belly River..... | do | 50.0 | 52.2 | 2.72 | 146 |
| Aug. 16.... | do .... | South Fork of North Branch of Belly River..... | Waterton Park.... | 24.5 | 26.5 | 1.21 | 33 |
| Aug. 16.... | do .... | North Fork of North Branch of Belly River..... | do .... | 31.5 | 14.9 | 1.48 | 22 |

## ST. MARY RIVER DRAINAGE BASIN.

### *General Description.*

St. Mary River, an important tributary of the Oldman River and thus indirectly of the South Saskatchewan River, heads in northern Montana on the eastern slope of the main range of the Rocky Mountains. It starts from the great Blackfoot glacier and receives affluents from numerous lesser glaciers. These streams unite within a short distance from their source and flow into Upper St. Mary Lake. Below this lake and in close proximity, is Lower St. Mary Lake, the aggregate lengths of the two being about 22 miles. The river flows out of the lower lake, at an elevation of 4,460 feet above mean sea level, and takes a northerly course through the foothills to the international boundary. From the boundary it flows in a north and easterly direction through a rolling country, finally emptying into the Oldman River near Lethbridge, Alta.

The basin is bounded on the south by the Rocky Mountains, on the west by the watershed between Belly and St. Mary Rivers and on the east by the watershed between Milk and St. Mary Rivers. The upper portion of the basin is heavily timbered and receives a large precipitation mostly in the shape of snowfall; the lower and major portion is totally devoid of tree growth and has a small precipitation.

The river flows through a very deep valley having steep banks making the diversion of water from this stream for irrigation an expensive undertaking. In Canada the Alberta Railway and Irrigation Company has water rights on this river. The headgates of their canal are at Kimball, five miles north of the boundary, and they already have many miles of ditch constructed, which irrigates land surrounding Lethbridge.

As this is an international river, discharge measurements are taken on it by both the Canadian and American governments. The engineers of both countries use a common gauging station near Kimball.

#### FIDLER BROTHERS' DITCH FROM BOUNDARY CREEK.

*Location.*—On the SE. ¼ Sec. 19, Tp. 1, Rge. 26, W. 4th Mer.
*Records available.*—September 13, 1911, to July 13, 1914. Ditch not used in 1915.
*Gauge.*—Vertical staff.
*Bench-mark.*—Wooden plug on the left bank 8 feet west of the gauge. Elevation, 3.90 feet above zero of the gauge.
*Channel.*—Consists of sand and clay.
*Discharge measurements.*—Made by current-meter.
*Observer.*—Jos. Fidler.

#### BOUNDARY CREEK AT FIDLER BROTHERS' RANCH.

*Location.*—On the NW. ¼ Sec. 20, Tp. 1, Rge. 26, W. 4th Mer.
*Records available.*—June 18, 1913, to October 31, 1915.
*Gauge.*—Vertical staff. Zero of gauge maintained at 96.98 feet during 1913. Zero of gauge maintained at 95.06 feet during 1914–15.
*Bench-mark.*—Permanent iron bench-mark located 25 feet from edge of left bank, and 20 feet downstream from the gauge. Assumed elevation, 100.00 feet.
*Channel.*—Consists of fine gravel, stone and clay; not liable to shift.
*Discharge measurements.*—Made by wading.
*Winter flow.*—Records are discontinued during the winter season.
*Observer.*—James Fidler, Boundary Creek post office, Alta.

DISCHARGE MEASUREMENTS of Boundary Creek at Fidler Brothers' Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 26 | V. A. Newhall | 12.5 | 11.34 | 1.10 | 1.70 | 12.4 |
| June 22 | do | 16.2 | 21.93 | 2.70 | 2.27 | 59.0 |
| July 10 | do | 16.0 | 19.16 | 2.16 | 2.14 | 41.0 |
| Aug. 7 | do | 16.3 | 18.77 | 1.94 | 2.07 | 36.0 |
| Sept. 8 | do | 16.2 | 16.35 | 1.21 | 1.91 | 19.8 |
| Oct. 18 | do | 16.2 | 17.16 | 1.47 | 2.00 | 25.0 |

DAILY GAUGE HEIGHT AND DISCHARGE of Boundary Creek at Fidler Brothers' Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.76 | 14.3 | 2.04 | 29.0 | 1.86 | 18.2 |
| 2 | ..... | ..... | 1.78 | 15.0 | 2.07 | 32.0 | 1.94 | 22.0 |
| 3 | ..... | ..... | 1.79 | 15.4 | 2.05 | 30.0 | 2.33 | 68.0 |
| 4 | ..... | ..... | 1.80 | 15.7 | 2.04 | 29.0 | 3.50 | 277.0 |
| 5 | ..... | ..... | 1.82 | 16.5 | 2.04 | 29.0 | 2.58 | 111.0 |
| 6 | ..... | ..... | 1.84 | 17.3 | 2.02 | 28.0 | 2.44 | 86.0 |
| 7 | ..... | ..... | 1.84 | 17.3 | 1.98 | 25.0 | 2.44 | 86.0 |
| 8 | ..... | ..... | 1.86 | 18.2 | 1.96 | 24.0 | 2.42 | 83.0 |
| 9 | ..... | ..... | 1.86 | 18.2 | 1.93 | 22.0 | 2.40 | 79.0 |
| 10 | ..... | ..... | 1.86 | 18.2 | 1.90 | 20.0 | 2.53 | 102.0 |
| 11 | ..... | ..... | 1.86 | 18.2 | 1.88 | 19.1 | 2.56 | 108.0 |
| 12 | ..... | ..... | 1.86 | 18.2 | 1.86 | 18.2 | 2.56 | 108.0 |
| 13 | ..... | ..... | 1.85 | 17.7 | 1.84 | 17.3 | 2.44 | 86.0 |
| 14 | ..... | ..... | 1.85 | 17.7 | 2.11 | 36.0 | 2.42 | 83.0 |
| 15 | ..... | ..... | 1.85 | 17.7 | 2.15 | 41.0 | 2.46 | 90.0 |
| 16 | ..... | ..... | 1.84 | 17.3 | 2.10 | 35.0 | 2.58 | 111.0 |
| 17 | ..... | ..... | 1.84 | 17.3 | 2.10 | 35.0 | 2.58 | 111.0 |
| 18 | 1.89 | 19.5 | 1.83 | 16.9 | 2.14 | 40.0 | 2.54 | 104.0 |
| 19 | 1.88 | 19.1 | 1.82 | 16.5 | 2.15 | 41.0 | 2.52 | 101.0 |
| 20 | 1.90 | 20.0 | 1.80 | 15.7 | 2.11 | 36.0 | 2.38 | 76.0 |
| 21 | 1.90 | 20.0 | 1.79 | 15.4 | 2.08 | 33.0 | 2.26 | 57.0 |
| 22 | 1.90 | 20.0 | 1.78 | 15.0 | 2.06 | 31.0 | 2.28 | 60.0 |
| 23 | 1.89 | 19.5 | 1.76 | 14.3 | 2.04 | 29.0 | 2.24 | 54.0 |
| 24 | 1.90 | 20.0 | 1.74 | 13.7 | 2.02 | 28.0 | 2.23 | 52.0 |
| 25 | 1.78 | 15.0 | 1.74 | 13.7 | 2.02 | 28.0 | 2.44 | 86.0 |
| 26 | 1.76 | 14.3 | 1.70 | 12.4 | 1.97 | 24.0 | 2.58 | 111.0 |
| 27 | 1.76 | 14.3 | 1.68 | 11.8 | 1.94 | 22.0 | 2.59 | 113.0 |
| 28 | 1.76 | 14.3 | 1.66 | 11.3 | 1.92 | 21.0 | 2.45 | 88.0 |
| 29 | 1.75 | 14.0 | 1.66 | 11.3 | 1.90 | 20.0 | 2.29 | 61.0 |
| 30 | 1.74 | 13.7 | 1.67 | 11.6 | 1.90 | 20.0 | 2.24 | 54.0 |
| 31 | 1.74 | 13.7 | ..... | ..... | 1.88 | 19.1 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Boundary Creek at Fidler Brothers' Ranch, for 1915. —*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.54 | 104 | 2.32 | 66.0 | 1.83 | 16.9 | 1.90 | 20.0 |
| 2 | 2.52 | 101 | 2.30 | 63.0 | 1.84 | 17.3 | 1.92 | 21.0 |
| 3 | 2.49 | 95 | 2.26 | 57.0 | 1.86 | 18.2 | 2.00 | 26.0 |
| 4 | 2.29 | 61 | 2.19 | 47.0 | 2.25 | 55.0 | 2.03 | 28.0 |
| 5 | 2.24 | 54 | 2.14 | 40.0 | 2.10 | 35.0 | 2.03 | 28.0 |
| 6 | 2.21 | 49 | 2.10 | 35.0 | 2.00 | 26.0 | 2.05 | 30.0 |
| 7 | 2.19 | 47 | 2.07 | 32.0 | 1.96 | 24.0 | 2.04 | 29.0 |
| 8 | 2.14 | 40 | 2.04 | 29.0 | 1.91 | 21.0 | 2.03 | 28.0 |
| 9 | 2.14 | 40 | 2.03 | 28.0 | 1.95 | 23.0 | 2.00 | 26.0 |
| 10 | 2.14 | 40 | 2.02 | 28.0 | 2.11 | 36.0 | 2.00 | 26.0 |
| 11 | 2.09 | 34 | 2.00 | 26.0 | 2.09 | 34.0 | 2.00 | 26.0 |
| 12 | 2.05 | 30 | 1.98 | 25.0 | 2.06 | 31.0 | 2.02 | 28.0 |
| 13 | 2.04 | 29 | 1.98 | 25.0 | 2.04 | 29.0 | 2.02 | 28.0 |
| 14 | 2.04 | 29 | 2.00 | 26.0 | 2.03 | 28.0 | 1.99 | 25.0 |
| 15 | 2.02 | 28 | 1.98 | 25.0 | 2.00 | 26.0 | 2.02 | 28.0 |
| 16 | 2.02 | 28 | 1.96 | 24.0 | 1.98 | 25.0 | 2.04 | 29.0 |
| 17 | 2.08 | 33 | 1.96 | 24.0 | 1.96 | 24.0 | 2.02 | 28.0 |
| 18 | 2.64 | 122 | 1.94 | 22.0 | 1.95 | 23.0 | 2.00 | 26.0 |
| 19 | 2.55 | 106 | 1.96 | 24.0 | 1.96 | 24.0 | 2.00 | 26.0 |
| 20 | 2.17 | 44 | 2.04 | 29.0 | 1.96 | 24.0 | 1.98 | 25.0 |
| 21 | 2.14 | 40 | 2.01 | 27.0 | 1.94 | 22.0 | 1.96 | 24.0 |
| 22 | 2.11 | 36 | 2.00 | 26.0 | 1.92 | 21.0 | 1.95 | 23.0 |
| 23 | 2.05 | 30 | 1.96 | 24.0 | 1.92 | 21.0 | 1.94 | 22.0 |
| 24 | 2.04 | 29 | 1.94 | 22.0 | 1.94 | 22.0 | 1.93 | 22.0 |
| 25 | 2.05 | 30 | 1.92 | 21.0 | 1.94 | 22.0 | 1.92 | 21.0 |
| 26 | 2.34 | 69 | 1.90 | 20.0 | 1.94 | 22.0 | 1.92 | 21.0 |
| 27 | 2.34 | 69 | 1.88 | 19.1 | 1.94 | 22.0 | 1.93 | 22.0 |
| 28 | 2.34 | 69 | 1.86 | 18.2 | 1.94 | 22.0 | 1.92 | 21.0 |
| 29 | 2.36 | 73 | 1.86 | 18.2 | 1.94 | 22.0 | 1.90 | 20.0 |
| 30 | 2.34 | 69 | 1.84 | 17.3 | 1.92 | 21.0 | 1.89 | 19.5 |
| 31 | 2.32 | 66 | 1.84 | 17.3 | ..... | ..... | 1.88 | 19.1 |

MONTHLY DISCHARGE of Boundary Creek at Fidler Brothers' Ranch, for 1915.

(Drainage area 44 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (18-31) | 20.0 | 13.7 | 17.0 | 0.386 | 0.201 | 472 |
| April | 18.2 | 11.3 | 15.7 | 0.357 | 0.398 | 934 |
| May | 41.0 | 17.3 | 27.8 | 0.632 | 0.729 | 1,709 |
| June | 277.0 | 18.2 | 88.2 | 0 200 | 0.223 | 5,248 |
| July | 122.0 | 28.0 | 54.6 | 1.241 | 1.431 | 3,357 |
| August | 66.0 | 17.3 | 29.2 | 0.664 | 0.766 | 1,795 |
| September | 55.0 | 16.9 | 25.2 | 0.573 | 0.639 | 1,500 |
| October | 30.0 | 19.1 | 24.7 | 0.562 | 0.648 | 1,519 |
| The period | ..... | ..... | ..... | ..... | 5.035 | 16,534 |

ST. MARY RIVER NEAR KIMBALL.

*Location.*—Cable station on SW. ¼ Sec. 25, Tp. 1, Rge. 25, W. 4th Mer., about 2,000 feet above the Alberta Railway & Irrigation Company's dam.

*Records available.*—April 13, 1908, to December 31, 1915.

*Gauges.*—Friez automatic stage recorder, housed in a concrete shelter, about 3,000 feet above the cable station. Zero of automatic gauge maintained at 88.75 feet during 1913–15. Vertical staff at summer cable station. Zero of staff maintained at 85.84 feet during 1914–15. Chain gauge at winter station located at the bridge on the SW. ¼ Sec. 1, Tp. 2, Rge. 25, W 4th Mer. Zero of gauge maintained at 86.97 feet during 1914–15.

*Bench-marks.*—At automatic gauge; a spike on the downstream side of the concrete shelter. Assumed elevation, 100.00 feet. At summer station, a permanent iron bench-mark. Assumed elevation, 100.00 feet. At winter station, a permanent iron bench-mark. Assumed elevation, 100.00 feet; located 131 feet northeast of the right abutment of the bridge.

*Channel.*—Consists of sand and gravel liable to slight shifting conditions.

*Discharge measurements.*—Made from cable car; and by wading in conjunction with measurements from cable car, when water is low enough.

*Winter flow.*—Difficulty is often experienced in obtaining accurate discharge during the winter months owing to slush ice and the formation of more than one layer of ice. Measurements of this season are obtained at the SW. ¼ Sec. 1, Tp. 2, Rge. 25, W. 4th Mer.

*Diversions.*—Alberta Railway & Irrigation Company's canal, capacity about 700 sec.-ft.; below the station about one-half mile.

*Observer.*—J. M. Dunn, Kimball, Alberta.

*Remarks.*—This station is maintained in co-operation with the stream measurement work carried out by the United States Geological Surveys.

DISCHARGE MEASUREMENTS of St. Mary River near Kimball, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 1 | O. H. Hoover | 90 | 196 | 0.92 | 5.04*a* | 181 |
| Jan. 19 | J. E. Degnan | 80 | 143 | 1.05 | 5.46 | 150 |
| Jan. 21 | do | 77 | 132 | 1.22 | 5.15 | 161 |
| Feb. 8 | do | 99 | 50 | 2.39 | 5.29 | 120 |
| Feb. 8 | do | 77 | 149 | 0.96 | 5.29 | 143 |
| Feb. 10 | do | 100 | 49 | 2.31 | 5.19 | 112 |
| Feb. 26 | do | 53 | 80 | 1.44 | 4.78 | 116 |
| Feb. 27 | do | 53 | 78 | 1.51 | 4.88 | 117 |
| Mar. 6 | do | 53 | 77 | 1.30 | 4.70 | 109 |
| Mar. 15 | do | 53 | 88 | 1.54 | 5.03 | 136 |
| Mar. 18 | do | 86 | 131 | 1.92 | 5.28 | 253 |
| Mar. 25 | do | 83 | 100 | 1.41 | 4.53*a* | 141 |
| Mar. 29 | do | 68 | 160 | 1.10 | 1.61*b* | 176 |
| April 2 | do | 89 | 177 | 1.31 | 1.88 | 244 |
| April 3 | do | 164 | 200 | 1.27 | 1.95 | 255 |
| April 19 | V. A. Newhall | 198 | 331 | 2.38 | 2.86 | 788 |
| April 21 | do | 224 | 364 | 2.52 | 3.02 | 918 |
| April 23 | do | 224 | 373 | 2.56 | 3.04 | 954 |
| April 24 | W. A. Lamb (U.S.G.S.) | 223 | 361 | 2.47 | 3.06 | 890 |
| May 5 | V. A. Newhall | 227 | 497 | 3.29 | 3.76 | 1,634 |
| May 10 | do | 229 | 564 | 3.63 | 4.12 | 2,051 |
| May 22 | do | 226 | 449 | 2.96 | 3.50 | 1,326 |
| May 27 | W. A. Lamb (U.S.G.S.) | 229 | 449 | 3.10 | 3.54 | 1,390 |
| June 10 | V. A. Newhall | 230 | 592 | 4.06 | 4.42 | 2,406 |
| June 11 | do | 228 | 541 | 3.73 | 4.21 | 2,020 |
| June 16 | do | 230 | 571 | 3.91 | 4.26 | 2,233 |
| July 12 | do | 228 | 478 | 3.46 | 3.75 | 1,659 |
| July 13 | do | 227 | 456 | 3.31 | 3.67 | 1,512 |
| July 15 | B. E. Jones (U.S.G.S.) | 227 | 434 | 3.18 | 3.56 | 1,380 |
| July 16 | V. A. Newhall | 226 | 430 | 3.14 | 3.50 | 1,350 |
| Aug. 3 | do | 224 | 416 | 3.01 | 3.38 | 1,253 |
| Aug. 6 | do | 224 | 393 | 2.93 | 3.26 | 1,150 |
| Aug. 9 | W. A. Lamb and J. C. Hoyt (U.S.G.S.) | 225 | 357 | 2.81 | 3.20 | 1,004 |
| Aug. 17 | V. A. Newhall | 202 | 348 | 2.68 | 3.05 | 934 |
| Oct. 7 | do | 196 | 336 | 2.71 | 2.85 | 909 |
| Nov. 10 | W. H. Storey | 179 | 286 | 2.01 | 3.51*f* | 576 |
| Nov. 12 | do | 170 | 255 | 2.08 | 3.24*f* | 530 |
| Dec. 5 | do | 104 | 108 | 3.10 | 3.37*g* | 336 |
| Dec. 8 | do | 104 | 105 | 3.02 | 3.32 | 317 |
| Dec. 22 | do | 59 | 70 | 2.63 | 2.93 | 185 |
| Dec. 24 | do | 57 | 65 | 2.16 | 2.84 | 141 |
| Dec. 27 | do | 57 | 64 | 2.29 | 2.85*g* | 147 |

*a* to *a* Winter gauge at bridge.
*b* to *b* Summer gauge at automatic gauge.
*f* to *f* Staff gauge at cable.
*g* to *g* Winter gauge at bridge.

DAILY GAUGE HEIGHT AND DISCHARGE of St. Mary River near Kimball, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 5.06*a* | 181 | 5.50 | 148 | 4.65 | 114 | 1.79 | 212 | 3.57 | 1,420 | 3.61 | 1,461 |
| 2 | 5.16*d* | 180 | 5.42*d* | 146 | 4.50 | 112 | 1.87 | 240 | 3.77 | 1,637 | 3.63 | 1,483 |
| 3 | 5.25 | 182 | 5.35 | 143 | 4.70 | 108 | 1.94 | 266 | 3.85 | 1,730 | 4.32 | 2,306 |
| 4 | 5.25 | 184 | 5.50 | 140 | 4.80 | 108 | 1.99 | 286 | 3.81 | 1,682 | 4.39 | 2,397 |
| 5 | 4.70 | 185 | 5.40 | 137 | 4.75 | 109 | 2.04 | 306 | 3.76 | 1,626 | 4.45*d* | 2,475 |
| 6 | 4.35 | 186 | 5.40 | 133 | 4.68 | 110 | 2.09 | 326 | 3.66 | 1,516 | 4.45*d* | 2,475 |
| 7 | 4.15 | 186 | 5.30 | 130 | 4.71*d* | 111 | 2.11 | 334 | 3.58 | 1,430 | 4.35 | 2,345 |
| 8 | 4.70 | 185 | 5.29 | 126 | 4.74 | 113 | 2.14 | 348 | 3.69 | 1,549 | 4.36 | 2,358 |
| 9 | 4.65 | 183 | 5.25 | 121 | 4.62*d* | 117 | 2.08 | 322 | 3.98 | 1,886 | 4.30 | 2,280 |
| 10 | 4.48*d* | 180 | 5.20 | 115 | 4.50 | 121 | 2.11 | 334 | 4.12 | 2,054 | 4.46 | 2,488 |
| 11 | 4.30 | 177 | 5.20 | 110 | 4.60 | 125 | 2.07*d* | 318 | 4.18 | 2,126 | 4.24 | 2,202 |
| 12 | 4.25 | 173 | 5.25 | 110 | 4.65 | 129 | 2.08 | 322 | 4.12 | 2,054 | 4.14*d* | 2,078 |
| 13 | 4.15 | 169 | 5.20 | 110 | 4.74 | 131 | 2.12 | 339 | 4.16 | 2,102 | 4.08 | 2,006 |
| 14 | 4.70 | 165 | 5.20 | 111 | 4.92*d* | 133 | 2.23 | 388 | 4.25 | 2,215 | 4.15 | 2,090 |
| 15 | 5.55 | 160 | 5.15 | 111 | 5.10 | 137 | 2.35 | 448 | 4.20 | 2,150 | 4.21 | 2,163 |
| 16 | 5.20 | 157 | 5.15 | 111 | 5.15 | 150 | 2.44 | 497 | 4.06*d* | 1,982 | 4.28 | 2,254 |
| 17 | 5.35*d* | 153 | 5.30 | 111 | 5.22*d* | 175 | 2.52 | 543 | 3.93 | 1,826 | 4.26 | 2,228 |
| 18 | 5.50 | 151 | 5.15 | 111 | 5.30 | 218 | 2.68 | 647 | 3.90 | 1,790 | 4.45 | 2,475 |
| 19 | 5.50 | 150 | 5.15 | 107 | 5.33 | 253 | 2.84 | 765 | 3.78 | 1,648 | 4.39*d* | 2,397 |
| 20 | 5.43 | 155 | 5.00 | 102 | 4.86 | 262 | 3.00 | 890 | 3.65 | 1,505 | 4.30 | 2,280 |
| 21 | 5.15 | 164 | 4.15 | 96 | 4.95 | 265 | 3.02 | 907 | 3.55 | 1,400 | 4.21 | 2,163 |
| 22 | 5.25 | 166 | 4.65 | 93 | 4.70 | 260 | 3.06 | 941 | 3.49 | 1,340 | 4.16 | 2,102 |
| 23 | 5.35 | 166 | 4.90 | 95 | 4.65 | 220 | 3.05 | 932 | 3.42 | 1,270 | 4.10 | 2,030 |
| 24 | 5.32*d* | 166 | 4.78 | 104 | 4.50 | 180 | 3.03 | 916 | 3.43 | 1,280 | 4.11 | 2,042 |
| 25 | 5.28*d* | 165 | 4.80 | 114 | 4.60 | 142 | 3.00 | 890 | 3.50 | 1,350 | 4.46 | 2,488 |
| 26 | 5.25 | 164 | 4.85 | 116 | 4.65 | 140 | 3.00 | 890 | 3.51 | 1,360 | 4.60*d* | 2,670 |
| 27 | 5.25 | 160 | 4.88 | 116 | 4.70 | 150 | 2.98 | 874 | 3.53 | 1,380 | 4.55*d* | 2,605 |
| 28 | 5.40 | 158 | 4.65 | 117 | 4.66*ad* | 160 | 2.97 | 866 | 3.52 | 1,370 | 4.46 | 2,488 |
| 29 | 5.38*d* | 154 | ..... | ..... | 1.62*b* | 165 | 3.00 | 890 | 3.54 | 1,390 | 4.38 | 2,384 |
| 30 | 5.35 | 151 | ..... | ..... | 1.61 | 162 | 3.15 | 1,018 | 3.60 | 1,450 | 4.32 | 2,306 |
| 31 | 5.42*d* | 149 | ..... | ..... | 1.72 | 191 | ..... | ..... | 3.60 | 1,450 | ..... | ..... |

*a* to *a* Ice conditions and chain gauge records at bridge.
*b* to *b* Open water conditions and records from automatic gauge.
*c* to *c* Ice conditions and chain gauge records at bridge.
*d* Estimated gauge heights.

DAILY GAUGE HEIGHT AND DISCHARGE of St. Mary River near Kimball, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 4.48 | 2,514 | 3.51 | 1,360 | 2.69 | 654 | 2.39 | 470 | 2.38 | 464 | 3.63 | 347 |
| 2 | 4.42 | 2,436 | 3.45 | 1,300 | 2.86 | 780 | 2.45 | 502 | 2.35 | 448 | 3.36 | 341 |
| 3 | 4.48 | 2,514 | 3.39 | 1,240 | 3.82 | 1,694 | 2.60 | 595 | 2.35 | 448 | 3.43 | 339 |
| 4 | 4.36 | 2,358 | 3.34 | 1,193 | 3.64*d* | 1,494 | 2.70 | 660 | 2.35 | 448 | 3.46 | 338 |
| 5 | 4.23 | 2,189 | 3.30 | 1,155 | 3.40 | 1,250 | 2.82 | 750 | 2.38 | 464 | 3.37 | 336 |
| 6 | 4.14 | 2,078 | 3.26 | 1,117 | 3.20 | 1,060 | 2.90 | 810 | 2.33*d* | 436 | 3.33 | 332 |
| 7 | 4.13 | 2,066 | 3.21 | 1,070 | 3.09 | 966 | 2.86 | 780 | 2.30*d* | 420 | 3.35 | 327 |
| 8 | 4.10 | 2,030 | 3.20 | 1,060 | 2.98 | 874 | 2.85 | 772 | 2.28 | 411 | 3.32 | 316 |
| 9 | 4.06 | 1,982 | 3.20 | 1,060 | 2.99 | 882 | 2.78 | 720 | 2.25 | 398 | 3.30 | 310 |
| 10 | 4.02 | 1,934 | 3.18 | 1,043 | 3.04 | 924 | 2.73 | 682 | 2.24 | 393 | 3.15 | 302 |
| 11 | 3.84 | 1,718 | 3.15 | 1,018 | 2.96*d* | 858 | 2.71 | 668 | 2.20 | 375 | 3.20 | 295 |
| 12 | 3.75 | 1,615 | 3.13 | 1,000 | 2.89*d* | 802 | 2.70 | 660 | 2.20 | 375 | 3.30 | 287 |
| 13 | 3.66 | 1,516 | 3.14 | 1,009 | 2.86 | 780 | 2.61 | 602 | 2.18 | 366 | 3.15 | 278 |
| 14 | 3.64 | 1,494 | 3.18 | 1,043 | 2.83 | 758 | 2.58 | 582 | 2.28*db* | 411 | 3.28 | 269 |
| 15 | 3.58 | 1,430 | 3.08*d* | 958 | 2.77 | 712 | 2.60 | 595 | 3.56*c* | 411 | 3.22 | 259 |
| 16 | 3.50 | 1,350 | 3.07 | 950 | 2.69 | 654 | 2.60 | 595 | 3.63 | 406 | 3.15 | 250 |
| 17 | 3.68 | 1,538 | 3.05 | 932 | 2.70 | 660 | 2.58 | 582 | 3.73 | 404 | 3.12 | 239 |
| 18 | 4.12*d* | 2,054 | 3.02 | 907 | 2.83 | 758 | 2.54 | 556 | 3.73 | 402 | 3.15 | 229 |
| 19 | 4.00*d* | 1,910 | 3.01 | 898 | 3.00 | 890 | 2.52 | 543 | 3.88 | 400 | 3.05*d* | 218 |
| 20 | 3.63 | 1,483 | 3.15 | 1,018 | 2.99 | 882 | 2.48 | 519 | 3.23 | 399 | 2.95 | 205 |
| 21 | 3.46 | 1,310 | 3.12 | 992 | 2.92 | 826 | 2.45 | 502 | 3.53 | 398 | 3.00 | 194 |
| 22 | 3.42 | 1,270 | 3.02*d* | 907 | 2.81 | 742 | 2.44 | 497 | 3.63 | 397 | 2.93 | 185 |
| 23 | 3.40 | 1,250 | 2.97 | 866 | 2.82 | 750 | 2.43 | 492 | 3.53 | 396 | 2.95 | 151 |
| 24 | 3.39 | 1,240 | 2.91 | 818 | 2.80 | 735 | 2.41 | 480 | 3.50 | 396 | 2.84 | 142 |
| 25 | 3.39 | 1,240 | 2.88 | 795 | 2.78 | 720 | 2.34 | 442 | 3.43*d* | 395 | 2.85*d* | 140 |
| 26 | 3.51 | 1,360 | 2.83 | 758 | 2.71 | 668 | 2.34 | 442 | 3.36 | 394 | 2.86 | 142 |
| 27 | 3.53 | 1,380 | 2.81 | 742 | 2.69 | 654 | 2.38 | 464 | 3.44 | 390 | 2.85 | 147 |
| 28 | 3.76 | 1,626 | 2.81 | 742 | 2.66 | 634 | 2.41 | 480 | 3.54*d* | 383 | 2.80*d* | 150 |
| 29 | 3.69 | 1,549 | 2.79 | 728 | 2.65 | 628 | 2.45 | 502 | 3.63 | 372 | 2.75 | 155 |
| 30 | 3.69 | 1,549 | 2.74 | 690 | 2.58 | 582 | 2.46 | 508 | 3.48 | 354 | 3.25 | 154 |
| 31 | 3.56 | 1,410 | 2.73 | 682 | ..... | ..... | 2.45 | 502 | ..... | ..... | 4.10*c* | 153 |

*a* to *a* Ice conditions, and chain gauge records at bridge.
*b* to *b* Open water conditions with records from automatic gauge.
*c* to *c* Ice conditions, and chain gauge records at bridge.
*d* Estimated gauge heights.

MONTHLY DISCHARGE of St. Mary River near Kimball, for 1915.

(Drainage area 472 square miles)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 186 | 149 | 168 | 0.356 | 0.41 | 10,330 |
| February | 148 | 93 | 117 | 0.248 | 0.26 | 6,498 |
| March | 265 | 108 | 157 | 0.333 | 0.38 | 9,654 |
| April | 1,018 | 212 | 575 | 1.220 | 1.36 | 34,215 |
| May | 2,215 | 1,270 | 1,645 | 3.490 | 4.02 | 101,145 |
| June | 2,670 | 1,461 | 2,251 | 4.770 | 5.32 | 133,940 |
| July | 2,514 | 1,240 | 1,722 | 3.648 | 4.21 | 105,882 |
| August | 1,360 | 1,360 | 969 | 2.053 | 2.37 | 59,581 |
| September | 1,694 | 1,694 | 842 | 1.784 | 1.99 | 50,102 |
| October | 810 | 810 | 579 | 1.227 | 1.42 | 35,601 |
| November | 464 | 464 | 405 | 0.858 | 0.96 | 24,099 |
| December | 347 | 347 | 243 | 0.515 | 0.59 | 14,941 |
| The year | ..... | ..... | ..... | ..... | 23.29 | 585,988 |

ALBERTA RAILWAY AND IRRIGATION COMPANY'S CANAL AT KIMBALL.

*Location.*—On the SE. ¼ Sec. 36, Tp. 1, Rge. 25, W. 4th Mer., at a concrete measuring section 500 feet below the control gates at the intake of the Alberta Railway and Irrigation Company's canal.

*Records available.*—From April 27, 1915, to October 9, 1915.

*Gauge.*—Inclined staff, set in concrete slopes of 1½ to 1. Graduations on staff developed for slopes of 1½ to 1.

*Channel.*—Above and below section, stream bed is composed of loose gravel and boulders. At section bed is composed of mixed gravel, levelled and tamped. Stream bed not liable to shift as velocities are not excessive.

*Discharge measurements.*—Made from foot bridge having a trussed-span of 44 feet, with one hand-rail.

*Artificial control.*—The discharge is controlled by headgates 500 feet above the measuring section.

*Observer.*—W. D. Willgrass.

*Remarks.*—This station serves to register the amount of water diverted from the St. Mary River at Kimball for the Alberta Railway and Irrigation Company's purposes. In wet seasons there is more water registered at the Alberta Railway and Irrigation Company's flume, six miles below the headgates, owing to ground water flowing into the canal, but in dry seasons the diversion from the St. Mary River is the sole source of supply.

DISCHARGE MEASUREMENTS of the Alberta Railway and Irrigation Company's Canal at Kimball, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 6 | V. A. Newhall | 34.0 | 97.92 | 2.77 | 3.410 | 272 |
| May 11 | do | 34.0 | 98.40 | 2.81 | 3.440 | 276 |
| May 21 | do | 34.9 | 112.00 | 3.03 | 3.800 | 339 |
| May 22 | do | 35.5 | 119.30 | 3.12 | 4.005 | 372 |
| June 12 | do | 34.8 | 109.70 | 3.03 | 3.745 | 333 |
| July 12 | do | 32.7 | 86.30 | 2.63 | 3.005 | 227 |
| Aug. 3 | do | 32.1 | 80.91 | 2.57 | 2.800 | 208 |
| Aug. 6 | do | 32.2 | 79.16 | 2.45 | 2.800 | 194 |
| Aug. 17 | do | 32.2 | 78.68 | 2.50 | 2.800 | 196 |

DAILY GAUGE HEIGHT AND DISCHARGE of Alberta Railway and Irrigation Company's Canal at Kimball, for 1915.

| Day. | April. | | May. | | June. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 3.02 | 224 | 3.99 | 368 |
| 2 | ..... | ..... | 2.99 | 221 | 4.00 | 370 |
| 3 | ..... | ..... | 3.19 | 247 | 3.94 | 360 |
| 4 | ..... | ..... | 3.20 | 248 | 3.91 | 356 |
| 5 | ..... | ..... | 3.38 | 273 | 3.89 | 352 |
| 6 | ..... | ..... | 3.39 | 275 | 3.90 | 354 |
| 7 | ..... | ..... | 3.40 | 276 | 3.90 | 354 |
| 8 | ..... | ..... | 3.40 | 276 | 3.91 | 356 |
| 9 | ..... | ..... | 3.40 | 276 | 3.92 | 357 |
| 10 | ..... | ..... | 3.39 | 275 | 3.82 | 341 |
| 11 | ..... | ..... | 3.45 | 283 | 3.76 | 332 |
| 12 | ..... | ..... | 3.39 | 275 | 3.74 | 328 |
| 13 | ..... | ..... | 3.79 | 336 | 3.72 | 325 |
| 14 | ..... | ..... | 3.79 | 336 | 3.76 | 332 |
| 15 | ..... | ..... | 3.80 | 338 | 3.76 | 332 |
| 16 | ..... | ..... | 3.78 | 335 | 3.76 | 332 |
| 17 | ..... | ..... | 3.79 | 336 | 3.74 | 328 |
| 18 | ..... | ..... | 3.79 | 336 | 3.74 | 328 |
| 19 | ..... | ..... | 3.76 | 332 | 3.70 | 322 |
| 20 | ..... | ..... | 3.78 | 335 | 3.65 | 314 |
| 21 | ..... | ..... | 3.79 | 336 | 3.64 | 312 |
| 22 | ..... | ..... | 3.98 | 367 | 3.64 | 312 |
| 23 | ..... | ..... | 3.99 | 368 | 3.65 | 314 |
| 24 | ..... | ..... | 4.00 | 370 | 3.55 | 298 |
| 25 | ..... | ..... | 3.98 | 367 | 1.90 | 118 |
| 26 | ..... | ..... | 3.98 | 367 | 3.00 | 222 |
| 27 | 1.00 | 58 | 4.00 | 370 | 3.01 | 223 |
| 28 | 2.60 | 177 | 3.98 | 367 | 2.99 | 221 |
| 29 | 2.50 | 167 | 4.00 | 370 | 3.00 | 222 |
| 30 | 2.50 | 167 | 3.98 | 367 | 2.98 | 220 |
| 31 | ..... | ..... | 4.00 | 370 | ..... | ..... |

Gates opened on April 27.
Gates closed on October 9

DAILY GAUGE HEIGHT AND DISCHARGE of the Alberta Railway and Irrigation Company's Canal at Kimball, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.01 | 223 | 2.89 | 209 | 2.79 | 198 | 3.22 | 251 |
| 2 | 2.99 | 221 | 2.78 | 197 | 2.80 | 199 | 3.26 | 256 |
| 3 | 3.20 | 248 | 2.80 | 199 | 2.82 | 201 | 3.25 | 255 |
| 4 | 3.19 | 247 | 2.80 | 199 | 2.80 | 199 | 3.26 | 256 |
| 5 | 3.10 | 234 | 2.79 | 198 | 2.79 | 198 | 3.02 | 224 |
| 6 | 3.00 | 222 | 2.80 | 199 | 2.80 | 199 | 2.80 | 199 |
| 7 | 3.00 | 222 | 2.80 | 199 | 2.80 | 199 | 2.80 | 199 |
| 8 | 2.99 | 221 | 2.80 | 199 | 3.18 | 245 | 2.80 | 199 |
| 9 | 3.00 | 222 | 2.80 | 199 | 3.40 | 276 | ..... | ..... |
| 10 | 2.99 | 221 | 2.80 | 199 | 3.39 | 275 | ..... | ..... |
| 11 | 3.00 | 222 | 2.80 | 199 | 3.38 | 273 | ..... | ..... |
| 12 | 2.99 | 221 | 2.79 | 198 | 3.38 | 273 | ..... | ..... |
| 13 | 3.00 | 222 | 2.80 | 199 | 3.38 | 273 | ..... | ..... |
| 14 | 3.00 | 222 | 2.80 | 199 | 3.25 | 255 | ..... | ..... |
| 15 | 2.99 | 221 | 2.80 | 199 | 3.25 | 255 | ..... | ..... |
| 16 | 2.99 | 221 | 2.80 | 199 | 3.25 | 255 | ..... | ..... |
| 17 | 3.02 | 224 | 2.80 | 199 | 3.24 | 254 | ..... | ..... |
| 18 | 2.99 | 221 | 2.79 | 198 | 3.24 | 254 | ..... | ..... |
| 19 | 3.00 | 222 | 2.81 | 200 | 3.25 | 255 | ..... | ..... |
| 20 | 2.98 | 220 | 2.80 | 199 | 3.25 | 255 | ..... | ..... |
| 21 | 2.99 | 221 | 2.79 | 198 | 3.24 | 254 | ..... | ..... |
| 22 | 3.00 | 222 | 2.80 | 199 | 3.22 | 251 | ..... | ..... |
| 23 | 3.00 | 222 | 2.80 | 199 | 3.24 | 254 | ..... | ..... |
| 24 | 3.00 | 222 | 2.80 | 199 | 3.26 | 256 | ..... | ..... |
| 25 | 3.00 | 222 | 2.80 | 199 | 3.24 | 254 | ..... | ..... |
| 26 | 3.00 | 222 | 2.80 | 199 | 3.22 | 251 | ..... | ..... |
| 27 | 3.00 | 222 | 2.80 | 199 | 3.24 | 254 | ..... | ..... |
| 28 | 2.98 | 220 | 2.80 | 199 | 3.24 | 254 | ..... | ..... |
| 29 | 2.90 | 210 | 2.80 | 199 | 3.25 | 255 | ..... | ..... |
| 30 | 2.80 | 199 | 2.80 | 199 | 3.24 | 254 | ..... | ..... |
| 31 | 2.90 | 210 | 2.80 | 199 | ..... | ..... | ..... | ..... |

Gates opened on April 27.
Gates closed on October 9.

MONTHLY DISCHARGE of Alberta Railway and Irrigation Company's Canal at Kimball, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| April (27-30) | 177 | 58 | 142 | 1,126 |
| May | 370 | 221 | 318 | 19,553 |
| June | 370 | 118 | 310 | 18,446 |
| July | 248 | 199 | 222 | 13,650 |
| August | 209 | 197 | 199 | 12,236 |
| September | 276 | 198 | 244 | 14,519 |
| October (1-9) | 256 | 199 | 230 | 3,649 |
| The period | ..... | ..... | ..... | 83,179 |

Gates opened and water admitted April 27.
Gates closed and water shut out October 9.

ALBERTA RAILWAY AND IRRIGATION COMPANY'S CANAL NEAR KIMBALL.

*Location.*—On the SE. ¼ Sec. 21, Tp. 2, Rge. 24, W. 4th Mer., at the flume over Rolph Creek.
*Records available.*—July 26, 1910, to October 8, 1915.
*Gauge.*—Vertical staff. Zero level with bottom of flume at gauge.
*Channel.*—Smooth plank flume 768 feet long.

*Discharge measurements.*—Made from a foot bridge, spanning the flume at a point about midway from the ends.

*Artificial control.*—The discharge is controlled by headgates at Kimball about six miles above the flume.

*Observer.*—J. M. Dunn, Kimball, for Alberta Railway and Irrigation Company.

*Remarks.*—A new flume was built just to the right, to replace the old structure, during October, November and December, 1914, and used during 1915. It is 27 feet wide and 8 feet deep. A vertical metal staff is countersunk in the left side of this flume about midway from the ends.

DISCHARGE MEASUREMENTS of Alberta Railway and Irrigation Company's Canal near Kimball, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 6 | V. A. Newhall | 27.0 | 75.6 | 3.63 | 2.820 | 274 |
| May 11 | do | 27.0 | 77.0 | 3.64 | 2.830 | 280 |
| June 12 | do | 27.0 | 85.0 | 3.95 | 3.135 | 336 |
| June 18 | do | 27.0 | 83.7 | 3.93 | 3.110 | 329 |
| July 13 | do | 27.0 | 68.8 | 3.21 | 2.540 | 221 |
| July 15 | do | 27.0 | 68.8 | 3.24 | 2.540 | 223 |
| Aug. 4 | do | 27.0 | 66.3 | 2.99 | 2.400 | 198 |
| Aug. 19 | G. H. Whyte and V. A. Newhall | 27.0 | 66.2 | 2.96 | 2.405 | 196 |
| Sept. 1 | V. A. Newhall | 27.0 | 65.4 | 2.98 | 2.405 | 194 |
| Oct. 2 | do | 27.0 | 74.2 | 3.41 | 2.740 | 253 |

DAILY GAUGE HEIGHT AND DISCHARGE of Alberta Railway and Irrigation Company's Canal, near Kimball, for 1915.

| Day. | April. | | May. | | June. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | | | 2.55 | 222 | 3.31 | 372 |
| 2 | | | 2.55 | 222 | 3.31 | 372 |
| 3 | | | 2.68 | 246 | 3.30 | 370 |
| 4 | | | 2.82 | 274 | 3.25 | 360 |
| 5 | | | 2.83 | 276 | 3.20 | 350 |
| 6 | | | 2.82 | 274 | 3.20 | 350 |
| 7 | | | 2.82 | 274 | 3.20 | 350 |
| 8 | | | 2.82 | 274 | 3.20 | 350 |
| 9 | | | 2.81 | 272 | 3.20 | 350 |
| 10 | | | 2.82 | 274 | 3.20 | 350 |
| 11 | | | 2.83 | 276 | 3.12 | 334 |
| 12 | | | 3.16 | 342 | 3.13 | 336 |
| 13 | | | 3.15 | 340 | 3.12 | 334 |
| 14 | | | 3.15 | 340 | 3.13 | 336 |
| 15 | | | 3.15 | 340 | 3.13 | 336 |
| 16 | | | 3.13 | 336 | 3.13 | 336 |
| 17 | | | 3.14 | 338 | 3.12 | 334 |
| 18 | | | 3.15 | 340 | 3.14 | 338 |
| 19 | | | 3.15 | 340 | 3.08 | 326 |
| 20 | | | 3.15 | 340 | 3.04 | 318 |
| 21 | | | 3.15 | 340 | 3.05 | 320 |
| 22 | | | 3.32 | 374 | 3.04 | 318 |
| 23 | | | 3.31 | 372 | 3.04 | 318 |
| 24 | | | 3.31 | 372 | 3.04 | 318 |
| 25 | | | 3.31 | 372 | 2.86 | 282 |
| 26 | | | 3.31 | 372 | 1.35 | 48 |
| 27 | 2.20 | 160 | 3.30 | 370 | 2.55 | 222 |
| 28 | 2.15 | 152 | 3.31 | 372 | 2.52 | 217 |
| 29 | 2.15 | 152 | 3.31 | 372 | 2.53 | 218 |
| 30 | 2.15 | 152 | 3.31 | 372 | 2.45 | 204 |
| 31 | | | 3.31 | 372 | | |

Gates opened April 27.
Gates closed October 9.

DAILY GAUGE HEIGHT AND DISCHARGE of Alberta Railway and Irrigation Company's Canal, near Kimball, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.57 | 226 | 2.40 | 195 | 2.40 | 195 | 2.70 | 250 |
| 2 | 2.55 | 222 | 2.38 | 191 | 2.40 | 195 | 2.73 | 256 |
| 3 | 2.70 | 250 | 2.38 | 191 | 2.40 | 195 | 2.72*d* | 254 |
| 4 | 2.68 | 246 | 2.40 | 195 | 2.39 | 193 | 2.72 | 254 |
| 5 | 2.68 | 246 | 2.40 | 195 | 2.40*d* | 195 | 2.71 | 252 |
| 6 | 2.54 | 220 | 2.40 | 195 | 2.40 | 195 | 2.40 | 195 |
| 7 | 2.54 | 220 | 2.40 | 195 | 2.60 | 231 | 2.40 | 195 |
| 8 | 2.54 | 220 | 2.40 | 195 | 2.83 | 276 | 2.40 | 195 |
| 9 | 2.54 | 220 | 2.40 | 195 | 2.83 | 276 | ..... | ..... |
| 10 | 2.54 | 220 | 2.40 | 195 | 2.83 | 276 | ..... | ..... |
| 11 | 2.54 | 220 | 2.40 | 195 | 2.82 | 274 | ..... | ..... |
| 12 | 2.54 | 220 | 2.40 | 195 | 2.82 | 271 | ..... | ..... |
| 13 | 2.54 | 220 | 2.40 | 195 | 2.82 | 274 | ..... | ..... |
| 14 | 2.54 | 220 | 2.40 | 195 | 2.72 | 254 | ..... | ..... |
| 15 | 2.54 | 220 | 2.40 | 195 | 2.70 | 250 | ..... | ..... |
| 16 | 2.54 | 220 | 2.40 | 195 | 2.70 | 250 | ..... | ..... |
| 17 | 2.54 | 220 | 2.40 | 195 | 2.70 | 250 | ..... | ..... |
| 18 | 2.54 | 220 | 2.40 | 195 | 2.70 | 250 | ..... | ..... |
| 19 | 2.54 | 220 | 2.40 | 195 | 2.70*d* | 250 | ..... | ..... |
| 20 | 2.54 | 220 | 2.40 | 195 | 2.70 | 250 | ..... | ..... |
| 21 | 2.55 | 222 | 2.40 | 195 | 2.70 | 250 | ..... | ..... |
| 22 | 2.54 | 220 | 2.40 | 195 | 2.70 | 250 | ..... | ..... |
| 23 | 2.54 | 220 | 2.40 | 195 | 2.70 | 250 | ..... | ..... |
| 24 | 2.54 | 220 | 2.40 | 195 | 2.70 | 520 | ..... | ..... |
| 25 | 2.55 | 222 | 2.40 | 195 | 2.70 | 250 | ..... | ..... |
| 26 | 2.54 | 220 | 2.40 | 195 | 2.70 | 250 | ..... | ..... |
| 27 | 2.54 | 220 | 2.40 | 195 | 2.70 | 250 | ..... | ..... |
| 28 | 2.52 | 217 | 2.40 | 195 | 2.70 | 250 | ..... | ..... |
| 29 | 2.54 | 220 | 2.40 | 195 | 2.70 | 250 | ..... | ..... |
| 30 | 2.45 | 204 | 2.40 | 195 | 2.70 | 250 | ..... | ..... |
| 31 | 2.42 | 199 | 2.40 | 195 | ..... | ..... | ..... | ..... |

Gates opened April 27.
Gates closed October 9.

MONTHLY DISCHARGE of Alberta Railway and Irrigation Company's Canal, near Kimball, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| April (27-30) | 160 | 152 | 154 | 1,222 |
| May | 374 | 222 | 323 | 19,860 |
| June | 372 | 48 | 312 | 18,565 |
| July | 250 | 199 | 222 | 13,650 |
| August | 195 | 191 | 195 | 11,990 |
| September | 276 | 193 | 243 | 14,460 |
| October (1-9) | 256 | 195 | 231 | 3,665 |
| The period | ..... | ..... | ..... | 83,412 |

Gates opened and water admitted April 27.
Gates closed and water shut out October 9.

ROLPH CREEK NEAR KIMBALL.

*Location.*—On the SE. ¼ Sec. 21, Tp. 2, Rge. 24, W. 4th Mer.
*Records available.*—May 17, 1911, to October 31, 1915.
*Gauge.*—Vertical staff. Zero of gauge maintained at 93.41 feet during 1913–15.
*Bench-mark.*—Permanent iron bench-mark located on the left bank 100 feet downstream. Assumed elevation, 100.00 feet.
*Channel.*—Consists of sand, gravel and stone; likely to shift.
*Discharge measurements.*—Made by wading.
*Observer.*—J. M. Dunn, Kimball P.O., Alta.

DISCHARGE MEASUREMENTS of Rolph Creek, near Kimball, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 26 | J. E. Degnan | 19.2 | 17.80 | 1.53 | 1.29 | 27.00 |
| April 20 | V. A. Newhall | 8.0 | 4.62 | 0.86 | 0.62 | 3.97 |
| May 11 | do | 8.5 | 4.47 | 0.87 | 0.62 | 3.91 |
| June 12 | do | 27.1 | 26.00 | 2.72 | 1.68 | 71.00 |
| June 18 | do | 26.2 | 23.28 | 2.29 | 1.54 | 53.00 |
| July 13 | do | 20.5 | 18.27 | 1.15 | 1.15 | 21.00 |
| July 15 | do | 20.2 | 16.33 | 1.05 | 1.04 | 17.20 |
| Aug. 4 | do | 21.8 | 20.14 | 1.75 | 1.33 | 35.00 |
| Aug. 19 | do | 12.2 | 6.18 | 0.96 | 0.76 | 5.90 |
| Sept. 1 | do | 13.0 | 7.53 | 1.49 | 0.94 | 11.20 |
| Oct. 2 | do | 14.0 | 9.55 | 1.62 | 1.02 | 15.40 |

DAILY GAUGE HEIGHT AND DISCHARGE of Rolph Creek near Kimball, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.11 | 19.0 | 0.65 | 4.4 | 0.48 | 2.2 |
| 2 | ..... | ..... | 1.18 | 22.0 | 0.66*d* | 4.6 | 0.47 | 2.1 |
| 3 | ..... | ..... | 1.20 | 24.0 | 0.67 | 4.7 | 0.55 | 3.0 |
| 4 | ..... | ..... | 1.15 | 21.0 | 0.70 | 5.2 | 2.10 | 125.0 |
| 5 | ..... | ..... | 1.10 | 18.5 | 0.77 | 6.7 | 2.10 | 125.0 |
| 6 | ..... | ..... | 1.10 | 18.5 | 0.76 | 6.5 | 2.05 | 118.0 |
| 7 | ..... | ..... | 1.05 | 16.0 | 0.75 | 6.3 | 2.00 | 112.0 |
| 8 | ..... | ..... | 1.05 | 16.0 | 0.73 | 5.9 | 1.87 | 95.0 |
| 9 | ..... | ..... | 1.00 | 14.0 | 0.68 | 4.9 | 1.65 | 66.0 |
| 10 | ..... | ..... | 1.00 | 14.0 | 0.65 | 4.4 | 1.62 | 63.0 |
| 11 | ..... | ..... | 0.97 | 12.8 | 0.62 | 3.9 | 1.65 | 66.0 |
| 12 | ..... | ..... | 0.95 | 12.0 | 0.62 | 3.9 | 1.68 | 70.0 |
| 13 | ..... | ..... | 0.90 | 10.2 | 0.63 | 4.1 | 1.68 | 70.0 |
| 14 | ..... | ..... | 0.84 | 8.5 | 0.80 | 7.4 | 1.65 | 66.0 |
| 15 | ..... | ..... | 0.78 | 7.0 | 1.50 | 49.0 | 1.63 | 64.0 |
| 16 | ..... | ..... | 0.75 | 6.3 | 1.40 | 39.0 | 1.60 | 60.0 |
| 17 | ..... | ..... | 0.72 | 5.6 | 1.35 | 34.0 | 1.57 | 57.0 |
| 18 | ..... | ..... | 0.70*d* | 5.2 | 1.30 | 31.0 | 1.54 | 53.0 |
| 19 | ..... | ..... | 0.68 | 4.9 | 1.20 | 24.0 | 1.70 | 73.0 |
| 20 | ..... | ..... | 0.62 | 3.9 | 1.10 | 18.0 | 1.65*d* | 66.0 |
| 21 | ..... | ..... | 0.60 | 3.6 | 1.05 | 16.0 | 1.60 | 60.0 |
| 22 | 1.75 | 80.0 | 0.60 | 3.6 | 1.00 | 14.0 | 1.50 | 49.0 |
| 23 | 1.70 | 73.0 | 0.58 | 3.4 | 0.98 | 13.2 | 1.40 | 39.0 |
| 24 | 1.50 | 49.0 | 0.56 | 3.1 | 0.95 | 12.0 | 1.35 | 34.0 |
| 25 | 1.40 | 39.0 | 0.56*d* | 3.1 | 0.93 | 11.3 | 1.40 | 39.0 |
| 26 | 1.29 | 29.0 | 0.55 | 3.0 | 0.88 | 9.4 | 2.75 | 210.0 |
| 27 | 1.25 | 27.0 | 0.60 | 3.6 | 0.80 | 7.4 | 2.60 | 190.0 |
| 28 | 1.25*d* | 27.0 | 0.56 | 3.1 | 0.70 | 5.2 | 2.50 | 177.0 |
| 29 | 1.25 | 27.0 | 0.50 | 2.4 | 0.60 | 3.6 | 2.38 | 161.0 |
| 30 | 1.15 | 21.0 | 0.50 | 2.4 | 0.48 | 2.2 | 2.25 | 144.0 |
| 31 | 1.12 | 19.5 | | | 0.47 | 2.1 | | |

*d* Estimated gauge height.

DAILY GAUGE HEIGHT AND DISCHARGE of Rolph Creek near Kimball, for 1915.—*Concluded.*

| Month. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.10 | 125.0 | 1.54*d* | 53.0 | 0.94 | 11.6 | 1.00 | 14.0 |
| 2 | 1.90 | 99.0 | 1.50 | 49.0 | 1.13*d* | 20.0 | 1.02 | 14.8 |
| 3 | 1.70 | 73.0 | 1.45 | 44.0 | 1.31*d* | 32.0 | 1.04*d* | 15.6 |
| 4 | 1.58 | 58.0 | 1.33 | 33.0 | 1.50 | 49.0 | 1.05 | 16.0 |
| 5 | 1.50 | 49.0 | 1.28 | 29.0 | 1.50 | 49.0 | 1.05 | 16.0 |
| 6 | 1.45 | 44.0 | 1.25 | 27.0 | 1.55 | 54.0 | 1.08 | 17.2 |
| 7 | 1.45 | 44.0 | 1.20 | 24.0 | 1.50 | 49.0 | 1.20 | 24.0 |
| 8 | 1.45 | 44.0 | 1.15*d* | 21.0 | 1.38 | 37.0 | 1.23 | 26.0 |
| 9 | 1.45 | 44.0 | 1.10 | 18.5 | 1.28 | 29.0 | 1.20 | 24.0 |
| 10 | 1.45 | 44.0 | 1.00 | 14.0 | 1.20 | 24.0 | 1.19*d* | 23.0 |
| 11 | 1.38 | 37.0 | 0.95 | 12.0 | 1.15 | 21.0 | 1.18 | 22.0 |
| 12 | 1.27 | 28.0 | 0.90 | 10.2 | 1.15*d* | 21.0 | 1.17*d* | 22.0 |
| 13 | 1.15 | 21.0 | 0.87 | 9.5 | 1.15 | 21.0 | 1.16 | 22.0 |
| 14 | 1.15 | 21.0 | 0.80 | 7.4 | 1.15 | 21.0 | 1.16*d* | 22.0 |
| 15 | 1.04 | 15.6 | 0.78*d* | 7.0 | 1.12 | 19.5 | 1.15 | 21.0 |
| 16 | 1.17 | 22.0 | 0.77 | 6.7 | 1.10 | 18.5 | 1.08*d* | 17.2 |
| 17 | 1.17 | 22.0 | 0.77*d* | 6.7 | 1.10 | 18.5 | 1.00 | 14.0 |
| 18 | 1.25 | 27.0 | 0.76*d* | 6.5 | 1.10 | 18.5 | 1.00 | 14.0 |
| 19 | 1.35 | 34.0 | 0.76 | 6.5 | 1.08*d* | 17.2 | 0.98*d* | 13.2 |
| 20 | 1.35 | 34.0 | 1.68 | 70.0 | 1.07 | 16.8 | 0.97 | 12.8 |
| 21 | 1.35 | 34.0 | 1.71 | 74.0 | 1.05 | 16.0 | 0.97*d* | 12.8 |
| 22 | 1.34 | 34.0 | 1.68*d* | 70.0 | 1.05 | 16.0 | 0.97 | 12.8 |
| 23 | 1.33 | 33.0 | 1.65 | 66.0 | 1.00 | 14.0 | 0.97 | 12.8 |
| 24 | 1.27 | 28.0 | 1.60 | 60.0 | 1.15 | 21.0 | 0.95 | 12.0 |
| 25 | 1.20 | 24.0 | 1.55*d* | 54.0 | 1.10 | 18.5 | 0.95*d* | 12.0 |
| 26 | 1.15 | 21.0 | 1.50 | 49.0 | 1.08*d* | 17.2 | 0.95 | 12.0 |
| 27 | 1.10 | 18.5 | 1.45 | 44.0 | 1.05 | 16.0 | 0.95 | 12.0 |
| 28 | 1.10 | 18.5 | 1.38*d* | 37.0 | 1.05 | 16.0 | 0.95 | 12.0 |
| 29 | 1.40 | 39.0 | 1.30 | 31.0 | 1.05 | 16.0 | 0.95*d* | 12.0 |
| 30 | 1.45 | 44.0 | 1.15*d* | 21.0 | 1.05 | 16.0 | 0.95 | 12.0 |
| 31 | 1.58 | 58.0 | 1.00 | 14.0 | ..... | ..... | 0.95*d* | 12.0 |

*d* Estimated gauge height.

MONTHLY DISCHARGE of Rolph Creek near Kimball, for 1915.

(Drainage area 74 square miles.)

| Day. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (22-31) | 80. | 19.5 | 39.2 | 0.530 | 0.197 | 777 |
| April | 24. | 2.4 | 9.7 | 0.131 | 0.146 | 577 |
| May | 49. | 2.1 | 11.8 | 0.160 | 0.184 | 726 |
| June | 210. | 2.1 | 82.0 | 1.108 | 1.236 | 4,879 |
| July | 125. | 15.6 | 39.9 | 0.540 | 0.623 | 2,453 |
| August | 74. | 6.5 | 31.4 | 0.424 | 0.489 | 1,931 |
| September | 54. | 11.6 | 23.8 | 0.321 | 0.358 | 1,416 |
| October | 26. | 12.0 | 16.3 | 0.220 | 0.254 | 1,002 |
| The period | ..... | ..... | ..... | ..... | 3.487 | 13,761 |

LEE CREEK AT LAYTON'S RANCH.

*Location.*—SE. ¼ Sec. 27, Tp. 2, Rge. 26, W. 4th Mer., at B. Layton's ranch.

*Records available.*—May 25, 1913, to December 31, 1915.

*Gauge.*—Vertical staff. Zero of gauge maintained at elevation 88.14 feet during 1913–14 and to June 6, 1915. New gauge rod set in stream on June 6, 1915. Elevation of zero of rod 90.79 referred to permanent iron bench-mark.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet, located on the left bank about 10 feet above the gauge.

*Channel.*—Straight and quite uniform with a flat rock and boulder bed, not liable to shift.

*Discharge measurements.*—Made by wading at all ordinary stages, and from a temporary cable at very high stages.

*Winter flow.*—Obtained through the ice 800 feet above the gauge.

*Observer.*—B. Layton, Cardston, Alta.

DISCHARGE MEASUREMENTS of Lee Creek at Layton's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 4 | O. H. Hoover | 19.5 | 14.4 | 1.63 | 2.540 | 23.0 |
| Jan. 15 | do | 19.4 | 12.6 | 1.39 | 2.460 | 17.4 |
| Feb. 1 | W. A. Burton | 17.5 | 9.4 | 1.45 | 2.700 | 13.6 |
| Feb. 16 | J. E. Degnan | 17.0 | 9.6 | 1.39 | 3.005 | 13.3 |
| Mar. 8 | do | 16.5 | 7.5 | 1.26 | 2.145 | 9.6 |
| Mar. 22 | do | 51.5 | 41.7 | 1.36 | 2.150 | 57.0 |
| April 7 | V. A. Newhall | 48.5 | 40.6 | 1.55 | 2.070 | 63.0 |
| May 19 | do | 67.0 | 91.0 | 2.70 | 2.640 | 246.0 |
| June 26 | do | 71.0 | 113.7 | 3.10 | 2.705*f* | 353.0 |
| July 6 | do | 66.0 | 87.6 | 2.37 | 2.200 | 208.0 |
| July 28 | do | 68.4 | 97.2 | 2.85 | 2.390 | 277.0 |
| Aug. 21 | do | 59.4 | 76.0 | 2.50 | 2.160 | 190.0 |
| Sept. 3 | W. A. Burton | 66.5 | 98.2 | 2.90 | 2.500 | 284.0 |
| Oct. 19 | V. A. Newhall | 53.5 | 65.8 | 2.08 | 1.950 | 137.0 |
| Nov. 15 | W. H. Storey | 47.5 | 51.0 | 1.37 | 1.750 | 70.0 |
| Nov. 19 | do | 49.0 | 52.9 | 1.24 | 1.710 | 67.0 |
| Nov. 29 | do | 49.0 | 46.8 | 1.20 | 1.660 | 56.0 |
| Dec. 10 | do | 40.0 | 25.7 | 1.11 | 1.360 | 29.0 |
| Dec. 29 | do | 34.0 | 19.1 | 1.11 | 1.980 | 21.0 |

*f* New gauge station.

DAILY GAUGE HEIGHT AND DISCHARGE of Lee Creek at Layton's Ranch, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge | Gauge Height. | Discharge | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.35*d* | 21.0*a* | 2.69 | 13.6 | 2.59 | 11.6 | 1.97 | 45 | 2.48 | 179 | 2.25 | 103 |
| 2 | 2.54 | 22.0 | 2.70 | 14.0 | 2.57 | 10.6 | 2.01 | 52 | 2.81 | 346 | 2.48 | 179 |
| 3 | 2.55 | 23.0 | 2.74 | 14.2 | 2.53 | 9.9 | 2.03 | 55 | 2.80 | 340 | 2.98 | 444 |
| 4 | 2.50 | 23.0 | 2.76 | 14.5 | 2.56 | 9.4 | 2.04 | 57 | 2.77 | 323 | 2.95*d* | 427 |
| 5 | 2.50 | 23.0 | 2.71 | 14.8 | 2.66 | 9.3 | 2.07 | 63 | 2.64 | 253 | 2.92*d* | 410 |
| 6 | 2.54 | 23.0 | 2.67 | 14.8 | 2.73 | 9.3 | 2.08 | 64 | 2.30 | 117 | 2.89*d* | 392 |
| 7 | 2.56 | 22.0 | 2.62 | 14.8 | 2.77 | 9.4 | 2.07 | 63 | 2.27 | 109 | 2.86*f* | 413 |
| 8 | 2.59 | 21.0 | 2.52 | 14.4 | 2.85 | 9.6 | 2.05 | 59 | 2.25 | 103 | 2.64 | 343 |
| 9 | 2.58 | 20.0 | 2.57 | 14.1 | 2.90 | 9.8 | 1.98 | 47 | 2.23 | 98 | 2.57 | 320 |
| 10 | 2.57 | 19.4 | 2.62 | 13.8 | 2.92 | 10.0 | 2.01 | 52 | 2.21 | 93 | 3.25 | 543 |
| 11 | 2.46 | 18.6 | 2.54 | 13.0 | 2.92*d* | 10.3 | 2.02 | 54 | 2.21 | 93 | 3.00 | 458 |
| 12 | 2.41 | 18.1 | 2.59 | 12.8 | 2.91 | 10.6 | 2.04 | 57 | 2.20 | 90 | 2.95 | 442 |
| 13 | 2.39 | 17.8 | 2.66*d* | 12.6 | 2.91 | 11.0 | 2.04 | 57 | 2.38 | 142 | 2.87 | 416 |
| 14 | 2.42 | 17.6 | 2.74 | 12.8 | 2.87 | 11.3 | 2.14 | 76 | 2.47 | 174 | 3.12 | 499 |
| 15 | 2.45 | 17.4 | 2.84 | 13.0 | 2.87 | 11.8 | 2.15 | 78 | 2.75 | 311 | 3.30 | 560 |
| 16 | 2.48 | 17.3 | 2.85 | 13.4 | 2.87 | 12.3 | 2.12 | 72 | 2.71 | 289 | 2.91 | 429 |
| 17 | 2.57 | 17.0 | 2.82 | 13.8 | 2.82 | 13.0 | 2.13 | 74 | 2.64 | 253 | 2.90 | 426 |
| 18 | 2.56*d* | 16.8 | 2.80 | 14.1 | 2.72 | 14.1 | 2.12 | 72 | 2.57 | 219 | 3.05 | 475 |
| 19 | 2.55 | 16.2 | 2.80 | 14.2 | 2.52*d* | 16.2 | 2.10 | 68 | 2.64 | 253 | 3.02 | 465 |
| 20 | 2.57 | 15.5 | 2.50 | 14.0 | 2.32 | 19.9 | 2.07 | 63 | 2.45 | 166 | 2.70 | 362 |
| 21 | 2.58 | 14.7 | 2.49 | 12.5 | 2.21 | 26.0*a* | 2.06 | 61 | 2.42 | 155 | 2.45 | 282 |
| 22 | 2.60 | 14.1 | 2.39 | 11.8 | 2.15 | 78.0 | 2.05 | 59 | 2.40 | 148 | 2.30 | 234 |
| 23 | 2.62 | 13.8 | 2.31 | 11.9 | 2.20 | 90.0 | 2.03 | 55 | 2.38 | 142 | 2.25 | 219 |
| 24 | 2.64*d* | 13.3 | 2.28 | 13.0 | 2.20 | 90.0 | 2.03 | 55 | 2.38 | 142 | 2.20 | 204 |
| 25 | 2.66 | 13.2 | 2.38 | 14.1 | 2.14 | 76.0 | 2.02 | 54 | 2.36 | 135 | 2.38 | 260 |
| 26 | 2.64 | 13.0 | 2.93 | 14.5 | 1.84 | 29.0 | 2.02 | 54 | 2.34 | 129 | 2.71 | 365 |
| 27 | 2.64 | 13.0 | 2.62 | 14.3 | 1.86 | 31.0 | 2.01 | 52 | 2.34 | 129 | 2.65 | 346 |
| 28 | 2.62 | 13.1 | 2.60*d* | 13.5 | 1.88 | 34.0 | 2.00 | 50 | 2.33 | 126 | 2.47 | 288 |
| 29 | 2.62 | 13.1 | ..... | ..... | 1.93 | 40.0 | 2.20 | 90 | 2.32 | 123 | 2.27 | 225 |
| 30 | 2.62 | 13.2 | ..... | ..... | 1.93 | 40.0 | 2.30 | 117 | 2.32 | 123 | 2.32 | 240 |
| 31 | 2.66*d* | 13.2 | ..... | ..... | 1.95 | 42.0 | ... | ... | 2.30 | 117 | ... | ... |

*a* to *a* Ice conditions.
*b* to *b* Open water conditions.
*d* Estimated gauge height.
*f* New gauge station after June 6.

DAILY GAUGE HEIGHT AND DISCHARGE of Lee Creek at Layton's Ranch, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.30 | 234 | 2.22 | 210 | 1.31 | 26 | 1.68 | 60 | 1.62 | 49 | 1.69 | 62 |
| 2 | 2.30 | 234 | 2.20 | 204 | 1.57 | 41 | 1.72 | 69 | 1.60 | 45 | 1.67 | 58 |
| 3 | 2.26 | 222 | 2.16 | 192 | 2.62 | 336 | 1.78 | 83 | 1.60 | 45 | 1.66 | 56 |
| 4 | 2.23 | 213 | 2.10 | 174 | 1.95 | 129 | 1.86 | 104 | 1.59 | 44 | 1.66 | 56 |
| 5 | 2.20 | 204 | 2.03 | 153 | 1.70 | 64 | 1.85 | 101 | 1.59 | 44 | 1.66 | 56 |
| 6 | 2.23 | 213 | 1.93 | 123 | 1.64 | 52 | 1.87 | 107 | 1.58 | 42 | 1.68 | 60 |
| 7 | 2.18 | 198 | 1.90 | 115 | 1.60 | 45 | 1.86 | 104 | 1.58 | 42 | 1.68 | 60 |
| 8 | 2.10 | 174 | 1.85 | 101 | 1.54 | 37 | 1.86 | 104 | 1.58 | 42 | 1.69 | 62 |
| 9 | 2.00 | 144 | 1.80 | 88 | 1.75 | 76 | 1.82 | 93 | 1.60 | 45 | 1.53*d* | 36 |
| 10 | 1.95 | 129 | 1.76 | 78 | 1.85 | 101 | 1.88 | 93 | 1.60 | 45 | 1.36 | 27 |
| 11 | 1.90 | 115 | 1.71 | 66 | 1.78 | 83 | 1.86 | 104 | 1.60 | 45 | 1.38 | 28 |
| 12 | 1.85 | 101 | 1.68 | 70 | 1.72 | 69 | 1.82 | 93 | 1.60 | 45 | 1.38 | 28 |
| 13 | 1.90 | 115 | 1.75 | 76 | 1.75 | 76 | 1.88 | 109 | 1.63 | 50 | 1.39 | 29 |
| 14 | 1.85 | 101 | 1.69 | 62 | 1.70 | 64 | 1.88 | 109 | 1.65 | 54 | 1.43 | 30 |
| 15 | 1.80 | 88 | 1.69 | 62 | 1.68 | 60 | 1.89 | 112 | 1.75 | 76 | 1.45*g* | 31 |
| 16 | 1.76 | 78 | 1.65 | 54 | 1.68 | 60 | 1.90 | 115 | 1.69 | 62 | 1.41 | 29 |
| 17 | 1.73 | 71 | 1.63 | 50 | 1.67 | 58 | 1.90 | 115 | 1.70 | 64 | 1.37 | 28 |
| 18 | 2.12 | 180 | 1.57 | 41 | 1.64 | 52 | 1.92 | 121 | 1.72 | 69 | 1.35 | 27 |
| 19 | 2.09 | 171 | 1.55 | 38 | 1.78 | 83 | 1.93 | 123 | 1.71 | 66 | 1.34*d* | 27 |
| 20 | 1.96 | 132 | 2.60 | 330 | 1.75 | 76 | 1.94 | 126 | 1.72 | 69 | 1.33 | 27 |
| 21 | 1.80 | 88 | 2.00 | 144 | 1.70 | 64 | 1.90 | 115 | 1.72 | 69 | 1.32 | 26 |
| 22 | 1.76 | 78 | 1.75 | 76 | 1.68 | 60 | 1.84 | 98 | 1.72 | 69 | 1.33 | 27 |
| 23 | 1.68 | 60 | 1.70 | 64 | 1.66 | 56 | 1.78 | 83 | 1.73 | 71 | 1.32 | 26 |
| 24 | 1.66 | 56 | 1.65 | 54 | 1.64 | 52 | 1.75 | 76 | 1.73 | 71 | 1.34 | 27 |
| 25 | 1.74 | 74 | 1.54 | 37 | 1.68 | 60 | 1.73 | 71 | 1.74 | 74 | 1.34 | 27 |
| 26 | 1.78 | 83 | 1.52 | 36 | 1.67 | 58 | 1.70 | 64 | 1.69 | 62 | 1.33 | 27 |
| 27 | 2.15 | 189 | 1.45 | 31 | 1.66 | 56 | 1.68 | 60 | 1.67 | 58 | 1.32 | 26 |
| 28 | 2.38 | 260 | 1.42 | 30 | 1.63 | 50 | 1.66 | 56 | 1.66*d* | 56 | 1.32 | 26 |
| 29 | 2.30 | 234 | 1.40 | 29 | 1.61 | 47 | 1.65 | 54 | 1.66 | 56 | 1.37 | 28 |
| 30 | 2.27*d* | 225 | 1.38 | 28 | 1.60 | 45 | 1.64 | 52 | 1.68*d* | 60 | 1.39 | 29 |
| 31 | 2.24*d* | 216 | 1.34 | 27 | ..... | ..... | 1.63*d* | 50 | ..... | ..... | 1.45*g* | 31 |

*a* to *a* Ice conditions.
*b* to *b* Open water conditions.
*d* Estimated gauge height.
*f* New gauge station after June 6.
*g* to *g* Gauge height of bottom of ice, and open water curve used.

MONTHLY DISCHARGE of Lee Creek at Layton's Ranch, for 1915.

(Drainage area 92 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 23.0 | 13.0 | 17.3 | 0.188 | 0.217 | 1,064 |
| February | 14.8 | 11.8 | 13.7 | 0.149 | 0.155 | 761 |
| March | 90.0 | 9.3 | 26.0 | 0.282 | 0.325 | 1,599 |
| April | 117.0 | 45.0 | 62.5 | 0.680 | 0.759 | 3,719 |
| May | 346.0 | 90.0 | 174.8 | 1.900 | 2.190 | 10,748 |
| June | 560.0 | 103.0 | 359.0 | 3.902 | 4.353 | 21,362 |
| July | 260.0 | 56.0 | 151.0 | 1.641 | 1.892 | 9,285 |
| August | 330.0 | 27.0 | 91.7 | 1.000 | 1.153 | 5,638 |
| September | 336.0 | 26.0 | 71.2 | 0.774 | 0.864 | 4,237 |
| October | 126.0 | 50.0 | 91.1 | 0.990 | 1.141 | 5,602 |
| November | 76.0 | 42.0 | 56.3 | 0.612 | 0.683 | 3,350 |
| December | 62.0 | 26.0 | 36.0 | 0.391 | 0.451 | 2,214 |
| The year | ..... | ..... | ..... | ..... | 14.183 | 69,579 |

PINEPOUND CREEK AT PACKARD'S FARM.

*Location.*—On the NE. ¼ Sec. 29, Tp. 4, Rge. 24, W. 4th Mer.

*Records available.*—April 30, 1914, to October 31, 1915.

*Gauge.*—Vertical staff. Zero of gauge maintained at elevation of 93.00 feet since established.

*Bench-mark.*—Permanent iron bench-mark located 50 feet southeast of the staff gauge on the right bank. Assumed elevation, 100.00 feet.

*Channel.*—Composed of sand, gravel and small stones, not liable to shift on account of the good control, located about 100 feet below the gauge.

*Discharge measurements.*—Made by wading.

*Winter flow.*—Station discontinued during winter season.

*Observer.*—D. M. Boyd, Spring Coulee Post Office, Alta.

DISCHARGE MEASUREMENTS of Pinepound Creek at Packard's Farm, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean. Velocity. | Gauge Height. | Discharge |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 22 | J. E. Degnan | 20.5 | 23.90 | 2.35 | 3.22 | [illegible] 0 |
| April 16 | V. A. Newhall | 17.1 | 6.10 | 0.44 | 2 60 | [illegible] 6 |
| May 17 | do | 16 2 | 6.97 | 0.52 | 2.60 | [illegible] 6 |
| June 4 | W. A. Burton | 12.2 | 5.05 | 0.85 | 2.62 | 4 3 |
| June 24 | V. A. Newhall | 10.0 | 4 20 | 0 89 | 2.65 | [illegible] 7 |
| July 9 | do | 10 8 | 4.20 | 0.63 | 2.61 | [illegible] |
| July 31 | do | 26 5 | 26.32 | 2 00 | 3.19 | [illegible] |
| Sept. 7 | W. A. Burton | 10.7 | 4.38 | 0 56 | 2.63 | [illegible] 4 |
| Sept. 28 | do | 10.4 | 3.77 | 0 66 | 2 61 | [illegible] 5 |

DAILY GAUGE HEIGHT AND DISCHARGE of Pinepound Creek at Packard's Farm, for 1915.

| Day. | March. | | April. | | May. | | June | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | .... | ..... | 2.85 | 13.5 | 2.94 | 21.0 | 2.59 | 1 8 |
| 2 | .... | ..... | 2.91 | 18.4 | 2.90 | 17.5 | 2.62 | 2 6 |
| 3 | .... | ..... | 2.86 | 14.3 | 2.86 | 14.3 | 2.63 | 2 9 |
| 4 | .... | ..... | 2.84 | 12.9 | 2.87 | 15.1 | 2.62 | 2 6 |
| 5 | .... | ..... | 2.76 | 8.5 | 2.63 | 2.9 | 2.64 | 3.2 |
| 6 | .... | ..... | 2.74 | 7.5 | 2 61 | 2 3 | 2 67 | 4 3 |
| 7 | .... | ..... | 2.71 | 6.0 | 2.62 | 2 6 | 2.72 | 6 5 |
| 8 | .... | ..... | 2 66 | 3.9 | 2 60 | 2.0 | 2.69 | 5 1 |
| 9 | .... | ..... | 2 64 | 3.2 | 2 60 | 2.0 | 2 70 | 5 5 |
| 10 | .... | ..... | 2.64 | 3.2 | 2.59 | 1.8 | 2 67 | 4 3 |
| 11 | .... | ..... | 2 62 | 2 6 | 2 60 | 2 0 | 2.68 | 4 7 |
| 12 | .... | ..... | 2 61 | 2 3 | 2.60 | 2 0 | 2.69 | 5 1 |
| 13 | .... | ..... | 2 59 | 1 8 | 2.59 | 1.8 | 2.68 | 4 7 |
| 14 | .... | ..... | 2 58 | 1 6 | 2 64 | 3.2 | 2.66 | 3 9 |
| 15 | .... | ..... | 2.60 | 2.0 | 2.68 | 4 7 | 2.69 | 5 1 |
| 16 | .... | ..... | 2 60 | 2.0 | 2.62 | 2.6 | 2 66 | 3 9 |
| 17 | .... | ..... | 2.59 | 1.8 | 2.60 | 2.0 | 2.67 | 4 3 |
| 18 | .... | ..... | 2 58 | 1 6 | 2.61 | 2 3 | 2.68 | 4 7 |
| 19 | .... | ..... | 2.56 | 1 2 | 2 59 | 1.8 | 2 68 | 4 7 |
| 20 | .... | ..... | 2.55 | 1 0 | 2.60 | 2 0 | 2.67 | 4 3 |
| 21 | .... | ..... | 2 53 | 0 6 | 2.59 | 1 8 | 2 65 | 3 5 |
| 22 | .... | ..... | 2 59 | 1 8 | 2 58 | 1.6 | 2 63 | 2 9 |
| 23 | 3 22 | 57.0 | 2 55 | 1 0 | 2.59 | 1 8 | 2 64 | 3 2 |
| 24 | 3.06 | 34 0 | 2 54 | 0 8 | 2 59 | 1 8 | 2 65 | 3 5 |
| 25 | 2.95 | 22.0 | 2.52 | 0 4 | 2 58 | 1.6 | 2.64 | 3.2 |
| 26 | 2.73 | 7.0 | 2.51 | 0 2 | 2 59 | 1 8 | 3 15 | 46 [illegible] |
| 27 | 2 65 | 3 5 | 2 50 | 0 0 | 2 60 | 2.0 | 3 03 | 30 0 |
| 28 | 2.68 | 4.7 | 3.65 | 183 0 | 2 59 | 1.8 | 3 19 | 52 [illegible] |
| 29 | 2 71 | 6 0 | 3.40 | 96 0 | 2 60 | 2 0 | 3 17 | 49 0 |
| 30 | 2.79 | 10 0 | 3 05 | 32 5 | 2 60 | 2 0 | 3 16 | 48 [illegible] |
| 31 | 2 83 | 12 3 | | | 2.61 | 2 3 | | |

DAILY GAUGE HEIGHT AND DISCHARGE of Pinepound Creek at Packard's Farm, for 1915. —*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.90 | 17.5 | 3.16 | 48.0 | 2.60 | 2.0 | 2.63 | 2.9 |
| 2 | 2.65 | 3.5 | 2.94 | 21.0 | 2.63 | 2.9 | 2.65 | 3.5 |
| 3 | 2.63 | 2.9 | 2.68 | 4.7 | 2.67 | 4.3 | 2.66 | 3.9 |
| 4 | 2.60 | 2.0 | 2.66 | 3.9 | 2.64 | 3.2 | 2.63 | 2.9 |
| 5 | 2.60 | 2.0 | 2.64 | 3.2 | 2.63 | 2.9 | 2.65 | 3.5 |
| 6 | 2.59 | 1.8 | 2.65 | 3.5 | 2.61 | 2.3 | 2.64 | 3.2 |
| 7 | 2.60 | 2.0 | 2.66 | 3.9 | 2.63 | 2.9 | 2.66 | 3.9 |
| 8 | 2.59 | 1.8 | 2.64 | 3.2 | 2.64 | 3.2 | 2.65 | 3.5 |
| 9 | 2.61 | 2.3 | 2.65 | 3.5 | 2.62 | 2.6 | 2.63 | 2.9 |
| 10 | 2.60 | 2.0 | 2.66 | 3.9 | 2.65 | 3.5 | 2.64 | 3.2 |
| 11 | 2.59 | 1.8 | 2.64 | 3.2 | 2.64 | 3.2 | 2.64 | 3.2 |
| 12 | 2.60 | 2.0 | 2.63 | 2.9 | 2.66 | 3.9 | 2.65 | 3.5 |
| 13 | 2.60 | 2.0 | 2.66 | 3.9 | 2.67 | 4.3 | 2.64 | 3.2 |
| 14 | 2.61 | 2.3 | 2.63 | 2.9 | 2.65 | 3.5 | 2.64 | 3.2 |
| 15 | 2.60 | 2.0 | 2.64 | 3.2 | 2.63 | 2.9 | 2.63 | 2.9 |
| 16 | 2.60 | 2.0 | 2.63 | 2.9 | 2.61 | 2.3 | 2.62 | 2.6 |
| 17 | 2.61 | 2.3 | 2.61 | 2.3 | 2.63 | 2.9 | 2.62 | 2.6 |
| 18 | 2.63 | 2.9 | 2.56 | 1.2 | 2.67 | 4.3 | 2.61 | 2.3 |
| 19 | 2.62 | 2.6 | 2.60 | 2.0 | 2.65 | 3.5 | 2.61 | 2.3 |
| 20 | 2.61 | 2.3 | 2.61 | 2.3 | 2.64 | 3.2 | 2.60 | 2.0 |
| 21 | 2.60 | 2.0 | 2.67 | 4.3 | 2.65 | 3.5 | 2.60 | 2.0 |
| 22 | 2.60 | 2.0 | 2.63 | 2.9 | 2.66 | 3.9 | 2.59 | 1.8 |
| 23 | 2.62 | 2.6 | 2.60 | 2.0 | 2.65 | 3.5 | 2.60 | 2.0 |
| 24 | 2.61 | 2.3 | 2.62 | 2.6 | 2.67 | 4.3 | 2.59 | 1.8 |
| 25 | 2.60 | 2.0 | 2.61 | 2.3 | 2.66 | 3.9 | 2.58 | 1.6 |
| 26 | 2.60 | 2.0 | 2.59 | 1.8 | 2.68 | 4.7 | 2.57 | 1.4 |
| 27 | 2.61 | 2.3 | 2.60 | 2.0 | 2.64 | 3.2 | 2.55 | 1.0 |
| 28 | 3.34 | 82.0 | 2.60 | 2.0 | 2.61 | 2.3 | 2.54 | 0.8 |
| 29 | 2.90 | 17.5 | 2.58 | 1.6 | 2.60 | 2.0 | 2.52 | 0.4 |
| 30 | 2.68 | 4.7 | 2.61 | 2.3 | 2.62 | 2.6 | 2.49 | 0.0 |
| 31 | 3.17 | 49.0 | 2.63 | 2.9 | ..... | ..... | 2.48 | 0.0 |

MONTHLY DISCHARGE of Pinepound Creek at Packard's Farm, for 1915.

(Drainage area *a* square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (23-31) | 57.0 | 3.5 | 17.40 | ..... | ..... | 311 |
| April | 183.0 | 0.0 | 14.19 | ..... | ..... | 844 |
| May | 21.0 | 1.6 | 4.08 | ..... | ..... | 251 |
| June | 52.0 | 1.8 | 10.85 | ..... | ..... | 646 |
| July | 82.0 | 1.8 | 7.37 | ..... | ..... | 453 |
| August | 48.0 | 1.2 | 4.91 | ..... | ..... | 302 |
| September | 4.7 | 2.0 | 3.26 | ..... | ..... | 194 |
| October | 3.9 | 0.0 | 2.39 | ..... | ..... | 147 |
| The period | ..... | ..... | ..... | ..... | ..... | 3,148 |

*a* Owing to the fact that a portion of the discharge is waste water from the Alberta Railway and Irrigation Company's canal, the drainage area has not been taken out.

ALBERTA RAILWAY AND IRRIGATION COMPANY'S CANAL AT SPRING COULEE.

*Location.*—On the NW. ¼ Sec. 28, Tp. 4, Rge. 23, W. 4th Mer.

*Records available.*—May 1, 1914, to October 11, 1915.

*Gauge.*—Vertical staff. Zero of gauge maintained at elevation 87.68 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark set 30 feet southwest of rod. Assumed elevation, 100.00 feet.

*Channel.*—Straight for 200 feet above and 100 feet below the cable. The banks are steep and high and the stream bed consists of sand, clay and small stone, liable to shift.

*Discharge measurements.*—Made from a temporary cable structure located 150 feet below the gauge.

*Observer.*—D. M. Boyd, Spring Coulee Post Office, Alta.

*Remarks.*—Records may be obtained only during the irrigating season.

DISCHARGE MEASUREMENTS of Alberta Railway and Irrigation Company's Canal at Spring Coulee, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 17 | V. A. Newhall | 47.5 | 101.6 | 3.54 | 3.93 | 360 |
| June 4 | W. A. Burton | 47.5 | 98.0 | 3.66 | 3.92 | 359 |
| June 24 | V. A. Newhall | 48.0 | 97.3 | 3.27 | 3.62 | 318 |
| July 9 | do | 46.5 | 76.7 | 2.89 | 3.22 | 221 |
| July 31 | do | 45.5 | 63.8 | 2.75 | 2.94 | 176 |
| Sept. 7 | do | 45.5 | 68.1 | 2.82 | 3.08 | 192 |
| Sept. 28 | W. A. Burton | 47.0 | 84.5 | 3.10 | 3.32 | 262 |

DAILY GAUGE HEIGHT AND DISCHARGE of Alberta Railway and Irrigation Company's Canal at Spring Coulee, for 1915.

| Day. | May. | | June. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.10 | 233 | 3.85 | 349 |
| 2 | 3.20 | 247 | 3.88 | 354 |
| 3 | 3.19 | 246 | 3.89 | 355 |
| 4 | 3.34 | 267 | 3.92 | 360 |
| 5 | 3.50 | 293 | 3.99 | 371 |
| 6 | 3.49 | 291 | 3.94 | 363 |
| 7 | 3.48 | 290 | 3.91 | 359 |
| 8 | 3.49 | 291 | 3.92 | 360 |
| 9 | 3.50 | 293 | 3.80 | 341 |
| 10 | 3.48 | 290 | 3.79 | 339 |
| 11 | 3.49 | 291 | 3.65 | 317 |
| 12 | 3.48 | 290 | 3.74 | 331 |
| 13 | 3.49 | 291 | 3.69 | 323 |
| 14 | 3.56 | 303 | 3.72 | 328 |
| 15 | 3.67 | 320 | 3.75 | 333 |
| 16 | 3.84 | 347 | 3.77 | 336 |
| 17 | 3.93 | 362 | 3.69 | 323 |
| 18 | 3.92 | 360 | 3.71 | 327 |
| 19 | 3.84 | 347 | 3.70 | 325 |
| 20 | 3.78 | 338 | 3.69 | 323 |
| 21 | 3.76 | 335 | 3.65 | 317 |
| 22 | 3.92 | 360 | 3.60 | 309 |
| 23 | 3.90 | 357 | 3.59 | 307 |
| 24 | 3.87 | 352 | 3.62 | 312 |
| 25 | 3.86 | 350 | 3.50 | 290 |
| 26 | 3.85 | 349 | 2.61 | 360 |
| 27 | 3.84 | 347 | 2.00*d* | 88 |
| 28 | 3.83 | 346 | 3.10 | 225 |
| 29 | 3.87 | 352 | 3.05 | 217 |
| 30 | 3.84 | 347 | 3.04 | 214 |
| 31 | 3.74 | 331 | | |

Water in canal from April 28 to April 30 but not up to base of rod.
*c* to *c* Shifting conditions.
*d* Estimated gauge height.

DAILY GAUGE HEIGHT AND DISCHARGE of Alberta Railway and Irrigation Company's Canal at Spring Coulee, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.07*c* | 216 | 2.90 | 168 | 3.04 | 190 | 3.32 | 264 |
| 2 | 3.25 | 240 | 2.85 | 160 | 3.02 | 187 | 3.28 | 258 |
| 3 | 3.38 | 256 | 3.09 | 198 | 3.16 | 210 | 3.31 | 263 |
| 4 | 3.34 | 248 | 3.02 | 187 | 3.17 | 211 | 3.32 | 264 |
| 5 | 3.33 | 244 | 3.03 | 189 | 3.12 | 203 | 3.35 | 269 |
| 6 | 3.32 | 242 | 3.08 | 197 | 3.09 | 198 | 3.33 | 266 |
| 7 | 3.22 | 225 | 3.06 | 194 | 3.08*c* | 197 | 3.31 | 263 |
| 8 | 3.24 | 224 | 3.05 | 192 | 3.09 | 200 | 3.32 | 264 |
| 9 | 3.22*c* | 220 | 3.07 | 195 | 3.07 | 198 | 3.06 | 227 |
| 10 | 3.23 | 221 | 3.09 | 198 | 3.07 | 199 | 2.94 | 211 |
| 11 | 3.20 | 216 | 3.06 | 194 | 3.09 | 204 | 2.90 | 205 |
| 12 | 3.21 | 218 | 3.09 | 198 | 3.08 | 206 | Water below zero. | |
| 13 | 3.20 | 216 | 3.12 | 203 | 3.10 | 208 | from Oct. 12th to | |
| 14 | 3.24 | 222 | 3.08 | 197 | 3.29 | 240 | Oct. 31st. | |
| 15 | 3.21 | 218 | 3.06 | 194 | 3.28 | 240 | ... | |
| 16 | 3.22 | 219 | 3.07 | 195 | 3.26 | 238 | ..... | |
| 17 | 3.25 | 224 | 3.03 | 189 | 3.24 | 220 | ..... | |
| 18 | 3.28 | 229 | 3.04 | 190 | 3.35 | 256 | ..... | |
| 19 | 3.24 | 222 | 3.05 | 192 | 3.32 | 252 | ..... | |
| 20 | 3.24 | 222 | 3.06 | 194 | 3.29 | 248 | ..... | |
| 21 | 3.23 | 221 | 3.12 | 203 | 3.29 | 250 | ..... | |
| 22 | 3.22 | 219 | 3.07 | 195 | 3.28 | 249 | ..... | |
| 23 | 3.21 | 218 | 3.05 | 192 | 3.27 | 249 | ..... | |
| 24 | 3.23 | 221 | 3.06 | 194 | 3.30 | 256 | ..... | |
| 25 | 3.22 | 219 | 3.04 | 190 | 3.28 | 254 | ..... | |
| 26 | 3.25 | 224 | 3.03 | 189 | 3.25 | 250 | ..... | |
| 27 | 3.24 | 222 | 3.01 | 186 | 3.24 | 249 | ... | |
| 28 | 4.09 | 365 | 3.02 | 187 | 3.32*c* | 264 | ..... | |
| 29 | 3.20 | 216 | 3.04 | 190 | 3.30 | 261 | ..... | |
| 30 | 3.05 | 192 | 3.05 | 192 | 3.31 | 263 | ..... | |
| 31 | 2.94 | 174 | 3.06 | 194 | ..... | ..... | ..... | |

*c* to *c* Shifting conditions.

MONTHLY DISCHARGE of Alberta Railway and Irrigation Company's Canal at Spring Coulee, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| April (28-30) | ..... | ..... | ..... | ..... |
| May | 362 | 233 | 317 | 19,467 |
| June | 363 | 88 | 315 | 18,756 |
| July | 365 | 174 | 227 | 13,952 |
| August | 203 | 160 | 192 | 11,775 |
| September | 264 | 189 | 228 | 13,585 |
| October (1-12) | 269 | 205 | 250 | 5,460 |
| The period | ..... | ..... | ..... | 82,995 |

Water in canal April 28 to 30, but not touching rod.
Water in canal below rod from October 12 to 31.

POTHOLE CREEK NEAR MAGRATH (UPPER STATION).

*Location.*—On the NW. ¼ Sec. 10, Tp. 5, Rge. 22, W. 4th Mer., three and one-half miles southwest of Magrath.

*Records available.*—April 27, 1914, to October 31. 1915.

*Gauge.*—Vertical staff. Zero of gauge maintained at elevation of 92.68 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark, located on the right bank thirty feet south of the staff gauge. Assumed elevation, 100 00 feet.

*Channel.*—Straight for about 100 feet above and 50 feet below gauge, composed of fine gravel and stones and liable to shift during floods.

*Discharge measurements.*—Made by wading.

*Winter flow.*—Station discontinued during winter season.

*Observer.*—L. A. Harrison.

DISCHARGE MEASUREMENTS of Pothole (Upper Station) Creek near Magrath, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 20 | J. E. Degnan | 36.0 | 34.0 | 1.70 | 2.170 | 57.00 |
| April 15 | V. A. Newhall | 9.0 | 6.0 | 1.50 | 1.185 | 9.00 |
| May 13 | do | 8 0 | 3.3 | 0.75 | 0 950 | 2.50 |
| June 4 | do | 46.5 | 109.1 | 2.13 | 4.200 | 233 00 |
| June 23 | do | 14.5 | 6.8 | 2.21 | 1.310 | 15.00 |
| July 8 | do | 8.7 | 5.8 | 1.41 | 1.180 | 8.20 |
| July 30 | do | 40.5 | 44.2 | 2.40 | 2.585 | 106.00 |
| Sept. 6 | W. A. Burton | 14.5 | 6.9 | 1.90 | 1.250 | 13.10 |
| Sept. 28 | V. A. Newhall | 8.6 | 4.6 | 1.48 | 1.080 | 6 80 |

DAILY GAUGE HEIGHT AND DISCHARGE of Pothole (Upper Station) Creek near Magrath, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.90 | 41 0 | 0.96 | 3.1 | 0.92 | 2 2 |
| 2 | ..... | ..... | 2.01 | 48.0 | 1.01 | 4.3 | 1.80 | 35.0 |
| 3 | ..... | ..... | 2.05 | 50.0 | 1.04 | 5.0 | 5.45 | 348 0 |
| 4 | ..... | ..... | 2.09 | 53.0 | 1.03 | 4.8 | 4.20 | 235.0 |
| 5 | ..... | ..... | 1.65 | 27.0 | 1.01 | 4.3 | 5.20 | 325.0 |
| 6 | ..... | ..... | 1.56 | 22.0 | 1.05 | 5.3 | 3.60 | 181.0 |
| 7 | ..... | ..... | 1.47 | 18.8 | 1.12 | 7.2 | 2.20 | 61 0 |
| 8 | ..... | ..... | 1.41 | 16.4 | 1.08 | 6 1 | 1.90 | 41.0 |
| 9 | ..... | ..... | 1.30 | 12.5 | 1.05 | 5.3 | 1 86 | 39 0 |
| 10 | ..... | ..... | 1.20 | 9.5 | 1.00 | 4.0 | 1.77 | 33.0 |
| 11 | ..... | ..... | 1.18 | 8.9 | 0.95 | 2.9 | 1.60 | 24.0 |
| 12 | ..... | ..... | 1.15 | 8.0 | 0.90 | 1 8 | 1.45 | 18 0 |
| 13 | ..... | ..... | 1.20 | 9.5 | 0 85 | 1 3 | 1.48 | 19 2 |
| 14 | 2.50 | 85.0 | 1.19 | 9 2 | 0 95 | 2.9 | 1.50 | 20 0 |
| 15 | 3.50 | 172 0 | 1.14 | 7.7 | 2 10 | 54 0 | 1 55 | 22 0 |
| 16 | 5.10 | 316.0 | 1.12 | 7 2 | 1 90 | 41 0 | 1.56 | 22 0 |
| 17 | 6.01 | 398 0 | 1 12 | 7.2 | 2 90 | 118 0 | 1.58 | 24 0 |
| 18 | 4.75 | 284.0 | 1.14 | 7.7 | 2.41 | 78 0 | 1 57 | 23 0 |
| 19 | 3.50 | 172.0 | 1.05 | 5.3 | 1.72 | 30 0 | 3 05 | 132 0 |
| 20 | 2 25 | 65 0 | 1 03 | 4 8 | 1.61 | 25 0 | 2 02 | 48 0 |
| 21 | 3.09 | 135.0 | 1 02 | 4.5 | 1.42 | 16 8 | 1 35 | 14 0 |
| 22 | 4.00 | 217 0 | 1 00 | 4 0 | 1 35 | 14 0 | 1 39 | 15 6 |
| 23 | 3.90 | 208 0 | 1 00 | 4 0 | 1 32 | 13 1 | 1 30 | 12 5 |
| 24 | 3.10 | 136 0 | 0 99 | 3 8 | 1 28 | 11 9 | 1 32 | 13 1 |
| 25 | 2 99 | 126 0 | 0 98 | 3 6 | 1 22 | 10 1 | 3 25 | 150 0 |
| 26 | 2 23 | 63 0 | 0 96 | 3 1 | 1.20 | 9 5 | 2 90 | 118 0 |
| 27 | 1 83 | 37 0 | 0 94 | 2 7 | 1 15 | 8 0 | 2 85 | 114 0 |
| 28 | 1 50 | 20 0 | 0 92 | 2 2 | 1 10 | 6 6 | 2 87 | 115 0 |
| 29 | 1 50 | 20 0 | 0 90 | 1 8 | 1 02 | 4 5 | 2 36 | 74 0 |
| 30 | 1 59 | 24 0 | 0 91 | 2 0 | 0 96 | 3 1 | 2 00 | 47 0 |
| 31 | 1 67 | 28 0 | .. | | 0 94 | 2 7 | | |

DAILY GAUGE HEIGHT AND DISCHARGE of Pothole (Upper Station) Creek near Magrath, for 1915. —*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.71 | 30.0 | 1.55 | 22.0 | 0.95 | 2.9 | 0.22 | 0.00 |
| 2 | 1.65 | 27.0 | 1.49 | 19.6 | 0.90 | 1.8 | 0.35 | 0.00 |
| 3 | 1.61 | 25.0 | 1.47 | 18.8 | 1.00 | 4.0 | 0.34 | 0.00 |
| 4 | 1.57 | 23.0 | 1.41 | 16.4 | 1.00 | 4.0 | 0.34 | 0.00 |
| 5 | 1.41 | 16.4 | 1.33 | 13.4 | 1.00 | 4.0 | 0.33 | 0.00 |
| 6 | 1.25 | 11.0 | 1.29 | 12.2 | 1.25 | 11.0 | 0.32 | 0.00 |
| 7 | 1.20 | 9.5 | 1.23 | 10.4 | 1.00 | 4.0 | 0.32 | 0.00 |
| 8 | 1.15 | 8.0 | 1.10 | 6.6 | 1.00 | 4.0 | 0.31 | 0.00 |
| 9 | 1.10 | 6.6 | 1.04 | 5.0 | 1.00 | 4.0 | 0.31 | 0.00 |
| 10 | 1.05 | 5.3 | 1.00 | 4.0 | 1.05 | 5.3 | 0.30 | 0.00 |
| 11 | 1.04 | 5.0 | 1.01 | 4.3 | 1.10 | 6.6 | 0.30 | 0.00 |
| 12 | 1.05 | 5.3 | 0.98 | 3.6 | 1.10 | 6.6 | 0.35 | 0.00 |
| 13 | 1.06 | 5.6 | 0.98 | 3.6 | 1.15 | 8.0 | 0.32 | 0.00 |
| 14 | 1.05 | 5.3 | 1.00 | 4.0 | 1.20 | 9.5 | 0.31 | 0.00 |
| 15 | 1.06 | 5.6 | 1.01 | 4.3 | 1.20 | 9.5 | 0.31 | 0.00 |
| 16 | 1.06 | 5.6 | 2.00 | 47.0 | 1.25 | 11.0 | 0.30 | 0.00 |
| 17 | 1.07 | 5.8 | 2.00 | 47.0 | 1.25 | 11.0 | 0.29 | 0.00 |
| 18 | 1.09 | 6.3 | 1.95 | 44.0 | 1.40 | 16.0 | 0.32 | 0.00 |
| 19 | 1.12 | 7.2 | 1.91 | 42.0 | 1.30 | 12.5 | 0.35 | 0.00 |
| 20 | 1.15 | 8.0 | 1.85 | 38.0 | 1.27 | 11.6 | 0.38 | 0.00 |
| 21 | 1.15 | 8.0 | 1.54 | 22.0 | 1.23 | 10.4 | 0.41 | 0.00 |
| 22 | 1.14 | 7.7 | 1.20 | 9.5 | 1.19 | 9.2 | 0.44 | 0.04 |
| 23 | 1.15 | 8.0 | 1.20 | 9.5 | 1.08 | 6.1 | 0.47 | 0.07 |
| 24 | 1.15 | 8.0 | 1.10 | 6.6 | 0.96 | 3.1 | 0.51 | 0.11 |
| 25 | 1.17 | 8.6 | 1.10 | 6.6 | 0.84 | 1.2 | 0.53 | 0.13 |
| 26 | 1.18 | 8.9 | 1.00 | 4.0 | 0.72 | 0.5 | 0.55 | 0.15 |
| 27 | 1.48 | 19.2 | 1.00 | 4.0 | 0.65 | 0.3 | 0.58 | 0.18 |
| 28 | 1.97 | 45.0 | 1.00 | 4.0 | 1.08 | 6.1 | 0.60 | 0.20 |
| 29 | 2.56 | 90.0 | 1.00 | 4.0 | 0.28 | 0.0 | 0.63 | 0.26 |
| 30 | 2.70 | 101.0 | 0.95 | 2.9 | 0.26 | 0.0 | 0.64 | 0.28 |
| 31 | 1.85 | 38.0 | 0.95 | 2.9 | ..... | ..... | 0.66 | 0.32 |

MONTHLY DISCHARGE of Pothole (Upper Station) Creek near Magrath, for 1915.

(Drainage area 162 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (14-31) | 398.00 | 20.0 | 139.00 | 0.8590 | 0.5700 | 4,969 |
| April | 53.00 | 1.8 | 13.50 | 0.0830 | 0.0930 | 804 |
| May | 118.00 | 1.3 | 16.30 | 0.1010 | 0.1160 | 1,001 |
| June | 348.00 | 2.2 | 77.50 | 0.4790 | 0.5340 | 4,613 |
| July | 101.00 | 5.0 | 18.20 | 0.1120 | 0.1290 | 1,119 |
| August | 47.00 | 2.9 | 19.80 | 0.1220 | 0.1410 | 1,216 |
| September | 16.00 | 0.0 | 6.10 | 0.0380 | 0.0420 | 365 |
| October | 0.32 | 0.0 | 0.06 | 0.0003 | 0.0004 | 3 |
| The period | ..... | ..... | ..... | ..... | 1.6254 | 14,090 |

POTHOLE CREEK NEAR MAGRATH (LOWER STATION).

*Location.*—On the NE. ¼ Sec. 1, Tp. 6, Rge. 22, W. 4th Mer., three miles northeast of Magrath.

*Records available.*—April 28, 1914, to October 31, 1915.

*Gauge.*—Vertical staff. Zero of gauge maintained at elevation of 92.87 feet from April 28 to July 13, 1914. Gauge moved 336 feet downstream on July 13. Zero of gauge maintained at elevation of 93.42 feet since that date.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet, located on the left bank 50 feet from the staff.

*Channel.*—Composed of sand, gravel and clay, liable to shift during floods.

*Discharge measurements.*—Made by wading.

*Floods.*—Caused by overflow from Alberta Railway and Irrigation Company's Canal.

*Winter flow.*—Station discontinued during winter season.

*Observer.*—R. Hyden.

DISCHARGE MEASUREMENTS of Pothole Creek near Magrath (Lower Station), in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 20 | J. E. Degnan | 54.0 | 41.0 | 1.84 | 2.230 | 76.0 |
| April 15 | V. A. Newhall | 28.3 | 9.9 | 0.89 | 1.500 | 8.8 |
| May 13 | do | 41.5 | 27.4 | 1.86 | 1.920 | 52.0 |
| June 4 | do | 96.2 | 182.6 | 3.15 | 4.155 | 576.0 |
| June 23 | do | 65.0 | 67.9 | 2.17 | 2.820 | 147.0 |
| July 8 | do | 64.5 | 57.1 | 2.00 | 2.680 | 114.0 |
| July 30 | do | 69.0 | 88.6 | 2.95 | 3.130 | 261.0 |
| Sept. 6 | W. A. Burton | 51.0 | 40.7 | 1.92 | 2.420 | 78.0 |
| Sept. 28 | V. A. Newhall | 51.9 | 35.7 | 1.74 | 2.230 | 62.0 |

DAILY GAUGE HEIGHT AND DISCHARGE of Pothole Creek near Magrath (Lower Station), for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.85 | 38.0 | 2.30 | 85.0 | 2.52 | 119.0 |
| 2 | ..... | ..... | 1.85 | 38.0 | 2.21*d* | 73.0 | 2.53 | 120.0 |
| 3 | ..... | ..... | 2.05 | 56.0 | 2.13 | 64.0 | 3.34*d* | 322.0 |
| 4 | ..... | ..... | 1.92*d* | 44.0 | 2.12*d* | 63.0 | 4.16*c* | 577.0 |
| 5 | ..... | ..... | 1.80 | 34.0 | 2.12 | 63.0 | 4.00 | 520.0 |
| 6 | ..... | ..... | 1.75 | 30.0 | 2.13 | 64.0 | 3.64*d* | 394.0 |
| 7 | ..... | ..... | 1.72 | 28.0 | 1.95 | 46.0 | 3.28*d* | 274.0 |
| 8 | ..... | ..... | 1.68*d* | 25.0 | 1.90 | 42.0 | 2.92 | 170.0 |
| 9 | ..... | ..... | 1.65 | 23.0 | 1.88*d* | 40.0 | 2.93 | 173.0 |
| 10 | ..... | ..... | 1.55 | 17.0 | 1.85 | 38.0 | 2.94*d* | 175.0 |
| 11 | ..... | ..... | 1.54*d* | 16.4 | 1.90*d* | 42.0 | 2.95 | 178.0 |
| 12 | ..... | ..... | 1.54 | 16.4 | 1.95 | 46.0 | 2.85 | 153.0 |
| 13 | ..... | ..... | 1.53 | 15.8 | 2.00 | 51.0 | 2.85*d* | 153.0 |
| 14 | ..... | ..... | 1.53 | 15.8 | 2.45 | 107.0 | 2.85 | 153.0 |
| 15 | 2.50 | 115.0 | 1.50 | 14.0 | 2.64*d* | 141.0 | 2.85 | 153.0 |
| 16 | 3.00 | 225.0 | 1.50 | 14.0 | 2.84*d* | 185.0 | 2.90*d* | 165.0 |
| 17 | 4.50 | 686.0 | 1.50 | 14.0 | 3.03 | 233.0 | 2.95 | 178.0 |
| 18 | 4.50 | 686.0 | 1.45*d* | 11.0 | 2.88*d* | 194.0 | 2.94*d* | 175.0 |
| 19 | 2.40 | 99.0 | 1.40*d* | 8.0 | 2.73 | 160.0 | 2.94 | 175.0 |
| 20 | 2.23 | 76.0 | 1.35 | 6.0 | 2.52*d* | 119.0 | 2.88*d* | 160.0 |
| 21 | 2.56*d* | 126.0 | 1.35 | 6.0 | 2.30 | 85.0 | 2.83*d* | 148.0 |
| 22 | 2.90 | 199.0 | 1.34 | 5.6 | 2.29 | 84.0 | 2.77 | 134.0 |
| 23 | 2.92 | 204.0 | 1.34 | 5.6 | 2.34*d* | 91.0 | 2.84 | 151.0 |
| 24 | 2.95 | 212.0 | 1.34 | 5.6 | 2.40 | 99.0 | 2.80*d* | 141.0 |
| 25 | 2.61*d* | 135.0 | 1.34 | 5.6 | 2.55 | 124.0 | 2.76 | 132.0 |
| 26 | 2.27 | 81.0 | 1.29 | 3.6 | 2.54*d* | 122.0 | 4.00 | 520.0 |
| 27 | 1.45 | 11.0 | 1.28 | 3.2 | 2.53 | 120.0 | 3.50*d* | 346.0 |
| 28 | 1.58*d* | 18.8 | 1.69*d* | 25.0 | 2.56*d* | 126.0 | 3.00*d* | 191.0 |
| 29 | 1.70 | 26.0 | 2.10 | 61.0 | 2.58 | 129.0 | 2.50 | 87.0 |
| 30 | 1.75 | 30.0 | 2.40 | 99.0 | 2.56*d* | 126.0 | 2.30 | 67.0 |
| 31 | 1.80*d* | 34.0 | ..... | ..... | 2.53 | 120.0 | ..... | ..... |

*c* to *c* Shifting conditions.
*d* Estimated gauge height.

DAILY GAUGE HEIGHT AND DISCHARGE of Pothole Creek near Magrath (Lower Station), for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.54*c* | 93 | 2.95*d* | 204 | 2.00 | 50 | 2.40 | 76 |
| 2 | 2.55 | 94 | 2.90*d* | 189 | 2.30*d* | 67 | 2.45 | 81 |
| 3 | 2.53*d* | 91 | 2.85 | 173 | 2.60 | 101 | 2.45*d* | 81 |
| 4 | 2.52*d* | 90 | 2.85*d* | 172 | 2.49*d* | 86 | 2.45 | 81 |
| 5 | 2.50 | 87 | 2.85 | 171 | 2.38*d* | 74 | 2.50 | 87 |
| 6 | 2.85 | 153 | 2.65 | 123 | 2.27 | 65 | 2.72*d* | 123 |
| 7 | 2.76*d* | 132 | 2.60 | 122 | 2.10 | 54 | 2.95 | 178 |
| 8 | 2.68*c* | 115 | 2.55*d* | 102 | 2.10*d* | 54 | 2.98*d* | 186 |
| 9 | 2.64*d* | 108 | 2.50 | 93 | 2.10 | 54 | 3.00 | 191 |
| 10 | 2.60 | 103 | 2.50*d* | 92 | 2.14*d* | 56 | 2.65*d* | 110 |
| 11 | 2.60*d* | 103 | 2.49 | 89 | 2.18 | 59 | 2.30*d* | 67 |
| 12 | 2.60 | 104 | 2.39 | 76 | 2.17*d* | 58 | 1.95 | 48 |
| 13 | 2.60*d* | 104 | 2.44*dc* | 80 | 2.17*d* | 58 | 1.95 | 48 |
| 14 | 2.60 | 105 | 2.50 | 87 | 2.16 | 58 | 1.85*d* | 44 |
| 15 | 2.60*d* | 105 | 2.50*d* | 87 | 2.16 | 58 | 1.75 | 42 |
| 16 | 2.60 | 106 | 2.50 | 87 | 2.02*d* | 51 | 1.75 | 42 |
| 17 | 3.00 | 260 | 2.95 | 178 | 1.87 | 45 | 1.75*d* | 42 |
| 18 | 2.98*d* | 196 | 2.90*d* | 165 | 1.87 | 45 | 1.75 | 42 |
| 19 | 2.95 | 190 | 2.85 | 153 | 1.88*d* | 45 | 1.70*d* | 41 |
| 20 | 2.75 | 142 | 2.72*d* | 123 | 1.90 | 46 | 1.65 | 40 |
| 21 | 2.75 | 142 | 2.60 | 101 | 1.90*d* | 46 | 1.65*d* | 40 |
| 22 | 2.70*d* | 132 | 2.40*d* | 76 | 1.90 | 46 | 1.65 | 40 |
| 23 | 2.65 | 132 | 2.20 | 60 | 2.00*d* | 50 | 1.60 | 39 |
| 24 | 2.65*d* | 133 | 2.15*d* | 57 | 2.10 | 54 | 1.60*d* | 39 |
| 25 | 2.65*d* | 135 | 2.10 | 54 | 2.10 | 54 | 1.60 | 39 |
| 26 | 2.65 | 136 | 2.10*d* | 54 | 2.14*d* | 56 | 1.55 | 38 |
| 27 | 2.65 | 138 | 2.10 | 54 | 2.19*d* | 59 | 1.52*d* | 38 |
| 28 | 3.12*d* | 254 | 2.10 | 54 | 2.23 | 62 | 1.50 | 38 |
| 29 | 3.60 | 400 | 2.10*d* | 54 | 2.32*d* | 69 | 1.50*d* | 38 |
| 30 | 3.13*c* | 260 | 2.10 | 54 | 2.40 | 76 | 1.50 | 38 |
| 31 | 3.00 | 221 | 2.10 | 54 | ..... | ..... | 1.50*d* | 38 |

*c–c* Shifting conditions.
*d* Estimated gauge height.

MONTHLY DISCHARGE of Pothole Creek near Magrath (Lower Station), for 1915.

(Drainage area *a* square miles.)

| Month. | Discharge in Second-Feet. | | | Total Discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| March (15-31) | 686 | 11.0 | 174.3 | 5,877 |
| April | 99 | 3.2 | 22.8 | 1,358 |
| May | 233 | 38.0 | 99.4 | 6,113 |
| June | 577 | 67.0 | 213.5 | 12,702 |
| July | 400 | 87.0 | 147.2 | 9,053 |
| August | 204 | 54.0 | 104.4 | 6,422 |
| September | 101 | 45.0 | 58.5 | 3,483 |
| October | 191 | 38.0 | 67.0 | 4,120 |
| The period | ..... | ..... | ..... | 49,128 |

*a* Owing to the greater part of the discharge being waste water from the Alberta Railway Irrigation Company's canal, the drainage area has not been taken out.

ST. MARY RIVER AT WHITNEY'S RANCH.

*Location.*—On the NE. ¼ Sec. 26, Tp. 7, Rge. 22, W. 4th Mer.

*Records available.*—October 13, 1911, to December 31, 1915.

*Gauge.*—Vertical staff. Zero of gauge maintained at 87.55 feet during 1911; zero of gauge maintained at 89.13 feet during 1912; zero of gauge maintained at 89.15 feet during 1913; zero of gauge maintained at 88.15 feet during 1914–15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet, located near Mr. Whitney's house.

*Channel.*—Consists of gravel and is liable to shift.

*Discharge measurements.*—Made from a cable car located about 2,000 feet downstream from the gauge.

*Winter flow.*—Obtained through the ice 240 feet downstream from the cable.

*Observer.*—W. D. Whitney.

DISCHARGE MEASUREMENTS of St. Mary River at Whitney's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq.-ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 12 | O. H. Hoover | 101 | 117 | 1.51 | 1.84 | 177 |
| Jan. 27 | J. E. Degnan | 101 | 144 | 1.36 | 1.89 | 195 |
| Feb. 12 | do | 92 | 125 | 1.49 | 2.20 | 185 |
| Mar. 3 | do | 91 | 110 | 1.25 | 2.14 | 138 |
| Mar. 18 | P. H. Daniells | 260 | 513 | 3.84 | 2.42 | 1,969 |
| April 3 | do | 185 | 228 | 2.18 | 1.33 | 497 |
| April 15 | do | 184 | 227 | 2.24 | 1.29 | 509 |
| April 30 | do | 203 | 323 | 2.74 | 1.60 | 884 |
| May 13 | W. R. McCaffrey | 265 | 496 | 4.12 | 2.06 | 1,882 |
| May 27 | do | 233 | 392 | 3.16 | 1.82 | 1,238 |
| June 8 | do | 295 | 650 | 4.25 | 2.33 | 2,762 |
| June 22 | do | 288 | 575 | 4.08 | 2.23 | 2,346 |
| June 27 | J. E. Degnan | 312 | 773 | 4.71 | 2.57 | 3,642 |
| June 29 | do | 297 | 651 | 4.41 | 2.37 | 2,885 |
| July 13 | W. R. McCaffrey | 287 | 492 | 3.48 | 1.97 | 1,711 |
| July 23 | do | 254 | 413 | 3.10 | 1.80 | 1,283 |
| Aug. 11 | G. H. Whyte and W. R. McCaffrey | 233 | 369 | 2.82 | 1.67 | 1,046 |
| Aug. 24 | W. R. McCaffrey | 228 | 399 | 2.67 | 1.65 | 1,064 |
| Sept. 21 | do | 213 | 366 | 2.70 | 1.57 | [illegible] |
| Oct. 8 | W. H. Hannon | 229 | 315 | 3.92 | 1.72 | 1,236 |
| Oct. 27 | W. R. McCaffrey | 205 | 323 | 2.42 | 1.46 | 783 |
| Nov. 22 | W. H. Storey | 181 | 279 | 2.40 | 1.15 | 686 |
| Dec. 15 | do | 161 | 134 | 1.93 | 1.52 | 259 |

DAILY GAUGE HEIGHT AND DISCHARGE of St. Mary River at Whitney's Ranch, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.05s | 235 | 1.90 | 181 | 2.05 | 155 | 1.37 | 569 | 1.65*a* | 990 | 1.88 | 1,446 |
| 2 | 2.08 | 230 | 1.91 | 182 | 2.05 | 146 | 1.33 | 525 | 1.70 | 1,080 | 1.89 | 1,468 |
| 3 | 1.87 | 220 | 1.94 | 181 | 2.14 | 138 | 1.34 | 534 | 1.70 | 1,080 | 1.99 | 1,704 |
| 4 | 1.95 | 200 | 1.95 | 176 | 2.17 | 140 | 1.40 | 605 | 2.00 | 1,730 | 2.95 | 5,220 |
| 5 | 1.90 | 181 | 2.05 | 184 | 2.20 | 157 | 1.40 | 605 | 2.00 | 1,730 | 2.60 | 3,770 |
| 6 | 1.88 | 163 | 1.97 | 195 | 2.24 | 176 | 1.35 | 545 | 2.00 | 1,730 | 2.69 | 4,130 |
| 7 | 1.95 | 165 | 1.98 | 199 | 2.20 | 207 | 1.31 | 501 | 1.95 | 1,600 | 2.42 | 3,076 |
| 8 | 1.95 | 172 | 1.99 | 200 | 2.24 | 226 | 1.34 | 534 | 1.95 | 1,600 | 2.35 | 2,815 |
| 9 | 1.89 | 178 | 2.02 | 203 | 2.26 | 252 | 1.30 | 490 | 1.98 | 1,678 | 2.29 | 2,600 |
| 10 | 1.97 | 180 | 2.06 | 212 | 2.26 | 283 | 1.28 | 468 | 2.05 | 1,860 | 2.25 | 2,460 |
| 11 | 1.90 | 179 | 2.16 | 205 | 2.28 | 324 | 1.28 | 468 | 2.05 | 1,860 | 2.24 | 2,427 |
| 12 | 1.87 | 178 | 2.18 | 183 | 2.36 | 375 | 1.28 | 468 | 2.08 | 1,938 | 2.24 | 2,427 |
| 13 | 1.87 | 175 | 2.00 | 164 | 2.38 | 420 | 1.28 | 468 | 2.06 | 1,886 | 2.21 | 2,328 |
| 14 | 1.82 | 172 | 2.10 | 178 | 2.36 | 590 | 1.28 | 468 | 2.20 | 2,295 | 2.18 | 2,233 |
| 15 | 1.87 | 167 | 2.15 | 191 | 2.38 | 790 | 1.29 | 479 | 2.23 | 2,394 | 2.31 | 2,671 |
| 16 | 1.87 | 169 | 2.17 | 198 | 2.65 | 1,120 | 1.37 | 569 | 2.30 | 2,635 | 2.38 | 2,926 |
| 17 | 1.82 | 157 | 2.18 | 203 | 2.60*d* | 1,500 | 1.39 | 593 | 2.38 | 2,926 | 2.33 | 2,743 |
| 18 | 1.70 | 150 | 2.17 | 207 | 2.65*b* | 1,970 | 1.45 | 675 | 2.29 | 2,600 | 2.28 | 2,565 |
| 19 | 1.80 | 170 | 2.17 | 208 | 2.65 | 1,970 | 1.48 | 717 | 2.24 | 2,427 | 2.28 | 2,565 |
| 20 | 1.80 | 176 | 2.18 | 202 | 2.65*bc* | 1,980 | 1.55 | 820 | 2.15 | 2,140 | 2.38 | 2,926 |
| 21 | 1.85 | 170 | 2.16 | 190 | 2.10*m* | 1,990 | 1.60 | 900 | 2.12 | 2,050 | 2.28 | 2,565 |
| 22 | 1.82 | 168 | 2.15 | 178 | 1.95 | 1,600 | 1.65 | 990 | 1.95 | 1,600 | 2.23 | 2,394 |
| 23 | 1.82 | 170 | 2.15 | 175 | 2.00 | 1,730 | 1.70 | 1,080 | 1.90 | 1,490 | 2.21 | 2,328 |
| 24 | 1.83 | 180 | 2.14 | 173 | 2.00 | 1,730 | 1.69 | 1,062 | 1.85 | 1,380 | 2.18 | 2,233 |
| 25 | 1.84 | 190 | 2.13 | 171 | 1.95 | 1,600 | 1.69 | 1,062 | 1.85 | 1,380 | 2.15 | 2,140 |
| 26 | 1.88 | 195 | 2.12 | 168 | 1.85 | 1,380 | 1.65 | 990 | 1.85 | 1,380 | 2.59 | 3,730 |
| 27 | 1.89 | 195 | 2.11 | 163 | 1.76 | 1,200 | 1.65 | 990 | 1.82 | 1,320 | 2.58 | 3,690 |
| 28 | 1.87 | 186 | 2.11 | 158 | 1.70 | 1,080 | 1.65 | 990 | 1.80 | 1,280 | 2.48 | 3,304 |
| 29 | 1.88 | 169 | ..... | ..... | 1.60 | 900 | 1.65 | 990 | 1.80 | 1,280 | 2.38 | 2,926 |
| 30 | 1.89 | 167 | ..... | ..... | 1.57 | 852 | 1.60 | 900 | 1.83 | 1,340 | 2.28 | 2,565 |
| 31 | 1.90 | 179 | ..... | ..... | 1.55 | 820 | ..... | ..... | 1.85 | 1,380 | ..... | ..... |

*a* Interpolated.
*b* to *b* Ice down stream from gauge.
*d* Ice gone from gauge.
*s* to *c* Ice conditions, Jan. 1 to March 20 (incl.).
*m* Open water, March 21.

DAILY GAUGE HEIGHT AND DISCHARGE of St. Mary River at Whitney's Ranch, for 1915.
—*Concluded.*

| DAY. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.39 | 2,963 | 2.07 | 1,912 | 1.44 | 756 | 1.34 | 616 | 1.47 | 802 | 1.47 | 550 |
| 2 | 2.30 | 2,635 | 1.97 | 1,652 | 1.43 | 742 | 1.32 | 588 | 1.47 | 802 | 1.48 | 522 |
| 3 | 2.32 | 2,707 | 1.87 | 1,424 | 1.45 | 770 | 1.32 | 588 | 1.47 | 802 | 1.53 | 500 |
| 4 | 2.27 | 2,530 | 1.82 | 1,320 | 1.47 | 802 | 1.34 | 616 | 1.44 | 756 | 1.53 | 480 |
| 5 | 2.23 | 2,394 | 1.77 | 1,220 | 1.77 | 1,330 | 1.34 | 616 | 1.46 | 786 | 1.48 | 455 |
| 6 | 2.15 | 2,140 | 1.76 | 1,200 | 1.97 | 1,764 | 1.51 | 866 | 1.47 | 802 | 1.48 | 425 |
| 7 | 2.15 | 2,140 | 1.73 | 1,140 | 1.72 | 1,230 | 1.67 | 1,136 | 1.48 | 818 | 1.49 | 400 |
| 8 | 2.14 | 2,110 | 1.73 | 1,140 | 1.63 | 1,064 | 1.72 | 1,230 | 1.48 | 818 | 1.49 | 380 |
| 9 | 2.13 | 2,080 | 1.71 | 1,100 | 1.57 | 962 | 1.72 | 1,230 | 1.48 | 818 | 1.48 | 355 |
| 10 | 2.11 | 2,020 | 1.70 | 1,080 | 1.55 | 930 | 1.70 | 1,190 | 1.48 | 818 | 1.47 | 328 |
| 11 | 2.07 | 1,912 | 1.67 | 1,026 | 1.57 | 962 | 1.71 | 1,210 | 1.47 | 802 | 1.45 | 313 |
| 12 | 2.04 | 1,834 | 1.65 | 995*a* | 1.57 | 962 | 1.73 | 1,250 | 1.47 | 802 | 1.48 | 295 |
| 13 | 2.07 | 1,912 | 1.62 | 952 | 1.55 | 930 | 1.73 | 1,250 | 1.46 | 786 | 1.51 | 279 |
| 14 | 1.94 | 1,578 | 1.60 | 925 | 1.55 | 930 | 1.73 | 1,250 | 1.45 | 770 | 1.51 | 266 |
| 15 | 1.91 | 1,512 | 1.60 | 934 | 1.52 | 882 | 1.67 | 1,136 | 1.43 | 742 | 1.53 | 259 |
| 16 | 1.91 | 1,512 | 1.60 | 943 | 1.48 | 818 | 1.67 | 1,136 | 1.43 | 742 | 1.53 | 263 |
| 17 | 1.87 | 1,424 | 1.60 | 952 | 1.46 | 786 | 1.66 | 1,118 | 1.43 | 742 | 1.54 | 274 |
| 18 | 1.90 | 1,490 | 1.60 | 961 | 1.44 | 756 | 1.62 | 1,046 | 1.43 | 742 | 1.54 | 285 |
| 19 | 1.97 | 1,652 | 1.59 | 950 | 1.42 | 728 | 1.62 | 1,046 | 1.44 | 756 | 1.58 | 300 |
| 20 | 1.92 | 1,534 | 1.57 | 928 | 1.47 | 802 | 1.57 | 962 | 1.43 | 742 | 1.68 | 310 |
| 21 | 1.87 | 1,424 | 1.57 | 935 | 1.58 | 978 | 1.52 | 882 | 1.42*c* | 705 | 1.79 | 317 |
| 22 | 1.84 | 1,360 | 1.59 | 975 | 1.55 | 930 | 1.51 | 866 | 1.41 | 685 | 1.79 | 318 |
| 23 | 1.80 | 1,280 | 1.60 | 1,000*b* | 1.53 | 898 | 1.49 | 834 | 1.41 | 678 | 1.80 | 316 |
| 24 | 1.72 | 1,120 | 1.63 | 1,064 | 1.50 | 850 | 1.48 | 818 | 1.40 | 672 | 1.75 | 302 |
| 25 | 1.71 | 1,100 | 1.61 | 1,028 | 1.51 | 866 | 1.47 | 802 | 1.40 | 666 | 1.76 | 288 |
| 26 | 1.73 | 1,140 | 1.57 | 962 | 1.51 | 866 | 1.47 | 802 | 1.40 | 657 | 1.71 | 272 |
| 27 | 1.87 | 1,424 | 1.52 | 882 | 1.48 | 818 | 1.46 | 786 | 1.41 | 647 | 1.62 | 255 |
| 28 | 2.25 | 2,460 | 1.47 | 802 | 1.45 | 770 | 1.46 | 786 | 1.43 | 635 | 1.62 | 238 |
| 29 | 3.07 | 5,724 | 1.44 | 756 | 1.42 | 728 | 1.44 | 756 | 1.44 | 609 | 1.58 | 210 |
| 30 | 2.27 | 2,530 | 1.44 | 756 | 1.37 | 658 | 1.44 | 756 | 1.47 | 580 | 1.60 | 185 |
| 31 | 2.13 | 2,080 | 1.44 | 756 | ..... | ..... | 1.47 | 802 | ..... | ..... | 1.58*d* | 155 |

*a* to *b* Change of stage.
*c* to *d* Ice conditions, Nov. 21 to Dec. 31 (incl.)

MONTHLY DISCHARGE of St. Mary River at Whitney's Ranch, for 1915.

(Drainage area 1,394 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 235 | 150 | 180 | 0.129 | 0.149 | 11,068 |
| February | 212 | 158 | 186 | 0.133 | 0.138 | 10,330 |
| March | 1,990 | 138 | 897 | 0.643 | 0.741 | 55,154 |
| April | 1,080 | 468 | 705 | 0.506 | 0.564 | 41,950 |
| May | 2,926 | 990 | 1,744 | 1.250 | 1.441 | 107,130 |
| June | 5,220 | 1,446 | 2,744 | 1.970 | 2.198 | 163,280 |
| July | 5,724 | 1,100 | 1959 | 1.410 | 1.626 | 120,520 |
| August | 1,912 | 756 | 1054 | 0.756 | 0.872 | 64,581 |
| September | 1,764 | 658 | 909 | 0.652 | 0.727 | 54,089 |
| October | 1,250 | 588 | 934 | 0.670 | 0.772 | 57,429 |
| November | 818 | 580 | 739 | 0.530 | 0.591 | 43,974 |
| December | 550 | 155 | 326 | 0.234 | 0.270 | 20,045 |
| The year | ..... | ..... | ..... | ..... | 10.089 | 749,550 |

## MILK RIVER DRAINAGE BASIN.

*General Description.*

Milk River rises on the eastern slope of the foothills on the Blackfoot Indian Reserve in the United States. Its headwaters run down in two main streams, which are known, after entering Canada, as the north and south branches.

The north branch flows in a northeasterly direction through the Blackfoot Reserve for a distance of about fifteen miles, and then enters Canada near the quarter-mound on the south side of Section 3, Township 1, Range 23, West of the 4th Meridian. From the international boundary the north branch continues in a northeasterly direction for about nine miles, when it bends to the east and runs in an easterly direction through the second tier of township to its junction with the south branch at the centre of Section 20, Township 2, Range 18, West of the 4th Meridian.

The south branch runs to the south and east of, and parallels the north branch for a distance of about forty-eight miles, as the crow flies, through the Blackfoot Reserve, and then enters Canada near the quarter-mound on the south side of Section 1, Township 1, Range 20, West of the 4th Meridian. From the international boundary it flows in a northeasterly direction to its junction with the north branch.

From the confluence of the two branches, Milk River flows in an easterly direction through the second tier of townships in Canada to the east boundary of Range seven. From this point the river flows in a southeasterly direction to its first point of crossing the international boundary into the United States. This first point of crossing is near the quarter-mound on the south side of Section 3, Township 1, Range 5, West of the 4th Meridian. From this point the river meanders in an easterly direction through Canada and the United States, to a point on the international boundary about 900 feet west of the east boundary of Section 1, Township 1, Range 5, West of the 4th Meridian, where it finally crosses into the United States. This point is known as the "Eastern Crossing." The length of the course of the Milk River in Canada from the western crossing of the north branch to the eastern crossing is about 180 miles. The length of the course of the south branch in Canada is fourteen miles.

Throughout its course in Canada, from the western crossing of the north branch to the eastern crossing, Milk River flows through a well defined valley bordered on the east side by a range of hills. The whole of its watershed in Canada is treeless prairie land, the last forty miles of river flat being, however, well wooded. The river receives a number of small tributary creeks along its course, all of which discharge a considerable volume of water during the spring freshets; usually they all dry up about July 1, and have no considerable discharge again until late in the fall, when some of them have a small flow for perhaps a month before the freeze-up.

The general conditions of flow in the river are such as are typical of all rivers which have a watershed devoid of tree growth; that is, it is subject to extreme floods during the freshet period, and to correspondingly low flow during the summer months.

### NORTH BRANCH OF MILK RIVER AT PETERS' RANCH.

*Location.*—NE. ¼ Sec. 11, Tp. 1, Rge. 23, W. 4th Mer.

*Records available.*—July 21, 1909, to December 31, 1915.

*Gauges.*—Stevens automatic gauge used during open water. Vertical staff used during ice conditions. Zero of gauges maintained at elevation 4,110.45 feet during 1913–14–15.

*Bench-mark.*—Permanent iron. Elevation, 4,116.87 feet above mean sea level. (Irrigation surveys 1914 datum.)

*Channel.*—Permanent.

*Discharge measurements.*—Made by wading at low stages and from a cable car two miles below at flood periods.

*Winter flow.*—Obtained through the ice 750 feet below the gauge.

*Observer.*—Wm. Wheeler, Taylorville P.O., Alta.

*Remarks.*—Location of station and gauge datum prior to 1913 may be obtained in previous reports.

DISCHARGE MEASUREMENTS of North Branch of Milk River at Peters' Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq.-ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 1 | O. H. Hoover | 16 | 10.8 | 1.42 | 2.11 | 15.4 |
| Jan. 22 | J. E. Degnan | 16 | 12.0 | 1.36 | 2.27 | 16.3 |
| Feb. 10 | do | 15 | 13.9 | 1.18 | 2.48 | 16.4 |
| Feb. 25 | do | 16 | 14.6 | 1.20 | 1.91 | 17.5 |
| Mar. 16 | do | 41 | 67.0 | 1.67 | 3.23 | 112.0 |
| Mar. 16 | do | 22 | 76.0 | 2.16 | 3.46 | 166.0 |
| Mar. 17 | do | 21 | 63.0 | 1.52 | 2.95 | 96.0 |
| Mar. 26 | do | 19 | 28.3 | 1.35 | 1.95 | 38.0 |
| April 21 | V. A. Newhall | 24 | 20.9 | 1.50 | 1.82 | 32.0 |
| April 25 | W. A. Lamb (U.S.G.S.) | 28 | 18.9 | 1.31 | 1.76 | 25.0 |
| May 7 | V. A. Newhall | 22 | 19.5 | 1.66 | 1.84 | 32.0 |
| May 9 | do | 22 | 17.4 | 1.52 | 1.76 | 26.0 |
| May 27 | W. A. Lamb (U.S.G.S.) | 30 | 18.4 | 1.36 | 1.76 | 25.0 |
| June 16 | V. A. Newhall | 38 | 40.8 | 2.21 | 2.33 | 90.0 |
| June 17 | do | 38 | 38.6 | 2.23 | 2.30 | 86.0 |
| June 17 | do | 38 | 38.4 | 2.15 | 2.24 | 83.0 |
| June 18 | do | 50 | 66.6 | 2.36 | 2.74 | 159.0 |
| July 14 | B. E. Jones (U.S.G.S.) | 30 | 38.0 | 2.11 | 2.26 | 80.0 |
| July 14 | do | 28 | 26.0 | 3.08 | 2.26 | 80.0 |
| July 14 | V. A. Newhall | 21 | 47.9 | 1.72*a* | 2.27 | 83.0 |
| July 14 | do | 21 | 47.5 | 1.72*a* | 2.25 | 82.0 |
| July 15 | do | 21 | 46.0 | 1.63*a* | 2.21 | 75.0 |
| Aug. 4 | do | 22 | 45.9 | 1.52*a* | 2.20 | 70.0 |
| Aug. 9 | W. A. Lamb and J. C. Hoyt (U.S.G.S.) | 35 | 34.0 | 1.79 | 2.13 | 61.0 |
| Aug. 18 | V. A. Newhall | 21 | 42.8 | 1.34*a* | 2.10 | 57.0 |
| Aug. 30 | do | 21 | 40.0 | 1.26*a* | 2.05 | 50.0 |
| Oct. 8 | do | 21 | 50.1 | 1.68*a* | 2.34 | 84.0 |
| Nov. 11 | W. H. Storey | 21 | 46.6 | 0.84 | 2.43*b* | 39.0 |
| Dec. 6 | do | 26 | 54.3 | 1.04 | 2.06 | 56.0 |
| Dec. 7 | do | 26 | 52.1 | 0.85 | 1.97 | 44.0 |
| Dec. 23 | do | 21 | 32.5 | 1.22 | 2.02 | 40.0 |

*a* Cross-section for measuring 300 feet below gauge house.
*b* Ice formed on control, about 0.40 backwater on gauge.

DAILY GAUGE HEIGHT AND DISCHARGE of North Branch of Milk River at Peters' Ranch, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.ft.* |
| 1 | 2.18*a* | 15.5 | 2.58 | 16.8 | 1.90 | 19.1 | 2.29 | 86 | 2.14 | 63 | 1.78 | 26 |
| 2 | 2.20 | 15.6 | 2.50 | 16.8 | 1.93 | 19.2 | 2.94 | 190 | 1.90 | 36 | 1.96 | 42 |
| 3 | 2.20 | 15.8 | 2.37 | 16.8 | 2.03 | 19.3 | 2.27 | 82 | 1.78 | 26 | 2.89 | 181 |
| 4 | 2.10*c* | 16.0 | 2.36 | 16.8 | 2.00 | 19.8 | 2.07 | 54 | 1.75 | 24 | 3.01 | 202 |
| 5 | 1.99 | 15.5 | 2.32 | 16.8 | 1.97 | 21.0 | 2.00 | 46 | 1.83 | 30 | 3.10 | 217 |
| 6 | 1.99 | 14.9 | 2.38 | 16.7 | 1.98 | 21.0 | 1.98 | 44 | 1.80 | 28 | 2.53 | 124 |
| 7 | 1.97 | 14.9 | 2.41 | 16.6 | 2.12 | 21.0 | 1.99 | 45 | 1.84 | 31 | 2.31 | 89 |
| 8 | 1.94*c* | 15.0 | 2.44 | 16.5 | 2.26 | 22.0 | 1.90 | 36 | 1.82 | 29 | 2.31 | 89 |
| 9 | 1.91 | 15.5 | 2.44 | 16.4 | 2.24 | 21.0 | 1.86 | 33 | 1.78 | 26 | 2.22 | 75 |
| 10 | 1.89 | 16.0 | 2.48 | 16.5 | 2.14*c* | 21.0 | 1.86 | 33 | 1.77 | 25 | 3.10 | 217 |
| 11 | 1.88 | 16.4 | 2.35 | 16.5 | 2.03 | 21.0 | 1.86 | 33 | 1.74 | 23 | 2.50 | 119 |
| 12 | 2.13 | 16.5 | 2.21 | 16.7 | 2.18 | 22.0 | 1.91 | 37 | 1.72 | 22 | 2.34 | 93 |
| 13 | 2.15 | 16.2 | 2.02 | 17.0 | 2.26*c* | 36.0 | 1.91 | 37 | 1.88 | 35 | 2.26 | 81 |
| 14 | 2.10 | 15.8 | 2.09 | 17.1 | 2.34 | 60.0 | 1.93 | 39 | 2.23 | 76 | 2.43 | 108 |
| 15 | 2.09 | 15.3 | 2.13 | 17.2 | 2.46 | 85.0 | 1.90 | 36 | 2.30 | 87 | 2.37 | 98 |
| 16 | 2.07 | 15.2 | 2.09 | 17.2 | 3.23*a* | 139.0 | 1.89 | 36 | 2.23 | 76 | 2.36 | 97 |
| 17 | 2.03 | 15.6 | 2.15 | 17.2 | 2.87*b* | 178.0 | 1.87 | 34 | 2.28 | 84 | 2.40 | 103 |
| 18 | 2.40 | 15.8 | 2.11 | 17.2 | 2.81 | 169.0 | 1.85 | 32 | 2.07 | 54 | 2.71 | 153 |
| 19 | 2.43 | 16.0 | 2.02 | 17.5 | 2.61 | 137.0 | 1.83 | 30 | 1.98 | 44 | 2.50 | 119 |
| 20 | 2.44*c* | 16.2 | 1.98 | 17.6 | 2.53 | 124.0 | 1.81 | 28 | 1.90 | 36 | 2.31 | 89 |
| 21 | 2.45*c* | 16.3 | 1.97 | 17.8 | 2.50 | 119.0 | 1.81 | 28 | 1.85 | 32 | 2.22 | 75 |
| 22 | 2.46 | 16.4 | 1.98*c* | 17.8 | 2.48 | 116.0 | 1.80 | 28 | 1.83 | 30 | 2.20 | 72 |
| 23 | 2.32 | 16.2 | 1.99 | 17.7 | 2.40 | 103.0 | 1.79 | 27 | 1.82 | 29 | 2.20 | 72 |
| 24 | 2.44 | 16.1 | 1.95*c* | 17.5 | 2.31 | 89.0 | 1.76 | 25 | 1.81 | 28 | 2.18 | 69 |
| 25 | 2.52 | 15.9 | 1.91 | 17.5 | 2.29 | 86.0 | 1.75 | 24 | 1.80 | 28 | 3.14 | 224 |
| 26 | 2.51 | 15.8 | 1.88 | 17.6 | 2.10 | 58.0 | 1.71 | 21 | 1.78 | 26 | 3.18 | 231 |
| 27 | 2.51 | 15.7 | 1.89 | 18.1 | 2.09 | 57.0 | 1.70 | 20 | 1.79 | 27 | 2.86 | 178 |
| 28 | 2.50 | 15.8 | 1.88 | 18.8 | 2.09 | 57.0 | 1.68 | 19 | 1.77 | 25 | 2.64 | 141 |
| 29 | 2.51 | 16.0 | ..... | ..... | 2.09 | 57.0 | 1.65 | 17 | 1.78 | 26 | 2.40 | 103 |
| 30 | 2.56 | 16.5 | ..... | ..... | 2.07 | 54.0 | 1.72 | 22 | 1.78 | 26 | 2.41*b* | 105 |
| 31 | 2.60 | 16.8 | ..... | ..... | 2.00 | 46.0 | ..... | ..... | 1.78 | 26 | ..... | ..... |

*a* to *a* Ice conditions.
*b* to *b* Open water conditions, automatic gauge heights.
*c* Estimated gauge height.

DAILY GAUGE HEIGHT AND DISCHARGE of North Branch of Milk River at Peters' Ranch, for 1915. —*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.58*ab* | 132 | 2.48 | 116 | 2.02 | 48 | 2.11 | 59 | 2.15 | 65 | 2.10 | 36 |
| 2 | 2.46 | 113 | 2.36 | 97 | 2.48 | 116 | 2.11 | 59 | 2.15 | 65 | 2.04 | 46 |
| 3 | 2.47 | 114 | 2.25 | 80 | 3.57 | 297 | 2.31 | 89 | 2.15 | 65 | 2.07 | 51 |
| 4 | 2.38 | 100 | 2.20 | 72 | 2.40 | 103 | 2.32 | 90 | 2.16 | 66 | 2.10 | 54 |
| 5 | 2.35 | 95 | 2.18 | 68 | 2.20 | 72 | 2.29 | 86 | 2.16 | 66 | 2.11 | 58 |
| 6 | 2.41 | 105 | 2.15 | 64 | 2.11 | 59 | 2.29 | 86 | 2.17 | 67 | 2.06 | 56 |
| 7 | 2.45 | 111 | 2.12 | 61 | 2.09 | 57 | 2.31 | 89 | 2.16 | 66 | 1.97 | 43 |
| 8 | 2.37 | 98 | 2.11 | 59 | 2.09 | 57 | 2.33 | 92 | 2.15 | 65 | 1.99 | 43 |
| 9 | 2.34 | 93 | 2.13 | 62 | 2.20 | 72 | 2.24 | 78 | 2.16 | 66 | 2.02 | 40 |
| 10 | 2.39 | 101 | 2.10 | 58 | 2.34 | 93 | 2.22 | 75 | 2.10*a* | 58 | 2.00 | 36 |
| 11 | 2.31 | 89 | 2.09 | 57 | 2.25 | 80 | 2.25 | 80 | 2.25*c* | 39 | 2.10 | 36 |
| 12 | 2.30 | 87 | 2.09 | 57 | 2.30 | 87 | 2.30 | 87 | 2.12 | 38 | 2.03 | 35 |
| 13 | 2.29 | 86 | 2.10 | 58 | 2.28 | 84 | 2.26 | 81 | 2.10 | 37 | 1.98 | 35 |
| 14 | 2.27 | 82 | 2.10 | 58 | 2.27 | 82 | 2.25 | 80 | 2.14 | 46 | 2.00 | 35 |
| 15 | 2.21 | 74 | 2.10 | 58 | 2.16 | 66 | 2.30 | 87 | 2.15 | 48 | 2.00 | 34 |
| 16 | 2.21 | 74 | 2.09 | 57 | 2.11 | 59 | 2.23 | 76 | 2.11 | 58 | 1.97 | 33 |
| 17 | 2.64 | 141 | 2.08 | 56 | 2.10 | 58 | 2.19 | 71 | 2.15 | 50 | 1.98 | 35 |
| 18 | 2.94 | 190 | 2.08 | 56 | 2.10 | 58 | 2.16 | 67 | 2.14 | 56 | 2.12 | 38 |
| 19 | 2.40 | 103 | 2.35 | 95 | 2.15 | 65 | 2.15 | 65 | 2.10 | 58 | 2.17*b* | 36 |
| 20 | 2.29 | 86 | 2.55 | 127 | 2.20 | 72 | 2.15 | 65 | 2.15 | 36 | ..... | 36 |
| 21 | 2.22 | 75 | 2.28 | 84 | 2.16 | 66 | 2.15 | 65 | 2.13 | 34 | ..... | 36 |
| 22 | 2.19 | 70 | 2.20 | 72 | 2.13 | 62 | 2.15 | 65 | 2.11 | 32 | ..... | 38 |
| 23 | 2.20 | 72 | 2.16 | 66 | 2.13 | 62 | 2.15 | 65 | 2.10 | 54 | ..... | 40 |
| 24 | 2.36 | 97 | 2.14 | 63 | 2.24 | 78 | 2.14 | 64 | 2.11 | 50 | ..... | 40 |
| 25 | 2.29 | 86 | 2.12 | 61 | 2.18 | 69 | 2.14 | 64 | 2.09 | 35 | ..... | 40 |
| 26 | 2.40 | 103 | 2.11 | 59 | 2.17 | 67 | 2.14 | 64 | 2.17 | 46 | ..... | 40 |
| 27 | 2.38 | 100 | 2.10 | 58 | 2.15 | 65 | 2.15 | 65 | 2.12 | 46 | ..... | 40 |
| 28 | 2.57 | 130 | 2.09 | 57 | 2.15 | 65 | 2.15 | 65 | 2.28 | 46 | ..... | 39 |
| 29 | 2.65 | 143 | 2.08 | 56 | 2.17 | 67 | 2.15 | 65 | 2.25 | 42 | ..... | 38 |
| 30 | 2.50 | 119 | 2.06 | 53 | 2.15 | 65 | 2.16 | 66 | 2.13 | 39 | ..... | 36 |
| 31 | 2.32 | 90 | 2.03 | 50 | ..... | ..... | 2.15 | 65 | ..... | ..... | ..... | 35*c* |

*a* to *a* Open water conditions.
*b* to *b* Automatic gauge records.
*c* to *c* Ice conditions.

MONTHLY DISCHARGE of North Branch of Milk River at Peters' Ranch, for 1915.

(Drainage area 101 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 16.8 | 14.9 | 15.8 | 0.156 | 0.18 | 972 |
| February | 18.8 | 16.4 | 17.2 | 0.170 | 0.18 | 955 |
| March | 178.0 | 19.1 | 65.0 | 0.644 | 0.74 | 3,997 |
| April | 190.0 | 17.0 | 41.0 | 0.406 | 0.45 | 2,440 |
| May | 87.0 | 22.0 | 37.0 | 0.366 | 0.42 | 2,275 |
| June | 231.0 | 26.0 | 120.0 | 1.190 | 1.33 | 7,140 |
| July | 190.0 | 70.0 | 102.0 | 1.010 | 1.15 | 6,272 |
| August | 127.0 | 50.0 | 68.0 | 0.673 | 0.78 | 4,181 |
| September | 297.0 | 48.0 | 78.0 | 0.772 | 0.86 | 4,641 |
| October | 92.0 | 59.0 | 73.0 | 0.722 | 0.83 | 4,489 |
| November | 67.0 | 32.0 | 51.0 | 0.505 | 0.56 | 3,035 |
| December | 58.0 | 33.0 | 40.0 | 0.396 | 0.46 | 2,460 |
| The year | ..... | ..... | ..... | ..... | 7.94 | 42,857 |

NORTH BRANCH OF MILK RIVER NEAR MACKIE'S RANCH.

*Location.*—SW. ¼ Sec. 19, Tp. 2, Rge. 18, W. 4th Mer., about four miles north of the Mackie ranch buildings.

*Records available.*—July 8, 1909, to November 14, 1910. Discharge measurements only were taken during 1911–1915.

*Gauge.*—Vertical staff. Zero maintained at elevation, 91.50 feet, since establishment.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Sand, gravel and rock; control probably permanent.

*Discharge measurements.*—During low water by wading, and high water from a cable car.

DISCHARGE MEASUREMENTS of North Branch of Milk River near Mackie's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq.-ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 7 | W. H. Storey | 64 | 87.0 | 1.17 | 2.18 | 102 |
| April 28 | do | 23 | 16.2 | 2.10 | 1.74 | 34 |
| May 25 | G. H. Whyte and W. H. Storey | 25 | 20.4 | 2.26 | 1.88 | 46 |
| June 21 | W. H. Storey | 65 | 90.0 | 1.49 | 2.44 | 134 |
| July 18 | do | 66 | 98.2 | 1.54 | 2.52 | 151 |
| Aug. 4 | do | 65 | 85.5 | 1.25 | 2.33 | 110 |
| Aug. 24 | do | 64 | 71.1 | 1.02 | 2.11 | 72 |
| Sept. 9 | do | 65 | 77.0 | 1.12 | 2.17 | 86 |
| Sept. 29 | do | 65 | 77.5 | 1.12 | 2.18 | 87 |
| Oct. 17 | do | 65 | 84.5 | 1.15 | 2.25 | 97 |

SOUTH BRANCH OF MILK RIVER AT CROFF'S RANCH.

*Location.*—On the SW. ¼ Sec. 29, Tp. 37 N, Rge. 9, West Prin. Meridian, Montana, U.S.A.

*Records available.*—April 13, 1913, December 31, 1915.

*Gauge.*—Stevens continuous automatic. Elevation of zero maintained at 87.08 feet since establishment.

*Bench-mark.*—Iron pipe. Assumed elevation, 100.00 feet.

*Channel.*—Gravel.

*Discharge measurements.*—During high stages by means of cable and car; during ordinary stages by wading.

*Remarks.*—This station is maintained in conjunction with the United States Geological Survey.

DISCHARGE MEASUREMENTS of South Branch of Milk River at Croff's Ranch, Montana, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq.-ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Feb. 9 | J. E. Degnan | 20 | 11.8 | 1.44 | 2.47 | 17.0*a* |
| Feb. 20 | W. A. Lamb (U.S.G.S.) | 19 | 12.4 | 1.60 | 2.50 | 19.9*a* |
| Mar. 17 | J. E. Degnan | 73 | 82.0 | 2.85 | 3.72 | 236.0 |
| Mar. 27 | do | 38 | 20.0 | 1.64 | 2.68 | 33.0 |
| April 22 | V. A. Newhall | 47 | 32.0 | 1.89 | 2.91 | 60.0 |
| April 25 | W. A. Lamb (U.S.G.S.) | 42 | 25.0 | 2.12 | 2.80 | 53.0 |
| May 7 | V. A. Newhall | 56 | 47.0 | 2.04 | 3.12 | 96.0 |
| May 27 | W. A. Lamb (U.S.G.S.) | 44 | 30.0 | 2.27 | 2.92 | 68.0 |
| June 17 | V. A. Newhall | 75 | 76.0 | 2.37 | 3.50 | 181.0 |
| July 13 | B. E. Jones (U.S.G.S.) | 49 | 51.0 | 1.12 | 2.96 | 57.0 |
| July 14 | do | 34 | 45.0 | 1.31 | 2.99 | 59.0 |
| July 14 | V. A. Newhall | 76 | 48.0 | 1.38 | 3.00 | 66.0 |
| Aug. 5 | do | 59 | 36.0 | 1.72 | 3.05 | 61.0 |
| Aug. 8 | J. C. Hoyt and W. A. Lamb (U.S.G.S.) | 52 | 46.0 | 0.93 | 2.89 | 43.0 |
| Aug. 18 | V. A. Newhall | 56 | 30.0 | 1.51 | 2.90 | 47.0 |
| Aug. 31 | do | 52 | 22.0 | 1.27 | 2.76 | 29.0 |
| Sept. 15 | W. A. Lamb (U.S.G.S.) | 75 | 62.0 | 1.87 | 3.36 | 116.0 |
| Oct. 8 | V. A. Newhall | 74 | 62.0 | 1.67 | 3.31 | 104.0 |
| Nov. 11 | W. H. Storey | 76 | 43.0 | 1.48 | 3.09 | 64.0*a* |
| Nov. 27 | W. A. Lamb (U.S.G.S.) | 46 | 41.0 | 1.27 | 2.91 | 52.0*a* |
| Dec. 7 | W. H. Storey | 56 | 32.0 | 1.90 | 2.93 | 59.0*a* |

*a* Ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of South Branch of Milk River at Croff's Ranch, Montana, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge | Gauge Height. | Discharge | Gauge Height | Discharge | Gauge Height. | Discharge | Gauge Height | Discharge | Gauge Height | Discharge |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.40 | 9 | 2.45 | 12.0 | 2.50 | 20 | 3.07 | 96 | 3.34 | 147 | ..... | 50*a* |
| 2 | ..... | 9*a* | ..... | 12.0*a* | 2.49 | 19 | 3.81 | 258 | 3.71 | 232 | ..... | 100*a* |
| 3 | ..... | 14*a* | ..... | 12.0*a* | 2.49 | 19 | 4.07 | 335 | 3.65 | 216 | 4.65 | 534 |
| 4 | 2.47 | 14 | ..... | 12.0*a* | 2.49 | 19 | 3.40 | 159 | 3.31 | 147 | 5.39 | 804 |
| 5 | 2.48 | 15 | ..... | 13.0*a* | 2.48 | 19 | 3.16 | 112 | 3.25 | 130 | 5.45 | 826 |
| 6 | 2.48 | 15 | ..... | 13.0*a* | 2.41 | 15 | 3.09 | 99 | 3.25 | 130 | 4.17 | 368 |
| 7 | ..... | 15*a* | ..... | 13.0*a* | 2.43 | 16 | 3.02 | 87 | 3.14 | 109 | 3.77 | 247 |
| 8 | ..... | 15*a* | 2.39 | 13.0 | 2.41 | 16 | 3.05 | 92 | 3.05 | 92 | 3.70 | 229 |
| 9 | ..... | 14*a* | 2.44 | 16.0 | 2.47 | 18 | 2.93 | 71 | 2.99 | 81 | 3.70 | 229 |
| 10 | ..... | 14*a* | 2.37 | 12.0 | 2.44 | 16 | 2.89 | 64 | 2.95 | 74 | ..... | 300*a* |
| 11 | 2.47 | 14 | 2.39 | 13.0 | 2.38 | 13 | 2.88 | 63 | 2.90 | 66 | ..... | 200*a* |
| 12 | 2.48 | 15 | 2.36 | 12.0 | 2.40 | 14 | 2.90 | 66 | 2.90 | 66 | ..... | 175*a* |
| 13 | ..... | 15*a* | 2.34 | 10.4 | 2.40 | 14 | 2.91 | 68 | 2.95 | 74 | ..... | 150*a* |
| 14 | ..... | 14*a* | 2.34 | 10.4 | 2.42 | 15 | 2.95 | 74 | 3.53 | 188 | 3.28 | 135 |
| 15 | ..... | 14*a* | 2.36 | 12.0 | 2.46 | 18 | 2.93 | 71 | 3.83 | 263 | 3.46 | 172 |
| 16 | ..... | 13*a* | 2.38 | 13.0 | 2.94 | 73 | 2.92 | 69 | 3.70 | 229 | 3.54 | 190 |
| 17 | ..... | 13*a* | 2.42 | 15.0 | 3.48 | 177 | 2.82 | 53 | 3.63 | 212 | 3.46 | 172 |
| 18 | ..... | 12*a* | 2.44 | 16.0 | 3.73 | 237 | ..... | 53*a* | 3.44 | 168 | 3.51 | 183 |
| 19 | ..... | 12*a* | 2.44 | 16.0 | 3.63 | 212 | ..... | 56*a* | 3.47 | 174 | 3.69 | 226 |
| 20 | ..... | 12*a* | 2.50 | 20.0 | 3.50 | 181 | ..... | 60*a* | 3.35 | 149 | 3.51 | 183 |
| 21 | ..... | 11*a* | 2.50 | 20.0 | 3.54 | 190 | ..... | 63*a* | 3.23 | 126 | 3.35 | 147 |
| 22 | ..... | 11*a* | 2.50 | 20.0 | 3.61 | 206 | 2.88 | 63 | 3.14 | 109 | 3.28 | 133 |
| 23 | ..... | 10*a* | 2.50 | 20.0 | ..... | 172*a* | 2.84 | 56 | 3.08 | 97 | 3.29 | 133 |
| 24 | ..... | 10*a* | 2.50 | 20.0 | ..... | 138*a* | 2.81 | 52 | 3.03 | 88 | 3.24 | 122 |
| 25 | ..... | 9*a* | 2.50 | 20.0 | ..... | 103*a* | 2.80 | 50 | 3.04 | 90 | 3.83 | 255 |
| 26 | 2.40 | 9 | 2.50 | 20.0 | ..... | 69*a* | 2.80 | 50 | 3.02 | 87 | 4.94 | 624 |
| 27 | ..... | 9*a* | 2.50 | 20.0 | 2.68 | 34 | 2.80 | 50 | 2.93 | 71 | 4.06 | 316 |
| 28 | ..... | 10*a* | 2.50 | 20.0 | 2.91 | 68 | 2.78 | 47 | 2.91 | 68 | 4.09 | 323 |
| 29 | ..... | 10*a* | ..... | ..... | 2.84 | 56 | 2.75 | 43 | 2.92 | 69 | 3.84 | 247 |
| 30 | ..... | 11*a* | ..... | ..... | 2.81 | 52 | 2.81 | 52 | 2.91 | 68 | ..... | 140*a* |
| 31 | ..... | 12*a* | ..... | ..... | 2.86 | 60 | ..... | ..... | ..... | 55*a* | ..... | ..... |

*a* No gauge heights available; discharges given are estimates based on records at Mackie's and Peters' Ranches.

DAILY GAUGE HEIGHT AND DISCHARGE of South Branch of Milk River at Croff's Ranch, Montana, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | 160*a* | ..... | 160*a* | 2.75 | 29 | 3.04 | 67 | 2.99 | 60 | 2.90 | 52 |
| 2 | ..... | 150*a* | ..... | 120*a* | 2.93 | 51 | 3.05 | 68 | ..... | 62*a* | 2.90 | 52 |
| 3 | ..... | 200*a* | ..... | 100*a* | 4.29 | 367 | 3.18 | 88 | 3.02 | 64 | 2.90 | 52 |
| 4 | ..... | 170*a* | ..... | 80*a* | 4.35 | 388 | 3.24 | 97 | 3.03 | 66 | ..... | 57*a* |
| 5 | ..... | 140*a* | 3.02 | 64 | 3.48 | 140 | 3.25 | 99 | ..... | 66*a* | ..... | 62*a* |
| 6 | ..... | 160*a* | 2.98 | 58 | 3.28 | 104 | 3.22 | 94 | 3.04 | 67 | 3.00 | 67 |
| 7 | ..... | 140*a* | 2.92 | 50 | 3.12 | 79 | 3.28 | 104 | 2.93 | 51 | 2.90 | 52 |
| 8 | ..... | 110*a* | 2.90 | 47 | 3.06 | 70 | 3.26 | 101 | 2.84 | 39 | 2.95 | 60 |
| 9 | ..... | 90*a* | 2.91 | 48 | 3.11 | 78 | 3.24 | 97 | 2.86 | 42 | 2.95 | 60 |
| 10 | ..... | 85*a* | 2.92 | 50 | 3.64 | 177 | 3.26 | 101 | 2.92 | 50 | 2.90 | 52 |
| 11 | ..... | 75*a* | 2.99 | 60 | 3.56 | 158 | 3.20 | 91 | 2.97 | 64 | 2.90 | 52 |
| 12 | ..... | 65*a* | 2.87 | 43 | 3.64 | 177 | 3.23 | 96 | 3.18 | 63 | 2.90 | 52 |
| 13 | 2.96 | 55 | 2.90 | 47 | 3.52 | 149 | 3.20 | 91 | ..... | 62*a* | 2.90 | 52 |
| 14 | 2.98 | 58 | 2.94 | 53 | 3.50 | 144 | 3.19 | 90 | ..... | 61*a* | 2.90 | 52 |
| 15 | 3.00 | 61 | 2.97 | 57 | 3.38 | 121 | 3.27 | 102 | ..... | 60*a* | 2.90 | 52 |
| 16 | 3.00 | 61 | 2.96 | 55 | 3.32 | 110 | 3.24 | 97 | ..... | 60*a* | 2.80 | 39 |
| 17 | 3.08 | 73 | 2.98 | 58 | 3.22 | 94 | 3.18 | 88 | ..... | 59*a* | 2.80 | 39 |
| 18 | 4.21 | 339 | 2.90 | 47 | 3.18 | 88 | 3.13 | 80 | ..... | 58*a* | 2.70 | 28 |
| 19 | 3.82 | 223 | 2.92 | 50 | 3.19 | 90 | 3.06 | 70 | ..... | 57*a* | 2.70 | 28 |
| 20 | 3.66 | 182 | 2.98 | 58 | 3.24 | 97 | 3.00 | 61 | ..... | 56*a* | 2.75 | 34 |
| 21 | 3.66 | 182 | 3.08 | 73 | 3.20 | 91 | 3.06 | 70 | ..... | 55*a* | 2.70 | 28 |
| 22 | 3.66 | 182 | 3.26 | 101 | 3.14 | 82 | 3.06 | 70 | ..... | 55*a* | 2.75 | 34 |
| 23 | 3.67 | 184 | 3.09 | 74 | 3.10 | 76 | 3.02 | 64 | ..... | 54*a* | 2.75 | 34 |
| 24 | 3.69 | 190 | 3.01 | 62 | 3.15 | 84 | 3.02 | 64 | ..... | 53*a* | 2.75 | 34 |
| 25 | 3.71 | 195 | 2.99 | 60 | 3.22 | 94 | 3.00 | 61 | ..... | 52*a* | 2.80 | 39 |
| 26 | 3.75 | 205 | 2.96 | 55 | 3.14 | 82 | 3.00 | 61 | ..... | 52*a* | 2.75 | 34 |
| 27 | 3.78 | 213 | 2.96 | 55 | 3.15 | 84 | 2.99 | 60 | 2.90 | 52 | 2.75 | 34 |
| 28 | ..... | 235*a* | 2.94 | 53 | 3.16 | 85 | 3.06 | 70 | 2.90 | 52 | 2.70 | 28 |
| 29 | ..... | 235*a* | 2.90 | 47 | 3.16 | 85 | 3.04 | 67 | 3.00 | 52 | 2.70 | 28 |
| 30 | ..... | 175*a* | 2.80 | 34 | 3.12 | 79 | 3.00 | 61 | 2.90 | 52 | ..... | 28*a* |
| 31 | ..... | 125*a* | 2.76 | 30 | ..... | ..... | 3.00 | 61 | ..... | ..... | ..... | 28*a* |

*a* No gauge heights available; discharges given are estimates based on records at Mackie's and Peters' Ranches.

MONTHLY DISCHARGE of South Branch of Milk River at Croff's Ranch, Montana, for 1915.

(Drainage area 288 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 15 | 9.0 | 12.3 | 0.043 | 0.05 | 756 |
| February | 20 | 10.4 | 15.2 | 0.053 | 0.06 | 844 |
| March | 237 | 13.0 | 73.5 | 0.255 | 0.29 | 4,520 |
| April | 335 | 43.0 | 84.4 | 0.293 | 0.33 | 5,020 |
| May | 263 | 55.0 | 125.0 | 0.434 | 0.50 | 7,690 |
| June | 826 | 50.0 | 264.0 | 0.917 | 1.02 | 15,700 |
| July | 339 | 55.0 | 152.0 | 0.528 | 0.61 | 9,350 |
| August | 160 | 30.0 | 62.9 | 0.218 | 0.25 | 3,870 |
| September | 388 | 29.0 | 118.0 | 0.410 | 0.46 | 7,020 |
| October | 104 | 60.0 | 80.4 | 0.279 | 0.32 | 4,940 |
| November | 67 | 39.0 | 56.5 | 0.196 | 0.22 | 3,360 |
| December | 67 | 28.0 | 43.3 | 0.150 | 0.17 | 2,660 |
| The year | ..... | ..... | ..... | ..... | 4.28 | 65,730 |

SOUTH BRANCH OF MILK RIVER AT MACKIE'S RANCH.

*Location.*—On the NW. ¼ Sec. 31, Tp. 1, Rge. 18, W. 4th Mer.
*Records available.*—July 14, 1909, to October 31, 1915.
*Gauge.*—Vertical staff. Maintained at elevation of 86.60 feet since establishment.
*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.
*Channel.*—Permanent.

*Discharge measurements.*—Made by wading 100 feet below the gauge, or from a cable and car at the gauge during high stages. The initial point for sounding is the face of a cedar post located on left bank.

*Floods.*—Highest water of recent years was in June, 1908.

*Winter flow.*—Station not maintained during the winter.

*Observer.*—Mrs. Nelson.

DISCHARGE MEASUREMENTS of South Branch of Milk River at Mackie's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq.-ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 6 | W. H. Storey | 85.0 | 115.0 | 1.36 | 2.88 | 156 |
| April 27 | do | 54.0 | 65.8 | 0.83 | 2.37 | 54 |
| May 25 | G. H. Whyte and W. H. Storey | 64.0 | 82.2 | 1.15 | 2.65 | 95 |
| June 21 | W. H. Storey | 84.0 | 111.8 | 1.41 | 2.93 | 157 |
| July 18 | do | 64.0 | 75.8 | 1.03 | 2.56 | 78 |
| Aug. 4 | do | 82.5 | 90.4 | 1.24 | 2.70 | 112 |
| Aug. 23 | do | 73.0 | 81.0 | 0.93 | 2.58 | 76 |
| Sept. 9 | do | 72.0 | 75.6 | 0.91 | 2.52 | 69 |
| Sept. 29 | do | 81.0 | 92.6 | 0.91 | 2.61 | 84 |
| Oct. 18 | do | 82.0 | 103.2 | 0.95 | 2.69 | 98 |

DAILY GAUGE HEIGHT AND DISCHARGE of South Branch of Milk River at Mackie's Ranch, for 1915.

| Day. | April. | | May. | | June. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.44 | 60 | 2.29 | 42 | 2.38 | 53 |
| 2 | 2.51 | 70 | 3.26 | 252 | 2.41 | 56 |
| 3 | 2.70 | 103 | 3.12 | 212 | 2.44 | 60 |
| 4 | 2.79 | 124 | 3.13 | 214 | 4.44 | 662 |
| 5 | 2.39 | 54 | 2.80 | 126 | 4.28 | 603 |
| 6 | 2.42 | 58 | 2.75 | 115 | 4.00 | 499 |
| 7 | 2.56*a* | 78 | 2.73 | 110 | 3.46 | 313 |
| 8 | 2.70 | 103 | 2.71 | 105 | 3.15 | 220 |
| 9 | 2.69 | 101 | 2.62 | 88 | 3.06 | 195 |
| 10 | 2.67 | 97 | 2.59 | 82 | 3.05 | 192 |
| 11 | 2.55 | 76 | 2.51 | 70 | 3.23 | 244 |
| 12 | 2.51 | 70 | 2.49 | 67 | 3.04 | 189 |
| 13 | 2.53 | 73 | 2.61 | 86 | 2.90 | 151 |
| 14 | 2.53 | 73 | 2.62 | 88 | 2.88 | 146 |
| 15 | 2.59 | 82 | 3.31 | 267 | 2.97 | 170 |
| 16 | 2.61 | 86 | 3.38 | 288 | 3.05 | 192 |
| 17 | 2.59 | 82 | 3.19 | 232 | 3.20 | 235 |
| 18 | 2.56 | 78 | 3.17 | 226 | 3.04 | 189 |
| 19 | 2.55 | 76 | 3.03 | 186 | 3.01 | 181 |
| 20 | 2.51 | 70 | 2.99 | 175 | 2.97 | 170 |
| 21 | 2.51 | 70 | 2.88 | 146 | 2.93 | 159 |
| 22 | 2.49 | 67 | 2.82 | 131 | 2.90 | 151 |
| 23 | 2.48 | 65 | 2.73 | 110 | 2.79 | 124 |
| 24 | 2.46 | 63 | 2.71 | 105 | 2.85 | 138 |
| 25 | 2.42 | 58 | 2.65 | 94 | 2.79 | 124 |
| 26 | 2.40 | 55 | 2.60 | 84 | 4.97 | 858 |
| 27 | 2.37 | 51 | 2.58 | 81 | 3.88 | 455 |
| 28 | 2.36 | 50 | 2.53 | 73 | 3.70 | 390 |
| 29 | 2.33 | 47 | 2.48 | 65 | 3.10 | 206 |
| 30 | 2.27 | 40 | 2.41 | 56 | 2.90 | 151 |
| 31 | ... | ... | 2.43 | 59 | ... | ... |

*a* Gauge height interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of South Branch of Milk River at Mackie's Ranch, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.80 | 126 | 2.76 | 117 | 2.17 | 31 | 2.59 | 82 |
| 2 | 2.97 | 170 | 2.96 | 167 | 2.35 | 49 | 2.54 | 74 |
| 3 | 2.95 | 165 | 2.82 | 131 | 2.98 | 173 | 2.55 | 76 |
| 4 | 3.15 | 220 | 2.70 | 103 | 3.90 | 462 | 2.65 | 94 |
| 5 | 2.97 | 170 | 2.58 | 81 | 3.72 | 397 | 2.74 | 112 |
| 6 | 2.84 | 136 | 2.46 | 63 | 2.89 | 148 | 2.72 | 108 |
| 7 | 3.05 | 192 | 2.38 | 53 | 2.67 | 97 | 2.70 | 103 |
| 8 | 2.80 | 126 | 2.34 | 48 | 2.64 | 92 | 2.77 | 119 |
| 9 | 2.65 | 94 | 2.29 | 42 | 2.52 | 71 | 2.77 | 119 |
| 10 | 2.61 | 86 | 2.25 | 38 | 2.63 | 90 | 2.80 | 126 |
| 11 | 2.63 | 90 | 2.45 | 61 | 3.10 | 206 | 2.69 | 101 |
| 12 | 2.59 | 82 | 2.37 | 51 | 2.95 | 165 | 2.77 | 119 |
| 13 | 2.50 | 68 | 2.33 | 47 | 3.01 | 181 | 2.76 | 117 |
| 14 | 2.49 | 67 | 2.29 | 42 | 2.98 | 173 | 2.74 | 112 |
| 15 | 2.50 | 68 | 2.28 | 41 | 2.90 | 151 | 2.69 | 101 |
| 16 | 2.54 | 74 | 2.34 | 48 | 2.82 | 131 | 2.69 | 101 |
| 17 | 2.52 | 71 | 2.34 | 48 | 2.79 | 124 | 2.72 | 108 |
| 18 | 2.56 | 78 | 2.32 | 45 | 2.67 | 97 | 2.69 | 101 |
| 19 | 3.66 | 377 | 2.33 | 47 | 2.62 | 88 | 2.62 | 88 |
| 20 | 2.95 | 165 | 2.45 | 61 | 2.64 | 92 | 2.56 | 78 |
| 21 | 2.76 | 117 | 2.42 | 58 | 2.66 | 95 | 2.56 | 78 |
| 22 | 2.62 | 88 | 2.35 | 49 | 2.65 | 94 | 2.56 | 78 |
| 23 | 2.58 | 81 | 2.58 | 81 | 2.59 | 82 | 2.56 | 78 |
| 24 | 2.55 | 76 | 2.53 | 73 | 2.59 | 82 | 2.56 | 78 |
| 25 | 2.46 | 63 | 2.48 | 65 | 2.58 | 81 | 2.56 | 78 |
| 26 | 2.66 | 95 | 2.35 | 49 | 2.67 | 97 | 2.56 | 78 |
| 27 | 3.20 | 235 | 2.32 | 45 | 2.65 | 94 | 2.56 | 78 |
| 28 | 3.29 | 261 | 2.25 | 38 | 2.58 | 81 | 2.55 | 76 |
| 29 | 3.27 | 255 | 2.24 | 37 | 2.60 | 84 | 2.55 | 76 |
| 30 | 3.22 | 241 | 2.20 | 33 | 2.61 | 86 | 2.54 | 74 |
| 31 | 2.95 | 165 | 2.18 | 31 | ..... | ..... | 2.54 | 74 |

MONTHLY DISCHARGE of South Branch of Milk River at Mackie's Ranch, for 1915.

(Drainage area 504 square miles.)

| Month | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| April | 124 | 40 | 73 | 0.145 | 0.16 | 4,344 |
| May | 288 | 42 | 130 | 0.258 | 0.30 | 7,993 |
| June | 858 | 53 | 249 | 0.494 | 0.55 | 14,817 |
| July | 377 | 63 | 139 | 0.276 | 0.32 | 8,547 |
| August | 167 | 31 | 61 | 0.121 | 0.14 | 3,751 |
| September | 462 | 31 | 130 | 0.258 | 0.29 | 7,736 |
| October | 126 | 74 | 93 | 0.185 | 0.21 | 5,718 |
| The period | ..... | ..... | ..... | ..... | 1.97 | 52,906 |

MILK RIVER AT MILK RIVER.

*Location.*—On the NE. ¼ Sec. 21, Tp. 2, Rge. 16, W. 4th Mer.

*Records available.*—July 1, 1909, to December 31, 1915.

*Gauge.*—Vertical staff, maintained at the original elevation of 3,403.39 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark. Elevation 3,412.42 feet above mean sea level. (Geodetic Survey of Canada.)

*Channel.*—The stream flows in one channel at all stages; bed consists of sand and fine gravel, and shifts during flood conditions.

*Discharge measurements.*—At low stages made by wading; at high stages from the traffic bridge 100 feet above the gauge.

*Observer.*—Dan. O'Connell.

DISCHARGE MEASUREMENTS of Milk River at Milk River, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean. Velocity. | Gauge Height. | Dis-charge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq.-ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 11 | O. H. Hoover | 93.0 | 59.3 | 0.48 | 2.25 | 29 |
| Jan. 25 | J. E. Degnan | 49.0 | 34.6 | 0.64 | 2.33 | 22 |
| Feb. 11 | do | 48.5 | 37.0 | 0.66 | 2.80 | 24 |
| Mar. 2 | do | 52.0 | 42.5 | 0.71 | 3.07 | 30 |
| Mar. 10 | do | 59.0 | 41.3 | 1.01 | 2.89 | 42 |
| Mar. 15 | W. H. Storey | 57.0 | 39.1 | 1.18 | 3.02 | 46 |
| April 5 | do | 108.0 | 194.0 | 2.27 | 2.51 | 44 |
| April 7 | do | 107.0 | 145.0 | 1.72 | 2.04 | 250 |
| April 26 | do | 61.0 | 71.7 | 1.25 | 1.47 | 90 |
| April 29 | do | 59.5 | 57.3 | 1.24 | 1.28 | 71 |
| May 26 | G. H. Whyte and W. H. Storey | 63.5 | 92.0 | 1.44 | 1.62 | 132 |
| June 18 | W. H. Storey | 116.0 | 179.6 | 1.80 | 2.31 | 324 |
| June 28 | J. E. Degnan | 117.4 | 265.0 | 1.96 | 2.80 | 519 |
| July 17 | W. H. Storey | 116.3 | 130.3 | 1.43 | 1.78 | 187 |
| July 19 | do | 118.3 | 295.0 | 2.23 | 3.13 | 677 |
| Aug. 3 | do | 117.3 | 149.4 | 1.85 | 2.10 | 276 |
| Aug. 5 | do | 117.3 | 119.6 | 1.58 | 1.85 | 189 |
| Aug. 24 | do | 116.3 | 106.7 | 1.38 | 1.68 | 147 |
| Sept. 6 | do | 117.3 | 189.6 | 2.01 | 2.42 | 381 |
| Sept. 7 | do | 117.0 | 139.0 | 1.61 | 1.98 | 224 |
| Sept. 13 | do | 116.3 | 153.0 | 1.77 | 2.10 | 272 |
| Sept. 28 | do | 117.3 | 105.6 | 1.55 | 1.76 | 164 |
| Oct. 16 | do | 116.8 | 135.5 | 1.55 | 1.94 | 210 |
| Oct. 18 | do | 116.3 | 124.9 | 1.59 | 1.87 | 199 |
| Nov. 3 | do | 118.3 | 111.5 | 1.36 | 1.77 | 152 |
| Nov. 20 | do | 117.8 | 102.2 | 1.01 | 2.18 | 104 |
| Dec. 14 | do | 116.3 | 77.6 | 0.78 | 2.00 | 61 |

DAILY GAUGE HEIGHT AND DISCHARGE of Milk River at Milk River, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft* |
| 1 | 2.09 | 29 | 2.58 | 21 | 3.15 | 31 | 1.65 | 138 | 1.35 | 77 | 1.35 | 77 |
| 2 | 2.13 | 29 | 2.59 | 22 | 3.06 | 31 | 2.20 | 304 | 1.48 | 100 | 1.35 | 77 |
| 3 | 2.15 | 30 | 2.61 | 22 | 3.04 | 31 | 2.43 | 386 | 2.20 | 304 | 1.55 | 115 |
| 4 | 2.14 | 30 | 2.66 | 24 | 3.05 | 32 | 3.15 | 684 | 2.10 | 270 | 2.40 | 375 |
| 5 | 2.15 | 30 | 2.77 | 25 | 3.04 | 32 | 2.55 | 432 | 1.95 | 222 | 4.05 | 1,08[illegible] |
| 6 | 2.09 | 29 | 2.77 | 26 | 2.95 | 34 | 2.25 | 322 | 1.77 | 167 | 3.90 | 1,014 |
| 7 | 2.18 | 29 | 2.81 | 26 | 2.94 | 36 | 2.11 | 273 | 1.80 | 177 | 3.15 | 684 |
| 8 | 2.20 | 28 | 2.81 | 26 | 2.95 | 38 | 1.90 | 206 | 1.70 | 150 | 2.50 | 412 |
| 9 | 2.21 | 28 | 2.84 | 26 | 2.95 | 41 | 1.81 | 180 | 1.58 | 122 | 2.29 | 336 |
| 10 | 2.25 | 28 | 2.84 | 25 | 2.91 | 42 | 1.75 | 164 | 1.52 | 108 | 2.15 | 287 |
| 11 | 2.23 | 29 | 2.82 | 25 | 2.91 | 43 | 1.70 | 150 | 1.45 | 95 | 2.90 | 575 |
| 12 | 2.28 | 29 | 2.80 | 25 | 2.89 | 44 | 1.60 | 126 | 1.43 | 91 | 2.35 | 357 |
| 13 | 2.30 | 31 | 2.80 | 27 | 2.93 | 45 | 1.50 | 104 | 1.48 | 100 | 2.20 | 304 |
| 14 | 2.30 | 31 | 2.80 | 27 | 2.97 | 46 | 1.60 | 126 | 1.55 | 115 | 2.10 | 270 |
| 15 | 2.35 | 30 | 2.95 | 28 | 3.02 | 47 | 1.60 | 126 | 1.94 | 218 | 2.15 | 287 |
| 16 | 2.28 | 30 | 2.89 | 29 | 3.04 | 50 | 1.60 | 126 | 2.54 | 428 | 2.31 | 343 |
| 17 | 2.28 | 29 | 2.98 | 29 | 3.07 | 74 | 1.60 | 126 | 2.38 | 368 | 2.35 | 357 |
| 18 | 2.20 | 27 | 2.80 | 29 | 5.22 | 260*a* | 1.55 | 115 | 2.50 | 412 | 2.28 | 332 |
| 19 | 2.20 | 25 | 2.90 | 28 | 6.07 | 600 | 1.54 | 113 | 2.14 | 284 | 2.60 | 451 |
| 20 | 2.10 | 22 | 2.95 | 28 | 5.01 | 900 | 1.53 | 111 | 2.12 | 277 | 2.57 | 439 |
| 21 | 2.30 | 21 | 2.95 | 28 | 5.02 | 900 | 1.56 | 117 | 1.96 | 225 | 2.24 | 318 |
| 22 | 2.35 | 22 | 3.00 | 28 | 6.61 | 1,200 | 1.55 | 115 | 1.86 | 194 | 2.00 | 237 |
| 23 | 2.38 | 22 | 3.00 | 30 | 4.53 | 1,050 | 1.54 | 113 | 1.73 | 158 | 1.90 | 206 |
| 24 | 2.34 | 22 | 3.05 | 30 | 3.42 | 800 | 1.53 | 111 | 1.72 | 155 | 1.87 | 197 |
| 25 | 2.33 | 22 | 3.05 | 31 | 2.38 | 300 | 1.45 | 95 | 1.66 | 140 | 2.00 | 237 |
| 26 | 2.36 | 22 | 3.05 | 31 | 2.06 | 230*a* | 1.46 | 96 | 1.62 | 131 | 4.40 | 1,234 |
| 27 | 2.30 | 22 | 3.05 | 31 | 1.99 | 234 | 1.32 | 72 | 1.60 | 126 | 3.65 | 904 |
| 28 | 2.40 | 21 | 3.07 | 31 | 1.62 | 131 | 1.30 | 69 | 1.52 | 108 | 2.95 | 596 |
| 29 | 2.44 | 21 | ..... | ..... | 1.80 | 203 | 1.25 | 62 | 1.44 | 93 | 2.75 | 512 |
| 30 | 2.44 | 21 | ..... | ..... | 1.79 | 174 | 1.28 | 66 | 1.41 | 87 | 2.30 | 339 |
| 31 | 2.54 | 21 | ..... | ..... | 1.74 | 161 | ..... | ..... | 1.35 | 77 | | |

*a* to *a* Ice breaking up. Discharge estimated.

DAILY GAUGE HEIGHT AND DISCHARGE of Milk River at Milk River, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.10 | 270 | 2.12 | 277 | 1.40 | 85 | 1.77 | 169 | 1.75 | 163 | 2.08 | 85 |
| 2 | 2.20 | 304 | 2.30 | 339 | 1.54 | 113 | 1.73 | 158 | 1.77 | 169 | 2.15 | 84 |
| 3 | 2.30 | 339 | 2.10 | 270 | 1.95 | 222 | 1.80 | 177 | 1.79 | 174 | 2.15 | 82 |
| 4 | 2.18 | 297 | 2.00 | 237 | 3.75 | 948 | 1.90 | 206 | 1.80 | 177 | 2.18 | 81 |
| 5 | 2.34 | 353 | 1.85 | 191 | 2.70 | 492 | 2.00 | 237 | 1.80 | 177 | 2.23 | 80 |
| 6 | 2.10 | 270 | 1.75 | 163 | 2.10 | 270 | 1.98 | 231 | 1.80 | 177 | 2.25 | 79 |
| 7 | 2.05 | 253 | 1.66 | 140 | 1.88 | 200 | 1.95 | 222 | 1.80 | 177 | 2.25 | 78 |
| 8 | 2.05 | 253 | 1.62 | 131 | 1.75 | 164 | 1.95 | 222 | 1.80 | 177 | 2.25 | 77 |
| 9 | 1.95 | 222 | 1.60 | 126 | 1.73 | 158 | 2.00 | 237 | 1.60 | 126 | 2.20 | 76 |
| 10 | 1.85 | 191 | 1.56 | 117 | 1.70 | 150 | 2.02 | 244 | 1.65 | 138 | 2.25 | 73 |
| 11 | 1.84 | 189 | 1.55 | 115 | 1.90 | 206 | 1.90 | 206 | 1.75*c* | 131 | 2.23 | 71 |
| 12 | 1.80 | 177 | 1.65 | 138 | 2.13 | 280 | 1.93 | 215 | 1.75 | 124 | 2.08 | 68 |
| 13 | 1.74 | 161 | 1.59 | 124 | 2.12 | 277 | 1.95 | 222 | 1.78 | 117 | 2.05 | 64 |
| 14 | 1.71 | 153 | 1.54 | 113 | 2.05 | 253 | 1.95 | 222 | 1.90 | 110 | 2.01 | 61 |
| 15 | 1.70 | 150 | 1.55 | 115 | 2.05 | 253 | 1.90 | 206 | 1.89 | 106 | 2.06 | 59 |
| 16 | 1.70 | 150 | 1.54 | 113 | 1.97 | 228 | 1.94 | 218 | 1.95 | 102 | 2.11 | 59 |
| 17 | 1.77 | 169 | 1.57 | 119 | 1.90 | 206 | 1.95 | 222 | 1.85 | 100 | 2.11 | 59 |
| 18 | 1.84 | 189 | 1.54 | 113 | 1.84 | 189 | 1.85 | 191 | 2.01*c* | 100 | 2.11 | 59 |
| 19 | 3.12 | 671 | 1.55 | 115*b* | 1.80 | 177 | 1.83 | 186 | 2.11*d* | 102 | 2.08 | 58 |
| 20 | 2.39 | 371 | 1.90 | 206 | 1.76 | 166 | 1.80 | 177 | 2.18 | 104 | 2.09 | 57 |
| 21 | 2.03 | 247 | 1.95 | 222 | 1.80 | 177 | 1.77 | 169 | 2.10 | 103 | 2.06 | 56 |
| 22 | 1.84 | 187 | 1.70 | 150 | 1.80 | 177 | 1.80 | 177 | 2.05 | 100 | 2.11 | 55 |
| 23 | 1.75 | 164 | 1.70 | 150 | 1.75 | 164 | 1.78 | 172 | 2.12 | 97 | 2.13 | 53 |
| 24 | 1.74 | 161 | 1.67 | 143 | 1.74 | 161 | 1.73 | 158 | 2.10 | 95 | 2.11 | 52 |
| 25 | 1.75 | 164 | 1.70 | 150 | 1.77 | 169 | 1.77 | 169 | 2.05 | 92 | 2.16 | 50 |
| 26 | 1.85 | 191 | 1.55 | 115 | 1.80 | 177 | 1.70 | 150 | 1.95 | 89 | 2.14 | 48 |
| 27 | 1.85 | 191 | 1.51 | 106 | 1.80 | 177 | 1.70 | 150 | 1.92 | 86 | 2.16 | 47 |
| 28 | 2.32 | 346 | 1.46 | 96 | 1.75 | 164 | 1.73 | 158 | 1.80 | 81 | 2.19 | 45 |
| 29 | 2.48 | 404 | 1.45 | 95 | 1.77 | 169 | 1.75 | 164 | 1.95 | 83 | 2.19 | 44 |
| 30 | 2.88 | 567 | 1.43 | 91 | 1.78 | 172 | 1.75 | 164 | 2.08 | 85 | 2.24 | 42 |
| 31 | 2.45 | 393 | 1.41 | 87 | ..... | ..... | 1.75 | 164 | ..... | ..... | 2.11 | 40 |

*b* Interpolated
*c* Channel closing. Discharge estimated.
*d* Ice conditions.

MONTHLY DISCHARGE of Milk River at Milk River, for 1915.

(Drainage area 1,104 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 31 | 21 | 26 | 0.024 | 0.03 | 1,599 |
| February | 31 | 21 | 27 | 0.024 | 0.03 | 1,500 |
| March | 1,200 | 31 | 253 | 0.229 | 0.26 | 15,556 |
| April | 684 | 62 | 174 | 0.158 | 0.18 | 10,354 |
| May | 428 | 77 | 180 | 0.163 | 0.19 | 11,068 |
| June | 1,234 | 77 | 432 | 0.391 | 0.44 | 25,706 |
| July | 671 | 150 | 263 | 0.238 | 0.27 | 16,171 |
| August | 339 | 87 | 151 | 0.137 | 0.16 | 9,285 |
| September | 948 | 85 | 225 | 0.204 | 0.23 | 13,388 |
| October | 244 | 150 | 192 | 0.174 | 0.20 | 11,806 |
| November | 177 | 81 | 122 | 0.111 | 0.12 | 7,260 |
| December | 85 | 40 | 63 | 0.057 | 0.07 | 3,874 |
| The year | ..... | ..... | ..... | ..... | 2.18 | 127,567 |

MILK RIVER AT WRITING-ON-STONE POLICE DETACHMENT.

*Location.*—On SW. ¼ Sec. 35, Tp. 1, Rge. 13, W. 4th Mer.
*Records available.*—August 2, 1909, to October 31, 1915.
*Gauge.*—Vertical staff. Zero maintained at elevation, 86.13 feet since establishment.
*Bench-mark.*—Permanent iron bench-mark. Assumed elevation 100.00 feet.
*Channel.*—Composed of sand and shifts in changes of stage.
*Discharge measurements.*—Made from a cable and car during high water and at low stages by wading.
*Observer.*—A. P. White and W. Adams.

DISCHARGE MEASUREMENTS of Milk River at Writing-on-Stone Police Detachment, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 18 | W. H. Storey | 135.0 | 125.5 | 0.92 | 3.00 | 116 |
| Mar. 30 | do | 126.0 | 136.0 | 2.03 | 2.59 | 276 |
| April 11 | do | 59.0 | 99.7 | 1.92 | 2.30 | 192 |
| April 23 | do | 73.0 | 73.7 | 1.54 | 1.98 | 114 |
| May 2 | do | 73.0 | 66.6 | 1.35 | 1.80 | 90 |
| May 20 | do | 112.0 | 163.8 | 1.80 | 2.65 | 294 |
| May 29 | G. H. Whyte and W. H. Storey | 72.5 | 71.8 | 1.61 | 1.97 | 116 |
| June 15 | W. H. Storey | 111.0 | 139.1 | 2.02 | 2.69 | 280 |
| June 23 | do | 86.0 | 111.2 | 2.02 | 2.55 | 225 |
| July 13 | do | 86.0 | 104.6 | 1.77 | 2.38 | 185 |
| July 21 | do | 108 5 | 160.4 | 2.06 | 2.87 | 331 |
| July 31 | do | 130.0 | 231.5 | 2.28 | 3.38 | 528 |
| Aug. 7 | do | 74.0 | 91.2 | 1.68 | 2.24 | 154 |
| Aug. 18 | do | 73.0 | 80.6 | 1.49 | 2.05 | 120 |
| Aug. 25 | do | 74.0 | 92.4 | 1.58 | 2.20 | 146 |
| Sept. 4 | do | 84.0 | 109.2 | 1.83 | 2.51 | 199 |
| Sept. 5 | do | 132.0 | 355.0 | 2.34 | 4 09 | 833 |
| Sept. 15 | do | 101.0 | 126.1 | 1.92 | 2.62 | 242 |
| Sept. 24 | do | 92.0 | 105.7 | 1.58 | 2.28 | 167 |
| Oct. 2 | do | 91.0 | 103.2 | 1.59 | 2.25 | 164 |
| Oct. 4 | do | 91.0 | 102.8 | 1.60 | 2.26 | 164 |
| Oct. 13 | do | 89.0 | 114.6 | 1.62 | 2.43 | 186 |
| Oct. 19 | do | 89.0 | 112.8 | 1.61 | 2 36 | 181 |
| Oct. 30 | do | 85.0 | 92.3 | 1.53 | 2.19 | 142 |

DAILY GAUGE HEIGHT AND DISCHARGE of Milk River at Writing-on-Stone Police Detachment, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.45 | 233 | 1.74 | 83 | 1.89 | 100 |
| 2 | ..... | ..... | 2.46 | 236 | 1.80 | 90 | 1.90 | 102 |
| 3 | ..... | ..... | 3.05 | 417 | 2.16 | 157 | 2.00 | 118 |
| 4 | ..... | ..... | 3.30 | 501 | 2.79 | 335 | 2.90 | 360 |
| 5 | ..... | ..... | 3.70 | 664 | 2.80 | 338 | 4.20 | 862 |
| 6 | ..... | ..... | 3.05 | 417 | 2.83 | 347 | 4.80 | 1,120 |
| 7 | ..... | ..... | 2.70 | 308 | 2.74 | 320 | 4.75 | 1,094 |
| 8 | ..... | ..... | 2.58 | 272 | 2.26 | 181 | 4.53 | 999 |
| 9 | ..... | ..... | 2.49 | 245 | 2.25 | 178 | 3.80 | 681 |
| 10 | ..... | ..... | 2.70 | 308 | 2.20 | 166 | 2.90 | 350 |
| 11 | ..... | ..... | 2.69 | 305 | 2.10 | 143 | 2.77 | 311 |
| 12 | ..... | ..... | 2.22 | 171 | 1.85 | 98 | 3.30 | 477 |
| 13 | ..... | ..... | 2.20 | 166 | 1.84 | 96 | 2.78 | 311 |
| 14 | ..... | ..... | 2.14 | 152 | 1.91 | 107 | 2.80 | 314 |
| 15 | ..... | ..... | 2.16 | 157 | 1.96 | 116 | 3.02 | 382 |
| 16 | ..... | ..... | 2.12 | 148 | 2.46 | 236 | 2.73 | 290 |
| 17 | ..... | ..... | 2.13 | 150 | 3.12 | 440 | 2.81 | 314 |
| 18 | ..... | ..... | 2.12 | 148 | 3.03 | 411 | 2.84 | 320 |
| 19 | 4.45 | 400*a* | 2.11 | 145 | 2.98 | 395 | 2.90 | 335 |
| 20 | 5.25 | 1,000 | 2.09 | 141 | 2.65 | 293 | 3.16 | 417 |
| 21 | 3.43 | 500 | 2.11 | 145 | 2.62 | 284 | 3.10 | 395 |
| 22 | 3.85 | 650 | 2.02 | 127 | 2.50 | 248 | 2.87 | 320 |
| 23 | 5.20 | 1,100*a* | 2.00 | 123 | 2.22 | 171 | 2.60 | 237 |
| 24 | 4.50 | 1,008 | 2.03 | 129 | 2.20 | 166 | 2.61 | 240 |
| 25 | 3.80 | 707 | 1.97 | 118 | 2.17 | 159 | 2.60 | 237 |
| 26 | 3.00 | 401 | 1.98 | 119 | 2.14 | 152 | 2.63 | 246 |
| 27 | 2.65 | 293 | 1.82 | 93 | 2.10 | 143 | 4.74 | 1,111 |
| 28 | 2.50 | 248 | 1.81 | 92 | 2.07 | 137 | 3.80 | 707 |
| 29 | 2.45 | 233 | 1.80 | 90 | 1.97 | 118 | 3.84 | 724 |
| 30 | 2.54 | 260 | 1.75 | 84 | 1.88 | 100 | 3.40 | 539 |
| 31 | 2.50 | 248 | ..... | ..... | 1.92 | 107 | ..... | ..... |

*a* to *a* Est'mated.

DAILY GAUGE HEIGHT AND DISCHARGE of Milk River at Writing-on-Stone Police Detachment for 1915.—*Concluded.*

| Day. | July. | | August. | | September | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.20 | 459 | 3.05 | 399 | 2.14 | 135 | 2.26 | 156 |
| 2 | 2.83 | 313 | 2.63 | 246 | 2.27 | 158 | 2.25 | 155 |
| 3 | 2.84 | 317 | 2.95 | 360 | 2.36 | 177 | 2.33 | 170 |
| 4 | 2.83 | 313 | 2.63 | 246 | 2.53 | 218 | 2.26 | 156 |
| 5 | 2.84 | 317 | 2.44 | 195 | 4.17 | 866 | 2.29 | 162 |
| 6 | 2.76 | 288 | 2.43 | 193 | 3.30 | 499 | 2.32 | 168 |
| 7 | 2.74 | 282 | 2.27 | 158 | 2.70 | 268 | 2.39 | 183 |
| 8 | 2.73 | 278 | 2.20 | 145 | 2.53 | 218 | 2.45 | 197 |
| 9 | 2.80 | 302 | 2.09 | 126 | 2.39 | 183 | 2.42 | 190 |
| 10 | 2.79 | 299 | 2.07 | 123 | 2.41 | 187 | 2.45 | 197 |
| 11 | 2.49 | 207 | 2.06 | 122 | 2.30 | 164 | 2.54 | 221 |
| 12 | 2.45 | 197 | 2.05 | 121 | 2.90 | 340 | 2.50 | 210 |
| 13 | 2.37 | 179 | 2.22 | 149 | 2.70 | 268 | 2.51 | 213 |
| 14 | 2.35 | 174 | 2.10 | 128 | 2.73 | 278 | 2.49 | 208 |
| 15 | 2.33 | 170 | 2.08 | 125 | 2.65 | 253 | 2.47 | [illegible] |
| 16 | 2.33 | 170 | 2.09 | 126 | 2.59 | 234 | 2.45 | 197 |
| 17 | 2.33 | 170 | 2.06 | 122 | 2.54 | 221 | 2.43 | 193 |
| 18 | 2.34 | 172 | 2.06 | 122 | 2.41 | 187 | 2.40 | 185 |
| 19 | 2.35 | 174 | 2.05 | 121 | 2.37 | 179 | 2.37 | 179 |
| 20 | 3.38 | 531 | 2.06 | 122 | 2.30 | 164 | 2.32 | [illegible] |
| 21 | 2.91 | 344 | 2.08 | 125 | 2.25 | 155 | 2.30 | 164 |
| 22 | 2.54 | 221 | 2.66 | 256 | 2.30 | 164 | 2.25 | [illegible] |
| 23 | 2.49 | 207 | 2.21 | 147 | 2.32 | 168 | 2.24 | [illegible] |
| 24 | 2.42 | 190 | 2.20 | 145 | 2.29 | 162 | 2.2[illegible] | 171 |
| 25 | 2.52 | 215 | 2.20 | 145 | 2.26 | 156 | 2.25 | [illegible] |
| 26 | 2.40 | 185 | 2.14 | 135 | 2.26 | 156 | 2.22 | [illegible] |
| 27 | 2.36 | 177 | 2.10 | 128 | 2.34 | 172 | 2.21 | 147 |
| 28 | 2.44 | 195 | 2.09 | 127 | 2.30 | 164 | 2.21 | 147 |
| 29 | 3.41 | 543 | 2.08 | 125 | 2.28 | 160 | 2.19 | [illegible] |
| 30 | 3.20 | 459 | 2.09 | 127 | 2.25 | 155 | 2.2[illegible] | [illegible] |
| 31 | 3.26 | 483 | 2.10 | 128 | ..... | ..... | 2.2[illegible] | 171 |

MONTHLY DISCHARGE of Milk River at Writing-on-Stone Police Detachment, for 1915

(Drainage area 1,546 square miles.)

| Month | Discharge in Second-Feet | | | | Run-Off | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area | Total in Acre-feet |
| March (19-31) | 1,100 | 233 | 542 | 0.351 | 0.17 | [illegible] |
| April | 664 | 84 | 213 | 0.138 | 0.15 | 12,674 |
| May | 440 | 83 | 204 | 0.132 | 0.15 | 12,[illegible] |
| June | 1,120 | 100 | 467 | 0.302 | 0.34 | 27,788 |
| July | 543 | 170 | 275 | 0.178 | 0.21 | 16,9[illegible] |
| August | 399 | 121 | 162 | 0.105 | 0.12 | [illegible] |
| September | 866 | 135 | 227 | 0.147 | 0.16 | 15,[illegible] |
| October | 221 | 143 | 173 | 0.112 | 0.13 | 10,6[illegible] |
| The period | ..... | ..... | ..... | ..... | 1.43 | 117,[illegible] |

DEER CREEK AT DICKINSON'S RANCH.

*Location.*—On the SW. ¼ Sec. 15, Tp. 1, Rge. 12, W. 4th Mer.

*Records available.*—May 26, 1911, to November 7, 1911, May 3, 1915, to October 31, 1915. Discharge measurements only in 1912–14.

*Gauge.*—Vertical staff. Zero elevation, maintained at 90.72 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—One channel at all stages.

*Discharge measurements.*—At low stages made by wading; at high stages can be made from traffic bridge 200 feet above gauge.

*Observer.*—H. E. Sammons.

DISCHARGE MEASUREMENTS of Deer Creek at Dickinson's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean. Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 3 | W. H. Storey | 7.0 | 2.09 | 0.49 | 1.68 | 1.03 |
| May 20 | do | 16.0 | 5.70 | 1.47 | 2.00 | 8.35 |
| June 15 | do | 17.0 | 10.20 | 0.47 | 1.90 | 4.80 |
| June 24 | do | 12.0 | 4.40 | 1.45 | 1.88 | 6.40 |
| July 22 | do | 8.5 | 2.55 | 1.18 | 1.78 | 3.02 |
| Aug. 8 | do | 9.5 | 2.38 | 0.87 | 1.75 | 2.06 |
| Aug. 18 | do | 5.5 | 2.48 | 0.49 | 1.67 | 1.21 |
| Aug. 26 | do | 5.0 | 2.10 | 0.37 | 1.64 | 0.77 |
| Sept. 4 | do | 5.3 | 2.46 | 0.44 | 1.68 | 1.09 |
| Sept. 16 | do | 5.5 | 2.59 | 0.43 | 1.67 | 1.11 |
| Sept. 24 | do | 5.5 | 2.23 | 0.37 | 1.65 | 0.83 |
| Oct. 5 | do | 6.0 | 2.60 | 0.50 | 1.71 | 1.37 |
| Oct. 13 | do | 6.0 | 2.60 | 0.50 | 1.69 | 1.31 |
| Oct. 20 | do | 6.0 | 2.60 | 0.48 | 1.69 | 1.25 |

DAILY GAUGE HEIGHT AND DISCHARGE of Deer Creek at Dickinson's Ranch, for 1915.

| Day. | May. | | June. | | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.74 | 1.82 | 1.83 | 4.50 | 1.85 | 4.00 | 1.60 | 0.52 | 1.64 | 0.83 |
| 2 | ..... | ..... | 1.74 | 1.82 | 1.83 | 4.50 | 1.83 | 3.50 | 1.79 | 2.50 | 1.65 | 0.91 |
| 3 | 1.68 | 1.14 | 2.60 | 34.00 | 1.83 | 4.50 | 1.80 | 3.00 | 1.77 | 2.20 | 1.68 | 1.14 |
| 4 | 1.69 | 1.22 | 3.00 | 51.00 | 1.81 | 4.00 | 1.80 | 3.00 | 1.73 | 1.69 | 1.68 | 1.14 |
| 5 | 1.68 | 1.14 | 2.70 | 38.00 | 1.80 | 3.70 | 1.78 | 2.70 | 1.70 | 1.30 | 1.71 | 1.40 |
| 6 | 1.67 | 1.07 | 2.50 | 30.00 | 1.78 | 3.40 | 1.75 | 2.00 | 1.68 | 1.14 | 1.68 | 1.14 |
| 7 | 1.66 | 0.99 | 2.02 | 9.10 | 1.78 | 3.40 | 1.75 | 2.00 | 1.66 | 0.99 | 1.66 | 0.99 |
| 8 | 1.63 | 0.75 | 2.01 | 8.70 | 1.78 | 3.40 | 1.75 | 2.00 | 1.66 | 0.99 | 1.66 | 0.99 |
| 9 | 1.60 | 0.52 | 2.00 | 8.30 | 1.78 | 3.40 | 1.74 | 1.82 | 1.70 | 1.30 | 1.66 | 0.99 |
| 10 | 1.60 | 0.52 | 1.97 | 7.20 | 1.77 | 3.20 | 1.73 | 1.69 | 1.70 | 1.30 | 1.71 | 1.40 |
| 11 | 1.60 | 0.52 | 1.95 | 6.50 | 1.77 | 3.20 | 1.70 | 1.30 | 1.71 | 1.40 | 1.71 | 1.40 |
| 12 | 1.61 | 0.60 | 1.95 | 6.50 | 1.77 | 3.20 | 1.70 | 1.30 | 1.71 | 1.40 | 1.70 | 1.30 |
| 13 | 1.76 | 2.10 | 1.95 | 6.50 | 1.79 | 3.50 | 1.70 | 1.30 | 1.71 | 1.40 | 1.70 | 1.30 |
| 14 | 1.76 | 2.10 | 1.95 | 6.50 | 1.79 | 3.50 | 1.68 | 1.14 | 1.67 | 1.07 | 1.69 | 1.22 |
| 15 | 1.85 | 3.60 | 1.95 | 6.50 | 1.75 | 2.80 | 1.68 | 1.14 | 1.67 | 1.07 | 1.68 | 1.14 |
| 16 | 1.95 | 6.50 | 1.95 | 6.90 | 1.75 | 2.80 | 1.68 | 1.14 | 1.67 | 1.07 | 1.68 | 1.14 |
| 17 | 1.95 | 6.50 | 1.95 | 6.90 | 1.83 | 4.50 | 1.68 | 1.14 | 1.67 | 1.07 | 1.68 | 1.14 |
| 18 | 2.00 | 8.30 | 1.95 | 7.20 | 1.83 | 4.50 | 1.67 | 1.07 | 1.67 | 1.07 | 1.68 | 1.14 |
| 19 | 2.00 | 8.30 | 1.93 | 6.50 | 1.81 | 4.00 | 1.67 | 1.07 | 1.68 | 1.14 | 1.68 | 1.14 |
| 20 | 2.00 | 8.30 | 1.93 | 6.90 | 1.79 | 3.50 | 1.68 | 1.14 | 1.67 | 1.07 | 1.69 | 1.22 |
| 21 | 1.95 | 6.50 | 1.93 | 7.20 | 1.79 | 3.50 | 1.67 | 1.07 | 1.66 | 0.99 | 1.68 | 1.14 |
| 22 | 1.90 | 4.70 | 1.93 | 7.20 | 1.78 | 3.40 | 1.66 | 0.99 | 1.66 | 0.99 | 1.68 | 1.14 |
| 23 | 1.85 | 3.60 | 1.92 | 7.20 | 1.79 | 3.40 | 1.65 | 0.91 | 1.65 | 0.91 | 1.68 | 1.14 |
| 24 | 1.85 | 3.60 | 1.92 | 7.10 | 1.79 | 3.40 | 1.65 | 0.91 | 1.65 | 0.91 | 1.68 | 1.14 |
| 25 | 1.80 | 2.60 | 2.00 | 10.20 | 1.77 | 3.00 | 1.64 | 0.83 | 1.65 | 0.91 | 1.67 | 1.07 |
| 26 | 1.80 | 2.60 | 1.93 | 7.50 | 1.77 | 2.80 | 1.64 | 0.83 | 1.65 | 0.91 | 1.67 | 1.07 |
| 27 | 1.73 | 1.69 | 1.90 | 6.30 | 1.77 | 2.80 | 1.63 | 0.75 | 1.65 | 0.91 | 1.67 | 1.07 |
| 28 | 1.73 | 1.69 | 1.87 | 5.50 | 1.76 | 2.70 | 1.61 | 0.60 | 1.65 | 0.91 | 1.67 | 1.07 |
| 29 | 1.74 | 1.82 | 1.84 | 4.70 | 1.93 | 6.30 | 1.61 | 0.60 | 1.65 | 0.91 | 1.66 | 0.99 |
| 30 | 1.74 | 1.82 | 1.84 | 4.70 | 1.83 | 3.70 | 1.60 | 0.52 | 1.65 | 0.91 | 1.65 | 0.91 |
| 31 | 1.74 | 1.82 | ..... | ..... | 1.83 | 3.70 | 1.60 | 0.52 | ..... | ..... | 1.65 | 0.91 |

MONTHLY DISCHARGE of Deer Creek at Dickinson's Ranch, for 1915.

(Drainage area 7 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| May (3-31) | 8.30 | 0.52 | 3.00 | 0.429 | 0.46 | 172 |
| June | 51.00 | 1.82 | 10.80 | 1.543 | 1.72 | 643 |
| July | 6.30 | 2.70 | 3.60 | 0.514 | 0.59 | 221 |
| August | 4.00 | 0.52 | 1.48 | 0.211 | 0.24 | 91 |
| September | 2.50 | 0.52 | 1.17 | 0.167 | 0.19 | 70 |
| October | 1.40 | 0.83 | 1.13 | 0.161 | 0.19 | 69 |
| The period | ..... | ..... | ..... | ..... | 3.39 | 1,266 |

DEER CREEK CATTLE COMPANY EAST DITCH FROM DEER CREEK.

*Location.*—On the SW. ¼ Sec. 36, Tp. 1, Rge. 12, W. 4th Mer.

*Records available.*—April 1, 1912, to November 23, 1912, March 31, 1915, to September 11, 1915; discharge measurements only during 1914.

*Gauge.*—Vertical staff. Elevation of zero has been maintained at 93.49 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark located 250 feet below headgates. Assumed elevation, 100.00 feet.

*Discharge measurements.*—Made by wading or with a weir.

*Observer.*—F. W. Webster.

*Remarks.*—The Deer Creek Cattle Company diverts all the water from Deer Creek through their two ditches, except in flood stages.

DISCHARGE MEASUREMENTS of Deer Creek Cattle Company East Ditch from Deer Creek, in 1915.

| Date. | Engineer | Width. | Area of Section. | Mean Velocity. | Gauge Height | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet* | *Sq.-ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 19 | W. H. Storey | ..... | ..... | ..... | 2.23 | 1.228a |
| Mar. 29 | do | ..... | ..... | ..... | 2.09 | 0.441a |
| April 12 | do | ..... | ..... | ..... | 2.15 | 0.674a |
| April 22 | do | ..... | ..... | ..... | 2.10 | 1.204a |
| April 22 | do | 4.0 | 1.50 | 0.83 | 2.10 | 1.240 |
| May 4 | do | ..... | ..... | ..... | 1.94 | 0.609a |
| May 4 | do | 3.4 | 0.83 | 0.77 | 1.94 | 0.640 |
| May 19 | do | ..... | ..... | ..... | 2.42 | 5.691a |
| May 19 | do | 6.4 | 3.34 | 1.75 | 2.42 | 5.860 |
| June 15 | do | 7.0 | 3.00 | 1.36 | 3.11 | 5.320 |
| June 15 | do | ..... | ..... | ..... | 3.11 | 5.400a |
| June 24 | do | ..... | ..... | ..... | 3.14 | Nil |
| July 12 | do | 4.8 | 2.37 | 1.03 | 2.19 | 2.400 |
| July 22 | do | 3.7 | 1.43 | 0.71 | 1.97 | 1.020 |
| July 30 | do | 9.0 | 3.90 | 1.43 | 2.40 | 5.600 |
| Aug. 8 | do | 4.4 | 1.78 | 0.95 | 2.11 | 1.690 |
| Aug. 17 | do | 4.0 | 1.45 | 0.48 | 1.96 | 0.700 |
| Aug. 26 | do | 4.0 | 1.02 | 0.26 | 1.77 | 0.270 |
| Sept. 3 | do | 4.3 | 1.59 | 0.57 | 2.11 | 0.910 |
| Sept. 16 | do | 4.5 | 1.85 | 0.32 | 2.20 | 0.600 |
| Sept. 23 | do | 4.5 | 1.70 | 0.35 | 2.11 | 0.590 |
| Oct. 5 | do | 5.0 | 2.10 | 0.68 | 2.31 | 1.430 |
| Oct. 12 | do | 4.8 | 1.47 | 0.58 | 2.32 | 0.850 |
| Oct. 20 | do | 4.8 | 1.47 | 0.56 | 2.32 | 0.820 |
| Oct. 29 | do | 4.5 | 1.34 | 0.69 | 2.27 | 0.920 |

a Weir measurements.

DAILY GAUGE HEIGHT AND DISCHARGE of Deer Creek Cattle Company East Ditch from Deer Creek, for 1915.

| Day. | March. | | April. | | May | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Geight. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.37 | 2.70 | 1.94 | 0.65 | 2.09 | 1.19 |
| 2 | ..... | ..... | 2.37 | 2.70 | 1.94 | 0.65 | 2.49 | 8.00 |
| 3 | ..... | ..... | 2.37 | 2.70 | 1.94 | 0.65 | 3.89 | 8.00 |
| 4 | ..... | ..... | 2.36 | 2.50 | 1.94 | 0.65 | 3.89 | 8.00 |
| 5 | ..... | ..... | 2.33 | 2.20 | 1.92 | 0.59 | 3.89 | 8.00 |
| 6 | ..... | ..... | 2.31 | 1.93 | 1.91 | 0.57 | 3.49 | 8.00 |
| 7 | ..... | ..... | 2.31 | 1.93 | 1.89 | 0.52 | 3.49 | 8.00 |
| 8 | ..... | ..... | 2.21 | 1.08 | 1.88 | 0.50 | .....b | ..... |
| 9 | ..... | ..... | 2.21 | 1.08 | 1.87 | 0.48 | ..... | ..... |
| 10 | ..... | ..... | 2.21 | 1.08 | 1.86 | 0.46 | ..... | ..... |
| 11 | ..... | ..... | 2.21 | 1.08 | 1.60 | 0.05 | ..... | |
| 12 | ..... | ..... | 2.15 | 0.79 | 1.56 | 0.03 | ..... | |
| 13 | ..... | ..... | 2.15 | 0.84 | 2.10 | 1.23 | ..... | |
| 14 | ..... | ..... | 2.15 | 0.89 | 2.10 | 1.23 | ..... | |
| 15 | ..... | ..... | 2.15 | 0.95 | 2.10 | 1.23 | ..... | |
| 16 | ..... | ..... | 2.21 | 1.49 | 2.10 | 1.23 | ..... | |
| 17 | ..... | ..... | 2.21 | 1.57 | 2.42 | 5.90 | ..... | |
| 18 | ..... | ..... | 2.21 | 1.65 | 2.42 | 5.90 | ..... | |
| 19 | ..... | ..... | 2.21 | 1.73 | 2.42 | 5.90 | ..... | |
| 20 | ..... | ..... | 2.11 | 1.00 | 2.35 | 4.20 | ..... | |
| 21 | ..... | ..... | 2.11 | 1.08 | 2.35 | 4.20 | ..... | |
| 22 | ..... | ..... | 2.10 | 1.23 | 2.35 | 4.20 | ..... | |
| 23 | ..... | ..... | 2.10 | 1.23 | 2.30 | 3.20 | ..... | |
| 24 | ..... | ..... | 2.10 | 1.23 | 2.30 | 3.20 | ..... | |
| 25 | ..... | ..... | 2.09 | 1.19 | 2.26 | 2.70 | ..... | |
| 26 | ..... | ..... | 2.07 | 1.10 | 2.26 | 2.70 | ..... | |
| 27 | ..... | ..... | 2.04 | 0.98 | 2.24 | 2.40 | ..... | |
| 28 | ..... | ..... | 2.02 | 0.89 | 2.22 | 2.20 | ..... | |
| 29 | ..... | ..... | 1.99 | 0.78 | 2.22 | 2.20 | ..... | |
| 30 | ..... | ..... | 1.98 | 0.76 | 2.22 | 2.20 | ..... | |
| 31 | 2.37a | 2.7 | ..... | ..... | 2.10 | 1.23 | ..... | |

*a* Headgates opened.
*b* Headgates closed.

DAILY GAUGE HEIGHT AND DISCHARGE of Deer Creek Cattle Company East Ditch from Deer Creek, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | ..... | ..... | 1.78*a* | 0.26 |
| 2 | ..... | ..... | ..... | ..... | 1.97 | 0.57 |
| 3 | ..... | ..... | ..... | ..... | 2.11 | 0.94 |
| 4 | ..... | ..... | ..... | ..... | 2.00 | 0.81 |
| 5 | ..... | ..... | ..... | ..... | 2.00 | 0.81 |
| 6 | 2.20*a* | 2.50 | ..... | ..... | 2.05 | 1.03 |
| 7 | 2.40 | 5.60 | ..... | ..... | 2.05 | 1.03 |
| 8 | 2.52 | 9.20 | ..... | ..... | 1.98 | 0.76 |
| 9 | 2.34 | 4.50 | ..... | ..... | 1.95 | 0.68 |
| 10 | 2.41 | 6.00 | ..... | ..... | 1.95 | 0.68 |
| 11 | 2.27 | 3.40 | ..... | ..... | 1.90 | 0.54 |
| 12 | 2.19 | 2.40 | ..... | ..... | .....*b* | ..... |
| 13 | 2.49 | 8.40 | ..... | ..... | ..... | ..... |
| 14 | 2.49 | 8.40 | ..... | ..... | ..... | ..... |
| 15 | 2.34 | 4.50 | ..... | ..... | ..... | ..... |
| 16 | 2.34 | 4.50 | ..... | ..... | ..... | ..... |
| 17 | .....*b* | ..... | 1.90*a* | 0.54 | ..... | ..... |
| 18 | ..... | ..... | 1.94 | 0.65 | ..... | ..... |
| 19 | ..... | ..... | 1.91 | 0.57 | ..... | ..... |
| 20 | ..... | ..... | 1.90 | 0.54 | ..... | ..... |
| 21 | ..... | ..... | 1.86 | 0.46 | ..... | ..... |
| 22 | ..... | ..... | 1.86 | 0.46 | ..... | ..... |
| 23 | ..... | ..... | 1.84 | 0.41 | ..... | ..... |
| 24 | ..... | ..... | 1.81 | 0.35 | ..... | ..... |
| 25 | ..... | ..... | 1.81 | 0.35 | ..... | ..... |
| 26 | ..... | ..... | 1.79 | 0.31 | ..... | ..... |
| 27 | ..... | ..... | 1.79 | 0.31 | ..... | ..... |
| 28 | ..... | ..... | 1.78 | 0.30 | ..... | ..... |
| 29 | ..... | ..... | .....*b* | ..... | ..... | ..... |
| 30 | ..... | ..... | ..... | ..... | ..... | ..... |
| 31 | ..... | ..... | ..... | ..... | ..... | ..... |

*a* Headgates opened
*b* Headgates closed.

MONTHLY DISCHARGE of Deer Creek Cattle Company East Ditch from Deer Creek, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet |
|---|---|---|---|---|
| | Maximum | Minimum | Mean. | |
| March (31) | 2.70 | 2.70 | 2.70 | 5 |
| April | 2.70 | 0.76 | 1.40 | 83 |
| May | 5.90 | 0.03 | 2.00 | 123 |
| June (1-7) | 8.00 | 1.19 | 7.00 | 97 |
| July (6-16) | 9.20 | 2.50 | 5.40 | 118 |
| August (17-28) | 0.65 | 0.30 | 4.30 | 10 |
| September (1-11) | 1.03 | 0.26 | 0.74 | 16 |
| The period | ..... | ..... | ..... | 452 |

DEER CREEK CATTLE COMPANY WEST DITCH FROM DEER CREEK

*Location.*—On the SW. ¼ Sec. 36, Tp. 1, Rge. 12, W. 4th Mer.
*Records available.*—May 17, to July 27, 1915; discharge measurements during 1914.
*Gauge.*—Vertical staff. Zero maintained at elevation of 100.50 feet since establishment.
*Bench-mark.*—Permanent iron bench-mark at East Ditch station. Assumed elevation, 100.00 feet.
*Discharge measurements.*—By wading or with a weir.
*Observer.*—F. W. Webster.

DISCHARGE MEASUREMENTS of Deer Creek Cattle Company West Ditch from Deer Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft* |
| Mar. 19 | W. H. Storey | | | | Dry. | Nil. |
| Mar. 29 | do | | | | " | " |
| April 12 | do | | | | " | " |
| April 22 | do | | | | " | " |
| May 4 | do | | | | " | " |
| May 19 | do | 3.2 | 1.45 | 1.31 | 3.57 | 1.91 |
| June 15 | do | | | | Dry. | Nil. |
| June 24 | do | | | | " | " |
| July 12 | do | | | | " | " |
| July 22 | do | 2.4 | 0.94 | 1.23 | 3.49 | 1.16 |
| July 30 | do | | | | Dry. | Nil. |
| Aug. 8 | do | | | | " | " |
| Aug. 17 | do | | | | " | " |
| Aug. 26 | do | | | | " | " |
| Sept. 3 | do | | | | " | " |
| Sept. 16 | do | | | | " | " |
| Sept. 23 | do | | | | " | " |
| Oct. 5 | do | | | | " | " |
| Oct. 12 | do | | | | " | " |
| Oct. 20 | do | | | | " | " |
| Oct. 29 | do | | | | " | " |

DAILY GAUGE HEIGHT AND DISCHARGE of Deer Creek Cattle Company West Ditch from Deer Creek, for 1915.

| Day. | May. | | July. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |
| 16 | | | | |
| 17 | 3.57*a* | 1.98 | 3.67*a* | 3.30 |
| 18 | 3.57 | 1.98 | 3.67 | 3.30 |
| 19 | 3.57 | 1.98 | 3.67 | 3.30 |
| 20 | 3.50 | 1.22 | 3.62 | 2.60 |
| 21 | 3.50 | 1.22 | 3.62 | 2.60 |
| 22 | 3.45 | 0.96 | 3.62 | 2.60 |
| 23 | 3.45 | 0.96 | 3.62 | 2.60 |
| 24 | 3.45 | 0.96 | 3.62 | 2.60 |
| 25 | *b* | | 3.62 | 2.60 |
| 26 | | | 3.57 | 1.98 |
| 27 | | | 3.57 | 1.98 |
| 28 | | | *b* | |
| 29 | | | | |
| 30 | | | | |
| 31 | | | | |

*a* Headgates opened.
*b* Headgates closed.

MONTHLY DISCHARGE of Deer Creek Cattle Company West Ditch from Deer Creek, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| May (17-24) | 1.98 | 0.96 | 1.41 | 22 |
| July (17-27) | 3.30 | 1.98 | 2.60 | 57 |
| The period | ..... | ..... | ..... | 79 |

FORNFEIST DITCH NEAR ST. KILDA.

*Location.*—On the SW. ¼ Sec. 31, Tp. 1, Rge. 11, W. 4th Mer.
*Records available.*—From September 16, 1915, to October 31, 1915.
*Gauge.*—Vertical staff. Zero maintained at elevation of 98.45 feet since establishment.
*Bench-mark.*—Temporary wooden bench-mark. Assumed elevation, 100.00 feet.
*Discharge measurements.*—Made by wading or by weir.
*Observer.*—Julius Fornfeist.
*Note.*—Station established September 16, 1915, by W. H. Storey.

DISCHARGE MEASUREMENTS of Fornfeist Ditch near St. Kilda, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Sept. 16 | W. H. Storey | 3.0 | 0.56 | 0.36 | 0.65 | 0.200 |
| Sept. 23 | do | 2.0 | 0.48 | 0.21 | 0.55 | 0.100 |
| Oct. 6 | do | 3.0 | 0.65 | 0.35 | 0.68 | 0.230 |
| Oct. 12 | do | ..... | ..... | ..... | ..... | 0.194*a* |
| Oct. 21 | do | ..... | ..... | ..... | ..... | 0.109*a* |
| Oct. 29 | do | ..... | ..... | ..... | ..... | .....*b* |

*a* Measurement made with weir.
*b* Small trickle only.

DAILY GAUGE HEIGHT AND DISCHARGE of Fornfeist Ditch near St. Kilda, for 1915.

| DAY. | September. | | October. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 0.54 | 0.10 |
| 2 | ..... | ..... | 0.54 | 0.10 |
| 3 | ..... | ..... | 0.61 | 0.16 |
| 4 | ..... | ..... | 0.61 | 0.16 |
| 5 | ..... | ..... | 0.61 | 0.16 |
| 6 | ..... | ..... | 0.68 | 0.23 |
| 7 | ..... | ..... | 0.68 | 0.23 |
| 8 | ..... | ..... | 0.65 | 0.20 |
| 9 | ..... | ..... | 0.65 | 0.20 |
| 10 | ..... | ..... | 0.65 | 0.20 |
| 11 | ..... | ..... | 0.68 | 0.23 |
| 12 | ..... | ..... | 0.65 | 0.20 |
| 13 | ..... | ..... | 0.65 | 0.20 |
| 14 | ..... | ..... | 0.65 | 0.20 |
| 15 | ..... | ..... | 0.65 | 0.20 |
| 16 | 0.65 | 0.20 | 0.60 | 0.15 |
| 17 | 0.60 | 0.15 | 0.60 | 0.15 |
| 18 | 0.60 | 0.15 | 0.60 | 0.15 |
| 19 | 0.59 | 0.14 | 0.60 | 0.15 |
| 20 | 0.55 | 0.11 | 0.55 | 0.11 |
| 21 | 0.55 | 0.11 | 0.55 | 0.11 |
| 22 | 0.53 | 0.10 | 0.55 | 0.11 |
| 23 | 0.52 | 0.09 | 0.50 | 0.07 |
| 24 | 0.55 | 0.11 | 0.50 | 0.07 |
| 25 | 0.55 | 0.11 | 0.45 | 0.04 |
| 26 | 0.55 | 0.11 | 0.45 | 0.04 |
| 27 | 0.54 | 0.10 | 0.40 | 0.02 |
| 28 | 0.54 | 0.10 | 0.38 | 0.02 |
| 29 | 0.54 | 0.10 | 0.35 | 0.01 |
| 30 | 0.54 | 0.10 | 0.35 | 0.01 |
| 31 | ..... | ..... | 0.35 | 0.01 |

MONTHLY DISCHARGE of Fornfeist Ditch near St. Kilda, for 1915.

| MONTH. | DISCHARGE IN SECOND-FEET. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| September (16-31) | 0.20 | 0.09 | 0.12 | 4 |
| October | 0.23 | 0.01 | 0.13 | 8 |
| The period | ..... | ..... | ..... | 12 |

MILK RIVER AT PENDANT D'OREILLE POLICE DETACHMENT.

*Location.*—On SW. ¼ Sec. 21, Tp. 2, Rge. 8, W. 4th Mer.
*Records available.*—August 5, 1909, to October 31, 1915.
*Gauge.*—Vertical staff. Zero maintained at elevation of 82.45 feet since establishment.
*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.
*Channel.*—Composed of sand and shifts in change of stage.
*Discharge measurements.*—Made from a cable and car during high water, at low stages by wading.
*Observer.*—R. G. Lipton.

DISCHARGE MEASUREMENTS of Milk River at Pendant d'Oreille Police Detachment, in 1915.

| Date. | Engineer. | Width | Area of Section. | Mean Velocity. | Gauge Height. | Discharge |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft* |
| Mar. 22 | W. H. Storey | 175.0 | 346.0 | 3.12 | 4.32 | 1,082 |
| Mar. 27 | do | 169.0 | 228.0 | 1.51 | 3.41 | 345 |
| April 13 | do | 155.0 | 131.8 | 1.50 | 3.05 | 198 |
| April 19 | do | 67.0 | 87.0 | 1.80 | 2.95 | 156 |
| April 21 | do | 68.0 | 79.0 | 1.66 | 2.83 | 130 |
| May 5 | do | 157.0 | 191.4 | 1.55 | 3.35 | 300 |
| May 18 | do | 162.0 | 262.6 | 2.03 | 3.70 | 534 |
| June 1 | G. H. Whyte and W. H. Storey | 87.5 | 78.7 | 1.47 | 2.81 | 116 |
| June 13 | W. H. Storey | 177.0 | 281.6 | 1.99 | 4.04 | 561 |
| June 26 | do | 133.0 | 167.6 | 1.70 | 3.41 | 285 |
| July 11 | do | 138.0 | 145.6 | 1.80 | 3.30 | 262 |
| July 23 | do | 139.0 | 145.8 | 1.92 | 3.36 | 279 |
| July 30 | do | 142.0 | 205.3 | 2.28 | 3.77 | 469 |
| Aug. 10 | do | 71.0 | 85.6 | 1.65 | 3.00 | 141 |
| Aug. 16 | do | 71.0 | 84.4 | 1.62 | 2.97 | 137 |
| Aug. 28 | do | 69.5 | 65.7 | 1.56 | 2.89 | 102 |
| Sept. 1 | do | 52.5 | 56.3 | 1.47 | 2.74 | 83 |
| Sept. 2 | do | 53.0 | 61.4 | 1.55 | 2.82 | 95 |
| Sept. 18 | do | 104.0 | 137.4 | 1.60 | 3.36 | 220 |
| Sept. 19 | do | 102.0 | 136.6 | 1.55 | 3.30 | 212 |
| Sept 22 | do | 99.0 | 122.0 | 1.36 | 3.19 | 166 |
| Oct. 7 | do | 102.0 | 130.6 | 1.62 | 3.30 | 212 |
| Oct. 11 | do | 103.0 | 135.2 | 1.62 | 3.35 | 219 |
| Oct. 22 | do | 100.0 | 111.6 | 1.50 | 3.20 | 167 |
| Oct. 28 | do | 100.0 | 95.4 | 1.62 | 3.10 | 154 |

DAILY GAUGE HEIGHT AND DISCHARGE of Milk River at Pendant d'Oreille Police Detachment, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height | Discharge. | Gauge Height. | Discharge |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 3.37 | 311 | 2.65 | 86 | 2.91 | 144 |
| 2 | ..... | ..... | 3.35 | 301 | 2.65 | 86 | 2.94 | 144 |
| 3 | ..... | ..... | 3.40 | 325 | 2.65 | 86 | 3.24 | 232 |
| 4 | ..... | ..... | 3.90 | 700 | 2.68 | 91 | 3.34 | 261 |
| 5 | ..... | ..... | 4.06 | 845 | 3.30 | 277 | 4.01 | 709 |
| 6 | ..... | ..... | 4.13 | 910 | 3.30 | 277 | 5.30 | 1,866 |
| 7 | ..... | ..... | 3.75 | 572 | 3.25 | 256 | 5.03 | 1,600 |
| 8 | ..... | ..... | 3.48 | 373 | 3.10 | 201 | 4.60 | 1,176 |
| 9 | ..... | ..... | 3.40 | 325 | 3.01 | 172 | 4.12 | 718 |
| 10 | ..... | ..... | 3.28 | 269 | 2.95 | 155 | 3.70 | 367 |
| 11 | ..... | ..... | 3.18 | 229 | 2.95 | 155 | 3.65 | 325 |
| 12 | ..... | ..... | 3.14 | 215 | 2.87 | 134 | 3.51 | 248 |
| 13 | ..... | ..... | 3.05 | 185 | 2.85 | 129 | 3.96 | 492 |
| 14 | ..... | ..... | 3.00 | 169 | 2.90 | 141 | 3.71 | 337 |
| 15 | ..... | ..... | 3.01 | 172 | 2.95 | 155 | 3.60 | 287 |
| 16 | 4.05*a* | 70 | 3.00 | 169 | 3.11 | 205 | 3.56 | 277 |
| 17 | 4.07 | 95 | 2.95 | 155 | 3.52 | 399 | 3.85 | 454 |
| 18 | 4.22 | 120 | 2.95 | 155 | 3.70 | 530 | 3.65 | 337 |
| 19 | 4.28 | 240 | 2.94 | 152 | 3.65 | 492 | 3.70 | 379 |
| 20 | 4.20 | 450 | 2.91 | 144 | 3.60 | 454 | 3.75 | 426 |
| 21 | 6.91 | 1,400 | 2.83 | 124 | 3.58 | 440 | 3.85 | 507 |
| 22 | 4.32 | 1,080 | 2.82 | 122 | 3.45 | 355 | 3.80 | 484 |
| 23 | 5.98 | 1,000 | 2.80 | 117 | 3.40 | 325 | 3.65 | 392 |
| 24 | 4.92 | 1,250 | 2.82 | 122 | 3.25 | 256 | 3.58 | 355 |
| 25 | 4.42 | 1,150 | 2.80 | 117 | 3.15 | 219 | 3.35 | 252 |
| 26 | 3.95*a* | 700 | 2.75 | 106 | 3.09 | 198 | 3.41 | 282 |
| 27 | 3.30 | 277 | 2.74 | 104 | 3.00 | 169 | 5.11 | 1,649 |
| 28 | 3.32 | 287 | 2.75 | 106 | 2.94 | 152 | 4.55 | 1,123 |
| 29 | 3.41 | 331 | 2.74 | 104 | 2.90 | 141 | 4.13 | 738 |
| 30 | 3.40 | 325 | 2.70 | 95 | 2.85 | 129 | 4.25 | 843 |
| 31 | 3.43 | 343 | ..... | ..... | 2.82 | 122 | ..... | ..... |

*a* to *a* Interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of Milk River at Pendant d'Oreille Police Detachment, for 1915.—*Concluded.*

| DAY. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge | Gauge Height | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.80 | 488 | 3.82 | 502 | 2.76 | 87 | 3.15 | 158 |
| 2 | 3.70 | 429 | 3.68 | 418 | 2.83 | 102 | 3.18 | 166 |
| 3 | 3.60 | 375 | 3.45 | 302 | 2.85 | 104 | 3.20 | 171 |
| 4 | 3.50 | 325 | 3.45 | 302 | 2.95 | 128 | 3.21 | 174 |
| 5 | 3.60 | 375 | 3.43 | 293 | 3.24 | 209 | 3.21 | 174 |
| 6 | 3.55 | 350 | 3.35 | 258 | 4.19 | 764 | 3.25 | 187 |
| 7 | 3.65 | 402 | 3.25 | 220 | 3.65 | 386 | 3.30 | 202 |
| 8 | 3.60 | 375 | 3.15 | 187 | 3.40 | 263 | 3.29 | 199 |
| 9 | 3.48 | 316 | 3.05 | 157 | 3.28 | 216 | 3.31 | 205 |
| 10 | 3.52 | 335 | 3.00 | 143 | 3.20 | 187 | 3.35 | 219 |
| 11 | 3.35 | 258 | 2.98 | 138 | 3.20 | 183 | 3.35 | 219 |
| 12 | 3.20 | 202 | 2.95 | 130 | 3.25 | 199 | 3.32 | 209 |
| 13 | 3.35 | 258 | 2.95 | 130 | 3.46 | 275 | 3.30 | 202 |
| 14 | 3.25 | 220 | 2.95 | 130 | 3.45 | 271 | 3.25 | 187 |
| 15 | 3.28 | 231 | 2.94 | 128 | 3.45 | 267 | 3.31 | 205 |
| 16 | 3.45 | 302 | 2.97 | 136 | 3.40 | 242 | 3.30 | 202 |
| 17 | 3.35 | 258 | 3.00 | 143 | 3.39 | 234 | 3.30 | 202 |
| 18 | 3.25 | 220 | 2.96 | 133 | 3.35 | 220 | 3.29 | 199 |
| 19 | 3.17 | 193 | 2.93 | 126 | 3.30 | 202 | 3.29 | 199 |
| 20 | 3.35 | 258 | 3.15 | 187 | 3.25 | 187 | 3.27 | 192 |
| 21 | 3.99 | 620 | 3.11 | 174 | 3.18 | 166 | 3.21 | 174 |
| 22 | 3.54 | 345 | 3.05 | 157 | 3.20 | 171 | 3.20 | 171 |
| 23 | 3.35 | 258 | 3.20 | 202 | 3.18 | 166 | 3.17 | 163 |
| 24 | 3.33 | 250 | 3.15 | 187 | 3.15 | 158 | 3.15 | 158 |
| 25 | 3.28 | 231 | 3.10 | 171 | 3.15 | 158 | 3.15 | 158 |
| 26 | 3.25 | 220 | 3.05 | 157 | 3.14 | 155 | 3.15 | 158 |
| 27 | 3.23 | 213 | 3.05 | 157 | 3.12 | 149 | 3.13 | 152 |
| 28 | 3.22 | 209 | 2.89 | 116 | 3.15 | 158 | 3.05 | 133 |
| 29 | 3.44 | 297 | 2.87 | 111 | 3.16 | 160 | 3.05 | 133 |
| 30 | 3.86 | 527 | 2.82 | 100 | 3.16 | 160 | 3.08 | 140 |
| 31 | 3.94 | 583 | 2.77 | 89 | ..... | ..... | 3.05 | 133 |

MONTHLY DISCHARGE of Milk River at Pendant d'Oreille Police Detachment, for 1915.

(Drainage area 2,169 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (16-31) | 1,400 | 70 | 570 | 0.263 | 0.16 | 18,089 |
| April | 910 | 95 | 260 | 0.120 | 0.13 | 15,471 |
| May | 530 | 86 | 226 | 0.104 | 0.12 | 13,896 |
| June | 1,866 | 144 | 580 | 0.267 | 0.30 | 34,512 |
| July | 620 | 193 | 320 | 0.148 | 0.17 | 19,676 |
| August | 502 | 89 | 187 | 0.086 | 0.10 | 11,498 |
| September | 764 | 87 | 211 | 0.097 | 0.11 | 12,555 |
| October | 219 | 133 | 179 | 0.083 | 0.10 | 11,006 |
| The period | ..... | ..... | ..... | ..... | 1.19 | 136,703 |

MILK RIVER AT SPENCER'S LOWER RANCH.

*Location.*—South of SE. ¼ Sec. 3, Tp. 1, Rge. 5, W. 4th Mer., on NE. 6-37N.-9 E.P.M., Montana, U.S.A.

*Records available.*—Aug. 7, 1909, to December 25, 1915.

*Gauge.*—Gurley automatic water stage register installed in a wooden shelter, 300 feet south of the international boundary, with a staff gauge inside the stilling box and another outside at the mouth of the intake pipe. Gauges are maintained at an elevation of 2,696.58 feet.

*Bench-mark.*—Permanent iron bench-mark. Elevation, 2,713.64 feet (U.S.G.S. Havre datum), located 1,300 feet upstream from the boundary line, on the left bank.

*Channel.*—Composed of gravel, rock and quicksand and is subject to shifting conditions.

*Discharge measurements.*—Made by wading at low stages and by a cable car structure at high stages.

*Winter flow.*—From December to April the stream is frozen over and no records of value are obtained.

*Observer.*—Frank Galloway.

*Co-operation.*—This station is maintained in conjunction with United States Geological Survey.

DISCHARGE MEASUREMENTS of Milk River at Spencer's Lower Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar 25-26 | W. H. Storey | 138.0 | 199.5 | 2.28 | 4.03 | 454 |
| April 14 | B. E. Jones *a* | 56.0 | 84.0 | 2.32 | 3.09 | 195 |
| April 14 | W. H. Storey | 66.0 | 92.7 | 2.13 | 3.15 | 196 |
| April 15 | do | 65.0 | 88.9 | 2.10 | 3.10 | 186 |
| April 20 | do | 62.5 | 81.8 | 1.85 | 3.04 | 152 |
| April 28 | B. E. Jones *a* | 33.5 | 49.0 | 2.12 | 2.96 | 104 |
| May 6 | W. H. Storey | 162.0 | 169.1 | 1.59 | 3.51 | 268 |
| May 25 | B. E. Jones *a* | 58.0 | 92.0 | 2.11 | 3.28 | 194 |
| June 2 | G. H. Whyte and W. H. Storey | 58.5 | 89.7 | 2.21 | 3.51 | 198 |
| June 11 | W. H. Storey | 112.0 | 185.8 | 2.09 | 3.94 | 388 |
| June 17 | B. E. Jones *a* | 69.0 | 118.0 | 2.89 | 3.85 | 341 |
| June 28 | W. H. Storey | 131.0 | 317.6 | 4.68 | 5.54 | 1,488 |
| July 9 | B. E. Jones *a* | 76.0 | 124.0 | 2.72 | 3.95 | 337 |
| July 26 | W. H. Storey | 120.0 | 146.8 | 1.76 | 3.70 | 259 |
| Aug. 5 | B. E. Jones *a* | 61.5 | 102.0 | 2.90 | 3.87 | 296 |
| Aug. 12 | W. H. Storey | 53.0 | 67.8 | 1.93 | 3.24 | 131 |
| Aug. 23 | W. A. Lamb *a* | 50.0 | 68.0 | 2.13 | 3.27 | 145 |
| Aug. 30 | W. H. Storey | 50.0 | 58.8 | 1.77 | 3.09 | 104 |
| Sept. 18 | W. A. Lamb *a* | 62.0 | 98.0 | 2.27 | 3.75 | 222 |
| Sept. 20 | W. H. Storey | 97.0 | 121.1 | 1.74 | 3.60 | 211 |
| Oct. 8 | do | 61.0 | 90.0 | 2.53 | 3.70 | 228 |
| Oct. 27 | do | 60.0 | 80.2 | 2.21 | 3.61 | 177 |
| Nov. 22 | W. A. Lamb *a* | 37.0 | 63.0 | 1.43 | 3.75 | 90 |

*a* U. S. G. S.

DAILY GAUGE HEIGHT AND DISCHARGE of Milk River at Spencer's Lower Ranch, for 1915.

| Day | March | | April | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft* | *Feet.* | *Sec.-ft* | *Feet* | *Sec.-ft.* |
| 1 | ..... | ..... | 3.64 | 276 | 2.88 | 100 | 3.23 | 180 |
| 2 | ..... | ..... | 3.55 | 245 | 2.88 | 100 | 3.68 | 265 |
| 3 | ..... | ..... | 3.55 | 245 | 2.88 | 100 | 4.10 | 470 |
| 4 | ..... | ..... | 3.60 | 262 | 2.89 | 102 | 3.90 | 365 |
| 5 | ..... | ..... | 4.35 | 709 | 3.00 | 123 | 3.85 | 341 |
| 6 | ..... | ..... | 4.50 | 891 | 3.43 | 239 | 5.20 | 1,220 |
| 7 | ..... | ..... | 5.00 | 1,367 | 3.60 | 300 | 5.00 | 1,060 |
| 8 | ..... | ..... | 4.25 | 754 | 3.42 | 236 | 4.85 | 948 |
| 9 | ..... | ..... | 3.70 | 406 | 3.28 | 192 | 4.60 | 772 |
| 10 | ..... | ..... | 3.60 | 359 | 3.23 | 178 | 4.35 | 614 |
| 11 | ..... | ..... | 3.40 | 279 | 3.19 | 168 | 4.10 | 470 |
| 12 | ..... | ..... | 3.43 | 290 | 3.11 | 148 | 4.85 | 948 |
| 13 | ..... | ..... | 3.38 | 272 | 3.09 | 143 | 3.86 | 346 |
| 14 | ..... | ..... | 3.15 | 202 | 3.14 | 155 | 4.10 | 470 |
| 15 | 4.90*a* | 60 | 3.08 | 187 | 3.38 | 223 | 3.93 | 380 |
| 16 | 5.00 | 70 | 3.11 | 189 | 3.47 | 253 | 3.88 | 355 |
| 17 | 5.10 | 80 | 3.15 | 194 | 3.39 | 226 | 3.90 | 365 |
| 18 | 5.20 | 120 | 3.15 | 189 | 4.10 | 540 | 4.20 | 525 |
| 19 | 5.25 | 250 | 3.13 | 180 | 4.00 | 485 | 4.20 | 525 |
| 20 | 5.55 | 450 | 3.11 | 168 | 3.84 | 403 | 4.15 | 498 |
| 21 | ..... | 850 | 3.11 | 164 | 3.72 | 349 | 4.25 | 554 |
| 22 | ..... | 1,400 | 3.08 | 153 | 3.63 | 312 | 4.35 | 614 |
| 23 | ..... | 1,400 | 3.05 | 143 | 3.59 | 296 | 4.15 | 498 |
| 24 | ..... | 1,750 | 3.06 | 141 | 3.53 | 274 | 3.89 | 360 |
| 25 | ..... | 800 | 3.05 | 136 | 3.40 | 229 | 3.82 | 327 |
| 26 | 4.77 | 400 | 3.03 | 130 | 3.33 | 205 | 3.75 | 295 |
| 27 | 4.76 | 380 | 3.00 | 119 | 3.30 | 197 | 4.20 | 525 |
| 28 | 4.34 | 360 | 3.26 | 166 | 3.23 | 180 | 4.85 | 948 |
| 29 | 3.93 | 320 | 2.88 | 100 | 3.20 | 173 | 4.50 | 644 |
| 30 | 3.63 | 275 | 2.88 | 100 | 3.18 | 168 | 4.45 | 610 |
| 31 | 3.58*a* | 250 | ..... | ..... | 3.12 | 156 | ..... | ..... |

*a* to *a* Estimated.
Ice going out March 21 to 25.

DAILY GAUGE HEIGHT AND DISCHARGE of Milk River at Spencer's Lower Ranch, for 1915. —*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge | Gauge Height. | Discharge. | Gauge Height. | Discharge |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 4.40 | 577 | 4.30 | 515 | 3.02 | 97 | 3.44 | 166 | 3.45 | 136 | 3.85 | 65 |
| 2 | 4.20 | 458 | 4.15 | 432 | 3.04 | 100 | 3.44 | 166 | 3.49 | 143 | 3.68 | 63 |
| 3 | 3.62 | 221 | 3.93 | 330 | 3.09 | 108 | 3.54 | 187 | 3.53 | 151 | 3.90 | 62 |
| 4 | 3.86 | 302 | 3.75 | 262 | 3.46 | 180 | 3.55 | 189 | 3.54 | 153 | 4.00 | 62 |
| 5 | 3.87 | 306 | 3.82 | 287 | 3.24 | 134 | 3.54 | 187 | 3.54 | 153 | 4.05 | 61 |
| 6 | 3.99 | 355 | 3.82 | 287 | 3.82 | 287 | 3.56 | 189 | 3.55 | 156 | 4.10 | 59 |
| 7 | 3.92 | 325 | 3.72 | 252 | 4.30 | 515 | 3.65 | 212 | 3.54 | 153 | 4.17 | 57 |
| 8 | 3.96 | 339 | 3.59 | 212 | 3.89 | 309 | 3.71 | 230 | 3.54 | 153 | 4.25 | 55 |
| 9 | 3.99 | 355 | 3.50 | 189 | 3.74 | 252 | 3.75 | 239 | 3.51 | 147 | 4.25 | 53 |
| 10 | 3.95 | 338 | 3.40 | 166 | 3.63 | 215 | 3.70 | 224 | 3.45 | 136 | 4.30 | 51 |
| 11 | 3.81 | 283 | 3.32 | 149 | 3.54 | 189 | 3.79 | 248 | .....a | 132 | 4.30 | 49 |
| 12 | 3.74 | 259 | 3.26 | 137 | 3.47 | 171 | 3.80 | 252 | ..... | 128 | 4.36 | 48 |
| 13 | 4.45 | 610 | 3.24 | 134 | 3.46 | 166 | 3.75 | 233 | .....b | 124 | 4.35 | 47 |
| 14 | 3.80 | 279 | 3.25 | 136 | 3.53 | 180 | 3.69 | 212 | 3.56 | 120 | 4.30 | 45 |
| 15 | 3.53 | 197 | 3.30 | 145 | 3.69 | 218 | 3.70 | 215 | 3.45 | 116 | 4.15 | 40 |
| 16 | 3.52 | 194 | 3.51 | 192 | 3.70 | 215 | 3.74 | 224 | 3.43 | 112 | 4.10 | 39 |
| 17 | 3.86 | 302 | 3.74 | 259 | 3.69 | 210 | 3.75 | 224 | 3.40 | 108 | 4.12 | 39 |
| 18 | 3.72 | 252 | 3.42 | 171 | 3.66 | 197 | 3.74 | 221 | 3.45 | 104 | 4.05 | 37 |
| 19 | 3.61 | 218 | 3.60 | 215 | 3.63 | 205 | ..... | 213 | 3.60 | 101 | 4.05 | 37 |
| 20 | 3.57 | 207 | 3.92 | 325 | 3.58 | 210 | 3.70 | 205 | 3.72 | 98 | 4.02 | 35 |
| 21 | 4.00 | 359 | 3.40 | 166 | 3.53 | 194 | 3.65 | 192 | 3.70 | 94 | 4.20 | 38 |
| 22 | 4.15 | 432 | 3.30 | 145 | 3.49 | 184 | 3.61 | 180 | 3.80 | 90 | 4.10 | 33 |
| 23 | 4.00 | 359 | 3.30 | 145 | 3.46 | 178 | 3.55 | 164 | 3.94 | 88 | 4.08 | 29 |
| 24 | 3.79 | 276 | 3.46 | 180 | 3.44 | 171 | 3.54 | 162 | 4.14 | 86 | 4.05 | 27 |
| 25 | 3.69 | 242 | 3.40 | 166 | 3.43 | 168 | 3.55 | 162 | 4.14 | 84 | 4.05 | 25 |
| 26 | 3.65 | 230 | 3.24 | 134 | 3.43 | 168 | 3.57 | 164 | 4.18 | 81 | .....a | 25 |
| 27 | 3.52 | 194 | 3.26 | 137 | 3.42 | 164 | 3.57 | 162 | 4.20 | 79 | ..... | 25 |
| 28 | 3.56 | 205 | 3.20 | 126 | 3.42 | 164 | 3.53 | 151 | 4.10 | 77 | ..... | 25 |
| 29 | 4.15 | 432 | 3.13 | 114 | 3.42 | 164 | 3.50 | 145 | 4.02 | 73 | ..... | 25 |
| 30 | 4.10 | 406 | 3.10 | 109 | 3.45 | 168 | 3.46 | 137 | 4.01 | 72 | ..... | 25 |
| 31 | 4.15 | 432 | 3.06 | 103 | ..... | ..... | 3.45 | 136 | ..... | ..... | .....b | 25 |

*a* to *b* No gauge height records; discharge estimated.

MONTHLY DISCHARGE of Milk River at Spencer's Lower Ranch, for 1915.

(Drainage area 2,514 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet |
| March (15-31) | 1,750 | 60 | 542 | 0.216 | 0.137 | 18,271 |
| April | 1,367 | 100 | 300 | 0.119 | 0.133 | 17,851 |
| May | 540 | 100 | 224 | 0.089 | 0.103 | 13,773 |
| June | 1,220 | 180 | 550 | 0.219 | 0.244 | 32,727 |
| July | 610 | 194 | 321 | 0.127 | 0.146 | 19,676 |
| August | 515 | 103 | 204 | 0.081 | 0.093 | 12,543 |
| September | 515 | 97 | 196 | 0.078 | 0.087 | 11,663 |
| October | 252 | 136 | 193 | 0.077 | 0.089 | 11,867 |
| November | 156 | 72 | 115 | 0.046 | 0.051 | 6,843 |
| December | 65 | 25 | 42 | 0.017 | 0.020 | 2,582 |
| The period | | | | | 1.103 | 147,796 |

STUDY OF CONDITIONS OF RUN-OFF in watershed of Milk River from its headwaters to its eastern crossing from Canada, Sec. 3, Tp. 1, Rge. 5, W. of 4th Mer., August 1 to October 31, 1915.

| Station | Area of watershed in square miles | | | | | | Run-off in Acre-feet. | | Run-off per Square mile in Acre-feet. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Additional to last station. | | | Total for Station | | | Additional to last Station | Total for Station | For Additional Area. | For total Area. |
| | Canada | U.S.A. | Total | Canada | U.S.A. | Total | | | | |
| Peters' Ranch (N. Br.), 11-1-23-4 | ..... | ..... | ..... | 10 | 91 | 101 | ..... | 13,311 | ..... | 131.79 |
| Mackie's Ranch (S. Br.), 31-1-18-4 | ..... | ..... | ..... | 90 | 414 | 504 | ..... | 17,205 | ..... | 34.13 |
| Milk River, 28-2-16-4 | 477 | 22 | 499 | 577 | 527 | 1,104 | +3,963 | 34,479 | 7.94 | 31.22 |
| Writing-on-Stone, 35-1-13-4 | 340 | 102 | 442 | 917 | 629 | 1,546 | − 374 | 34,105 | 0.00 | 22.06 |
| Pendant d'Oreille, 16-2-8-4 | 468 | 155 | 623 | 1,385 | 784 | 2,169 | + 954 | 35,059 | 1.53 | 16.16 |
| Spencer's Lower Ranch, 3-1-5-4 | 242 | 103 | 345 | 1,627 | 887 | 2,514 | +1,104 | 36,073 | 2.94 | 14.38 |

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Milk River drainage basin, in 1915.

| Date. | Engineer. | Stream. | Location. | Width. | Area of Section. | Mean Velocity. | Discharge. |
|---|---|---|---|---|---|---|---|
| | | | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Sec.-ft.* |
| Mar 29 | W. H. Story | Bear Gulch Creek | Sec. 30-2-9-4 | 8.0 | 2.80 | 0.40 | 1.190 |
| April 12 | do | do | do | 9.0 | 2.70 | 0.39 | 1.050 |
| April 22 | do | do | do | 4.5 | 1.32 | 0.27 | 0.360 |
| May 4 | do | do | do | 2.3 | 0.39 | 1.03 | 0.400 |
| May 19 | do | do | do | 7.0 | 2.35 | 1.58 | 3.720 |
| June 14 | do | do | do | 11.0 | 9.00 | 0.61 | 5.500 |
| June 25 | do | do | do | 5.5 | 6.15 | 1.54 | 9.500 |
| July 12 | do | do | do | 6.0 | 2.30 | 0.82 | 1.880 |
| July 23 | do | do | do | 6.5 | 3.20 | 0.90 | 2.870 |
| July 30 | do | do | do | 9.0 | 5.00 | 1.58 | 7.900 |
| Aug. 9 | do | do | do | 6.0 | 2.30 | 0.80 | 1.850 |
| Aug. 17 | do | do | do | 10.0 | 7.10 | 1.18 | 8.400 |
| Aug. 27 | do | do | do | ..... | ..... | ..... | 0.217*a* |
| Sept. 3 | do | do | do | ..... | ..... | ..... | 0.171*a* |
| Sept. 17 | do | do | do | 5.0 | 1.50 | 0.35 | 0.530 |
| Sept. 23 | do | do | do | 4.0 | 1.70 | 0.33 | 0.560 |
| Oct. 6 | do | do | do | 4.5 | 2.00 | 0.24 | 0.480 |
| Oct. 12 | do | do | do | 4.5 | 1.80 | 0.23 | 0.420 |
| Oct. 21 | do | do | do | 2.5 | 0.49 | 0.33 | 0.160 |
| Oct. 29 | do | do | do | 4.0 | 0.80 | 0.34 | 0.270 |
| Oct. 12 | do | Beaver Oil Well Artesian flow | SE. 24-2-11-4 | ..... | ..... | ..... | 0.360*a* |
| Oct. 12 | do | do | do | 2.4 | 0.68 | 0.56 | 0.380 |
| Oct. 29 | do | do | do | 1.8 | 0.42 | 0.74 | 0.310 |
| June 14 | do | Coulee | SE. 14-2-11-4 | 5.0 | 2.10 | 0.76 | 1.600 |
| June 25 | do | do | do | ..... | ..... | ..... | Nil. |
| July 12 | do | do | do | ..... | ..... | ..... | " |
| July 23 | do | do | do | ..... | ..... | ..... | " |
| July 30 | do | do | do | 5.0 | 1.80 | 0.41 | 0.740 |
| Aug. 9 | do | do | do | ..... | ..... | ..... | Nil. |
| Aug. 17 | do | do | do | ..... | ..... | ..... | " |
| Aug. 27 | do | do | do | ..... | ..... | ..... | " |
| Sept. 3 | do | do | do | ..... | ..... | ..... | " |
| Sept. 17 | do | do | do | ..... | ..... | ..... | " |
| Sept. 23 | do | do | do | ..... | ..... | ..... | " |
| Oct. 6 | do | do | do | ..... | ..... | ..... | " |
| Oct. 12 | do | do | do | ..... | ..... | ..... | " |
| Oct. 21 | do | do | do | ..... | ..... | ..... | " |
| Oct. 29 | do | do | do | ..... | ..... | ..... | " |
| Mar. 20 | do | do | Sec. 19-2 11-4 | 6.0 | 2.40 | 0.37 | 0.880 |
| Mar. 20 | do | do | Sec. 30-2-10-4 | 10.0 | 13.40 | 0.70 | 9.360 |
| April 7 | do | do | Sec. 21-2-17-4 | 8.0 | 3.10 | 0.35 | 1.100 |
| April 27 | do | do | do | ..... | ..... | ..... | Nil. |
| May 25 | G. H. Whyte and W. H. Storey | do | do | ..... | ..... | ..... | " |
| June 21 | W. H. Storey | do | do | 5.0 | 1.70 | 0.39 | 0.670 |
| July 18 | do | do | do | ..... | ..... | ..... | Nil. |
| Aug. 4 | do | do | do | ..... | ..... | ..... | " |
| Aug. 23 | do | do | do | ..... | ..... | ..... | " |
| Sept. 9 | do | do | do | ..... | ..... | ..... | " |
| Sept. 29 | do | do | do | ..... | ..... | ..... | " |
| Oct. 17 | do | do | do | ..... | ..... | ..... | " |

*a* Weir measurement.

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Milk River drainage basin, in 1915.—*Continued.*

| Date. | Engineer. | Stream. | Location. | Width. | Area of Section. | Mean Velocity. | Discharge. |
|---|---|---|---|---|---|---|---|
| | | | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Sec.-ft.* |
| Mar. 29 | W. H. Storey | Dead Horse Creek | Sec. 4-2-11-4 | 6.0 | 2.70 | 0.80 | 2.170 |
| April 12 | do | do | do | 6.0 | 1.70 | 0.60 | 1.080 |
| April 22 | do | do | do | 2.2 | 0.42 | 0.55 | 0.230 |
| May 4 | do | do | do | | | | Nil. |
| May 19 | do | do | do | 3.0 | 1.04 | 0.49 | 0.510 |
| May 31 | G. H. Whyte and W. H. Storey | do | do | | | | Nil. |
| June 14 | W. H. Storey | do | do | 6.0 | 4.80 | 0.98 | 4.700 |
| June 25 | do | do | do | 5.0 | 4.30 | 0.71 | 3.000 |
| July 12 | do | do | do | 4.5 | 1.25 | 0.40 | 0.500 |
| July 22 | do | do | do | | | | 0.125*a* |
| July 30 | do | do | do | 8.0 | 2.60 | 1.27 | 3.300 |
| Aug. 9 | do | do | do | | | | Nil. |
| Aug. 17 | do | do | do | | | | " |
| Aug. 27 | do | do | do | | | | " |
| Sept. 3 | do | do | do | | | | 0.093*a* |
| Sept. 17 | do | do | do | 6.0 | 1.30 | 0.32 | 0.410 |
| Sept. 23 | do | do | do | | | | 0.018*a* |
| Oct. 6 | do | do | do | 6.0 | 1.40 | 0.32 | 0.450 |
| Oct. 12 | do | do | do | | | | 0.171*a* |
| Oct. 21 | do | do | do | | | | 0.171*a* |
| Oct. 29 | do | do | do | | | | 0.194*a* |
| Mar. 19 | do | Deer Creek | NE. 26-1-12-4 | 6.0 | 1.50 | 0.88 | 1.320 |
| Mar. 29 | do | do | do | 5.0 | 0.90 | 0.50 | 0.450 |
| April 12 | do | do | do | 6.0 | 1.90 | 0.58 | 1.100 |
| April 22 | do | do | do | 4.0 | 0.95 | 1.25 | 1.190 |
| May 4 | do | do | do | 3.2 | 1.03 | 0.61 | 0.630 |
| May 19 | do | do | do | 5.0 | 3.10 | 2.49 | 7.720 |
| June 15 | do | do | do | 12.0 | 8.90 | 0.67 | 6.000 |
| June 24 | do | do | do | 9.0 | 4.30 | 1.52 | 6.500 |
| July 12 | do | do | do | 8.0 | 2.50 | 1.04 | 2.600 |
| July 22 | do | do | do | 9.0 | 3.70 | 0.68 | 2.530 |
| July 30 | do | do | do | 11.5 | 7.70 | 0.71 | 5.500 |
| Aug. 8 | do | do | do | 6.0 | 2.30 | 0.75 | 1.730 |
| Aug. 17 | do | do | do | 5.0 | 1.50 | 0.48 | 0.720 |
| Aug. 26 | do | do | do | 7.0 | 2.10 | 0.35 | 0.730 |
| Sept. 3 | do | do | do | 7.0 | 2.00 | 0.44 | 0.890 |
| Sept. 16 | do | do | do | 3.5 | 1.17 | 0.54 | 0.630 |
| Sept. 23 | do | do | do | 5.0 | 2.00 | 0.31 | 0.610 |
| Oct. 5 | do | do | do | 8.0 | 3.00 | 0.48 | 1.430 |
| Oct. 12 | do | do | do | 7.0 | 1.60 | 0.51 | 0.810 |
| Oct. 20 | do | do | do | 7.0 | 1.70 | 0.49 | 0.830 |
| Oct. 29 | do | do | do | 5.0 | 1.40 | 0.62 | 0.870 |
| April 23 | do | Dickinson Ditch | SW. 15-1-12-4 | 2.9 | 0.90 | 0.47 | 0.420 |
| May 3 | do | do | do | | | | Nil. |
| June 15 | do | do | do | | | | " |
| June 24 | do | do | do | | | | " |
| July 22 | do | do | do | | | | 0.388*a* |
| Aug. 8 | do | do | do | | | | 0.109*a* |
| Aug. 18 | do | do | do | | | | 0.388*a* |
| Aug. 26 | do | do | do | | | | 0.288*a* |
| Sept. 4 | do | do | do | | | | 0.109*a* |
| Sept. 16 | do | do | do | | | | 0.148*a* |
| Sept. 24 | do | do | do | | | | 0.109*a* |
| Oct. 9 | do | do | do | | | | 0.093*a* |
| Oct. 13 | do | do | do | | | | 0.109*a* |
| Oct. 20 | do | do | do | | | | 0.125*a* |
| Mar. 18 | do | Davis Coulee | SE. 35-1-13-4 | | | | *b* |
| Mar. 30 | do | do | do | | | | Nil. |
| April 11 | do | do | do | | | | " |
| April 22 | do | do | do | | | | " |
| May 2 | do | do | do | | | | " |
| May 20 | do | do | do | | | | " |
| May 30 | G. H. Whyte and W. H. Storey | do | do | | | | " |
| June 15 | W. H. Storey | do | do | | | | " |
| June 23 | do | do | do | 7.0 | 2.90 | 0.37 | 1.080 |
| July 13 | do | do | do | | | | Nil. |
| July 21 | do | do | do | 4.0 | 0.60 | 0.27 | 0.160 |
| July 30 | do | do | do | | | | Nil. |
| Aug. 7 | do | do | do | 5.0 | 1.00 | 0.40 | 0.400 |
| Aug. 18 | do | do | do | | | | Nil. |
| Aug. 25 | do | do | do | | | | " |
| Sept. 4 | do | do | do | | | | " |
| Sept. 15 | do | do | do | | | | 0.061*a* |
| Sept. 24 | do | do | do | | | | Nil. |
| Oct. 2 | do | do | do | | | | " |
| Oct. 4 | do | do | do | | | | " |

*a* Weir measurements.
*b* Small trickle, too small to measure.

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Milk River drainage basin, in 1915. —*Continued.*

| Date. | Engineer. | Stream. | Location. | Width. | Area of Section. | Mean Velocity. | Discharge. |
|---|---|---|---|---|---|---|---|
| | | | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Sec.-ft.* |
| Oct. 13 | W. H. Storey | Davis Coulee | SE. 35-1-13-4 | | | | Nil. |
| Oct. 19 | do | do | do | | | | " |
| Oct. 30 | do | do | do | | | | " |
| May 3 | do | Spring at Drader Ranch | SE. 9-1-12-4 | | | | 0.011*a* |
| May 24 | do | do | do | | | | 0.011 |
| Aug. 8 | do | do | do | | | | 0.004*a* |
| Mar. 29 | do | Half-Breed Creek | Sec. 28-2-10-4 | 7.5 | 4.47 | 0.59 | 2.630 |
| April 12 | do | do | do | 7.0 | 2.90 | 0.54 | 2.060 |
| April 22 | do | do | do | 5.0 | 1.00 | 0.75 | 2.050 |
| May 4 | do | do | do | | | | 0.367*a* |
| May 19 | do | do | do | 10.5 | 4.35 | 0.66 | 3.520 |
| June 14 | do | do | do | 13.0 | 7.80 | 0.46 | 3.600 |
| June 25 | do | do | do | 24.0 | 13.20 | 0.80 | 10.600 |
| July 12 | do | do | do | 9.0 | 3.10 | 0.56 | 2.600 |
| July 23 | do | do | do | 11.0 | 4.20 | 0.66 | 4.020 |
| July 30 | do | do | do | 7.5 | 2.68 | 1.30 | 7.320 |
| Aug. 9 | do | do | do | | | | 2.600*a* |
| Aug. 17 | do | do | do | 6.0 | 1.30 | 0.42 | 0.540 |
| Aug. 27 | do | do | do | | | | 0.388*a* |
| Sept. 3 | do | do | do | | | | 0.061*a* |
| Sept. 17 | do | do | do | 6.0 | 1.60 | 0.39 | 0.620 |
| Sept. 23 | do | do | do | 4.5 | 1.90 | 0.30 | 0.570 |
| Oct. 6 | do | do | do | 7.0 | 1.70 | 0.40 | 0.960 |
| Oct. 12 | do | do | do | 7.5 | 1.85 | 0.35 | 0.910 |
| Oct. 21 | do | do | do | 5.0 | 1.30 | 0.66 | 0.860 |
| Oct. 29 | do | do | do | 5.0 | 1.06 | 0.89 | 1.000 |
| Mar. 25 | do | Kennedy Creek | SE. 3-1-5-4 | 10.5 | 8.37 | 0.62 | 5.220 |
| April 14 | do | do | do | | | | Nil. |
| April 15 | do | do | do | | | | " |
| April 20 | do | do | do | | | | " |
| May 6 | do | do | do | | | | " |
| June 2 | G. H. Whyte and W. H. Storey | do | do | | | | " |
| June 11 | W. H. Storey | do | do | | | | " |
| June 28 | do | do | do | 10.5 | 6.82 | 0.67 | 4.600 |
| July 26 | do | do | do | | | | Nil. |
| Aug. 12 | do | do | do | | | | " |
| Aug. 30 | do | do | do | | | | " |
| Sept. 20 | do | do | do | | | | " |
| Oct. 8 | do | do | do | | | | " |
| Oct. 27 | do | do | do | | | | " |
| Mar. 25 | do | Lost River | Sec. 11-2-5-4 | 12.0 | 7.40 | 0.67 | 4.930 |
| May 4 | do | Macdonald Creek | Sec. 32-1-11-4 | | | | 0.138*a* |
| May 19 | do | do | do | 5.0 | 1.60 | 0.40 | 0.640 |
| June 14 | do | do | do | 8.0 | 3.90 | 0.51 | 2.000 |
| June 25 | do | do | do | 8.0 | 4.10 | 0.55 | 2.270 |
| July 12 | do | do | do | 4.0 | 1.20 | 0.78 | 0.940 |
| July 22 | do | do | do | | | | 0.171*a* |
| July 30 | do | do | do | 8.0 | 3.00 | 0.48 | 1.440 |
| Aug. 9 | do | do | do | | | | Nil. |
| Aug 17 | do | do | do | | | | " |
| Aug. 26 | do | do | do | | | | " |
| Sept. 3 | do | do | do | | | | 0.125*a* |
| Sept. 17 | do | do | do | 4.0 | 0.80 | 0.31 | 0.250 |
| Sept. 23 | do | do | do | | | | 0.027*a* |
| Oct. 6 | do | do | do | 5.0 | 1.10 | 0.32 | 0.350 |
| Oct. 12 | do | do | do | | | | 0.171*a* |
| Oct. 21 | do | do | do | | | | 0.148*a* |
| Oct. 29 | do | do | do | | | | 0.171*a* |
| April 6 | do | Mackie Creek | Sec. 19-2-18-4 | 4.0 | 1.40 | 0.57 | 0.800 |
| April 28 | do | do | do | 5.0 | 1.30 | 0.48 | 0.620 |
| June 21 | do | do | do | 6.0 | 2.70 | 0.73 | 1.960 |
| July 18 | do | do | do | 12.0 | 7.40 | 0.56 | 4.200 |
| Aug. 4 | do | do | do | 11.5 | 6.30 | 0.54 | 3.400 |
| Aug. 24 | do | do | do | 10.5 | 4.90 | 0.54 | 2.650 |
| Sept. 9 | do | do | do | 6.0 | 2.50 | 0.96 | 2.400 |
| Sept 29 | do | do | do | 8.0 | 3.80 | 0.66 | 2.500 |
| Oct. 17 | do | do | do | 7.5 | 3.55 | 0.69 | 2.400 |
| Mar. 29 | do | Miners Creek | Sec. 10-2-11 4 | 6.0 | 2.80 | 0.76 | 2.120 |
| April 12 | do | do | do | 7.0 | 2.50 | 0.60 | 1.520 |
| April 22 | do | do | do | 4.2 | 1.58 | 0.51 | 0.810 |
| May 4 | do | do | do | | | | 0.229*a* |
| May 19 | do | do | do | 9.0 | 5.00 | 0.78 | 3.920 |
| May 31 | G. H. Whyte and W. H. Storey | do | do | | | | *b* |
| June 14 | W. H. Storey | do | do | 12.0 | 9.40 | 0.92 | 8.700 |
| June 25 | do | do | do | 9.0 | 7.10 | 0.70 | 5.000 |
| July 12 | do | do | do | 7.0 | 3.20 | 0.80 | 2.600 |

*a* Weir measurement.
*b* Small trickle, too small to measure.

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Milk River drainage basin, in 1915.
—*Continued.*

| Date. | Engineer. | Stream. | Location. | Width. | Area of Section. | Mean Velocity. | Discharge. |
|---|---|---|---|---|---|---|---|
| | | | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Sec.-ft.* |
| July 23 | W. H. Storey | Miners Creek | Sec. 10-2-11-4 | 7.0 | 3.60 | 0.85 | 3.060 |
| July 30 | do | do | do | 9.0 | 5.00 | 1.44 | 7.200 |
| Aug. 9 | do | do | do | 7.0 | 2.90 | 0.75 | 2.200 |
| Aug. 17 | do | do | do | 4.5 | 0.89 | 0.39 | 0.350 |
| Aug. 27 | do | do | do | ..... | ..... | ..... | 0.288*a* |
| Sept. 3 | do | do | do | ..... | ..... | ..... | 0.125*a* |
| Sept. 17 | do | do | do | 6.0 | 1.70 | 0.42 | 0.720 |
| Sept. 23 | do | do | do | 5.0 | 1.00 | 0.36 | 0.360 |
| Oct. 6 | do | do | do | 7.0 | 2.00 | 0.47 | 0.930 |
| Oct. 12 | do | do | do | 6.0 | 2.10 | 1.00 | 2.110 |
| Oct. 21 | do | do | do | 5.5 | 1.83 | 0.58 | 1.070 |
| Oct. 29 | do | do | do | 5.0 | 1.40 | 0.84 | 1.170 |
| Mar. 13 | do | Police Creek | SW. 35-1-13-4 | 5.5 | 2.22 | 1.15 | 2.560 |
| Mar. 17 | do | do | do | 9.0 | 5.20 | 1.47 | 7.640 |
| Oct. 30 | do | do | do | 6.5 | 2.72 | 0.52 | 1.420 |
| April 2 | do | do | do | 10.0 | 7.50 | 0.80 | 6.050 |
| April 11 | do | do | do | 7.0 | 3.00 | 0.51 | 1.540 |
| April 23 | do | do | do | 6.0 | 1.75 | 0.46 | 0.800 |
| May 2 | do | do | do | 5.0 | 0.65 | 0.35 | 0.220 |
| May 20 | do | do | do | 4.0 | 0.90 | 0.29 | 0.260 |
| May 29 | G. H. Whyte and W. H. Storey | do | do | ..... | ..... | ..... | 0.12[illegible] |
| June 15 | W. H. Storey | do | do | 13.0 | 15.00 | 0.51 | 7.600 |
| June 23 | do | do | do | 11.5 | 5.50 | 0.45 | 2.500 |
| July 13 | do | do | do | 8.0 | 3.20 | 0.52 | 1.680 |
| July 21 | do | do | do | 8.0 | 2.90 | 0.51 | 1.470 |
| July 30 | do | do | do | 12.0 | 7.50 | 0.56 | 4.200 |
| Aug. 7 | do | do | do | 9.0 | 4.20 | 0.57 | 2.400 |
| Aug. 18 | do | do | do | 4.0 | 0.70 | 0.40 | 0.280 |
| Aug. 25 | do | do | do | 5.0 | 1.34 | 0.42 | 0.560 |
| Sept. 4 | do | do | do | 6.0 | 2.30 | 0.54 | 1.240 |
| Sept. 15 | do | do | do | 6.5 | 1.87 | 0.65 | 1.210 |
| Sept. 24 | do | do | do | ..... | ..... | ..... | 0.240*a* |
| Oct. 2 | do | do | do | 6.0 | 1.30 | 0.44 | 0.570 |
| Oct. 4 | do | do | do | 6.5 | 2.30 | 0.60 | 1.390 |
| Oct. 13 | do | do | SE. 3-1-13-4 | 5.0 | 2.50 | 0.99 | 2.500 |
| Oct. 13 | do | do | SW. 35-1-13-4 | 9.0 | 3.10 | 0.46 | 1.430 |
| Oct. 19 | do | do | do | 9.0 | 2.90 | 0.43 | 1.240 |
| Oct. 30 | do | do | do | 6.0 | 1.60 | 0.44 | 0.700 |
| Mar. 16 | do | Red Creek | Sec. 18-1-15-4 | 11.0 | 5.90 | 1.26 | 7.430 |
| April 10 | do | do | do | 4.0 | 0.70 | 0.30 | 0.210 |
| May 1 | do | do | do | 4.0 | 0.80 | 0.29 | 0.230 |
| May 21 | do | do | do | ..... | ..... | ..... | Nil. |
| June 16 | do | do | do | ..... | ..... | ..... | " |
| June 22 | do | do | do | ..... | ..... | ..... | " |
| July 14 | do | do | do | ..... | ..... | ..... | " |
| Aug. 1 | do | do | do | ..... | ..... | ..... | " |
| Sept. 5 | do | do | do | ..... | ..... | ..... | " |
| Sept. 25 | do | do | Sec 35-1-15-4 | ..... | ..... | ..... | " |
| Oct. 1 | do | do | do | ..... | ..... | ..... | " |
| Oct. 14 | do | do | do | ..... | ..... | ..... | " |
| Oct. 19 | do | do | do | ..... | ..... | ..... | " |
| Oct. 31 | do | do | do | ..... | ..... | ..... | Nil |
| Mar. 13 | do | Rocky Coulee | SW. 35-1-13-4 | 5.0 | 1.90 | 0.79 | 1.500 |
| Mar. 17 | do | do | do | 7.0 | 2.50 | 0.85 | 2.120 |
| Mar. 30 | do | do | do | ..... | ..... | ..... | Nil. |
| April 11 | do | do | do | ..... | ..... | ..... | " |
| April 23 | do | do | do | ..... | ..... | ..... | " |
| May 2 | do | do | do | ..... | ..... | ..... | " |
| May 20 | do | do | do | ..... | ..... | ..... | " |
| May 30 | G. H. Whyte and W. H. Storey | do | do | ..... | ..... | ..... | " |
| June 15 | W. H. Storey | do | do | 7.0 | 2.90 | 0.41 | 1.180 |
| June 23 | do | do | do | ..... | ..... | ..... | 0.151*a* |
| July 13 | do | do | do | 5.0 | 1.20 | 0.41 | 0.490 |
| July 21 | do | do | do | ..... | ..... | ..... | Nil |
| July 30 | do | do | do | 6.0 | 2.30 | 0.60 | 1.390 |
| Aug. 7 | do | do | do | ..... | ..... | ..... | Nil. |
| Aug. 18 | do | do | do | ..... | ..... | ..... | " |
| Aug. 25 | do | do | do | ..... | ..... | ..... | " |
| Sept. 4 | do | do | do | ..... | ..... | ..... | 0.148*a* |
| Sept. 15 | do | do | do | ..... | ..... | ..... | 0.109*a* |
| Sept. 24 | do | do | do | ..... | ..... | ..... | Nil |
| Oct. 2 | do | do | do | ..... | ..... | ..... | " |
| Oct. 4 | do | do | do | ..... | ..... | ..... | " |
| Oct. 13 | do | do | do | ..... | ..... | ..... | " |
| Oct. 19 | do | do | do | ..... | ..... | ..... | " |
| Oct. 30 | do | do | do | ..... | ..... | ..... | " |
| Aug. 17 | H. R. Carscallen | Sage Creek | NW. 15-1-2-4 | 9.00 | 53.83 | 0.88 | 47.[illegible] |

*a* Weir measurement.

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Milk River drainage basin, in 1915. —*Concluded.*

| Date. | Engineer. | Stream. | Location. | Width. | Area of Section. | Mean Velocity. | D's-charge. |
|---|---|---|---|---|---|---|---|
| | | | | *Feet.* | *Sq ft.* | *Ft. per sec.* | *Sec.-ft.* |
| May 4 | W. H. Storey | Sims' Ditch | SE. 31-1-11-4 | | | | 0.138*a* |
| May 19 | do | do | do | 4.5 | 1.32 | 0.39 | 0.510 |
| June 14 | do | do | do | | | | Nil. |
| June 25 | do | do | do | | | | " |
| July 12 | do | do | do | 4.0 | 1.30 | 0.39 | 0.510 |
| July 22 | do | do | do | | | | Nil. |
| July 30 | do | do | do | | | | " |
| Aug. 9 | do | do | do | | | | " |
| Aug. 17 | do | do | do | | | | " |
| Aug. 27 | do | do | do | | | | " |
| Sept. 3 | do | do | do | | | | " |
| Sept. 17 | do | do | do | | | | " |
| Sept. 23 | do | do | do | | | | " |
| Oct. 6 | do | do | do | | | | " |
| Oct. 12 | do | do | do | | | | " |
| Oct 21 | do | do | do | | | | " |
| Oct. 29 | do | do | do | | | | Nil. |
| Mar. 29 | do | Spring Creek | SW. 31-1-11-4 | 5.5 | 2.10 | 0.56 | 1.180 |
| April 12 | do | do | do | 5.0 | 1.00 | 0.48 | 0.480 |
| May 4 | do | do | do | | | | Nil. |
| May 19 | do | do | do | 4.0 | 0.85 | 0.32 | 0.260 |
| June 14 | do | do | do | 6.0 | 3.50 | 0.83 | 2.900 |
| June 25 | do | do | do | 5.0 | 2.00 | 0.37 | 0.740 |
| July 12 | do | do | do | 4.5 | 1.25 | 0.48 | 0.600 |
| July 22 | do | do | do | | | | 0.360*a* |
| July 30 | do | do | do | 6.0 | 2.40 | 0.66 | 1.580 |
| Aug. 9 | do | do | do | | | | 0.360*a* |
| Aug. 17 | do | do | do | 4.0 | 0.85 | 0.41 | 0.350 |
| Aug. 27 | do | do | do | | | | 0.240*a* |
| Sept. 3 | do | do | do | | | | 0.171*a* |
| Sept. 16 | do | do | do | 4.0 | 0.80 | 0.31 | 0.250 |
| Sept. 23 | do | do | do | 4.0 | 0.70 | 0.20 | 0.140 |
| Oct. 6 | do | do | do | 4.0 | 0.90 | 0.31 | 0.280 |
| Oct. 12 | do | do | do | | | | 0.148*a* |
| Oct. 21 | do | do | do | 3.0 | 0.60 | 0.22 | 0.130 |
| Oct. 29 | do | do | do | | | | 0.045*a* |
| Mar. 12 | do | Verdigris Coulee | SE. 29-2-14-4 | | | | Nil. |
| Mar. 14 | do | do | do | 6.50 | 3.00 | 0.72 | 2.160 |
| April 2 | do | do | do | 4.50 | 0.85 | 0.39 | 0.330 |
| April 24 | do | do | do | | | | Nil. |
| July 20 | do | do | do | | | | " |
| Aug. 6 | do | do | do | | | | " |
| Aug. 19 | do | do | do | | | | " |
| Aug. 25 | do | do | do | | | | " |
| Sept. 13 | do | do | do | | | | 0.148*a* |
| Mar. 13 | do | Deer Creek | SW. 15-1-12-4 | 7.5 | 4.12 | 0.65 | 2.700 |
| Mar. 19 | do | do | do | 6.0 | 1.40 | 0.91 | 1.270 |
| April 22 | do | do | do | 6.0 | 1.90 | 0.98 | 1.870 |
| May 3 | do | do | do | 4.7 | 1.17 | 0.82 | 0.960 |
| June 25 | do | Ditch on Fornfeist Ranch | NW. 30-1-11-4 | | | | Nil. |
| July 22 | do | do | Sec. 31-1-11-4 | | | | 0.360*a* |
| July 30 | do | do | do | | | | Nil. |
| Aug. 9 | do | do | do | | | | 0.388*a* |
| Aug. 17 | do | do | do | 5.0 | 0.81 | 0.37 | 0.300 |
| Aug. 26 | do | do | do | | | | 0.217*a* |
| Sept. 3 | do | do | do | | | | Nil. |
| April 12 | do | Ditch at Hall's Ranch | SE. 28-2-10-4 | 3.0 | 1.15 | 0.43 | 0.490 |
| April 22 | do | do | do | 3.9 | 1.49 | 0.87 | 1.300 |
| May 4 | do | do | do | | | | Nil |
| | do | do | do | 3.2 | 1.08 | 0.60 | 0.650 |
| May 19 | do | do | do | | | | Nil. |
| June 14 | do | do | do | | | | " |
| June 25 | do | do | do | 4.0 | 1.55 | 0.55 | 0.860 |
| July 12 | do | do | do | 4.3 | 2.06 | 0.61 | 1.250 |
| July 23 | do | do | do | 3.8 | 1.98 | 1.93 | 3.800 |
| July 30 | do | do | do | 3.8 | 1.42 | 1.46 | 2.100 |
| Aug. 9 | do | do | do | | | | Nil |
| Aug. 17 | do | do | do | | | | " |
| Aug. 27 | do | do | do | | | | " |
| Sept. 3 | do | do | do | | | | " |
| Sept. 17 | do | do | do | | | | " |
| Sept. 23 | do | do | do | 4.5 | 0.85 | 0.33 | 0.280 |
| Oct. 6 | do | do | do | 4.5 | 0.85 | 0.31 | 0.260 |
| Oct. 12 | do | do | do | | | | Nil. |
| Oct. 21 | do | do | do | 3.0 | 0.29 | 0.22 | 0.060 |
| Oct. 29 | | | | | | | |

*a* Weir measurement.

## PAKOWKI LAKE DRAINAGE BASIN.

### *General Description.*

Pakowki Lake receives the drainage of the western slopes of the Cypress Hills, and a fair amount of water from the northern slopes of the Milk River Ridge. It also receives, via Etzikom Coulee, a certain amount of waste water from the Alberta Railway and Irrigation Company's canals. There is no outlet to this lake, the water level being about thirty feet lower than that of Milk River in Range 8, West of the 4th Meridian.

The streams within this drainage basin are very similar in their general characteristics, all having narrow, deep, and well defined valleys, with a growth of willows along the bottoms. Most of these creeks on the east side of the lake have considerable flats and meadows, covered with native grasses and sage brush, and are to a great extent irrigated from these creeks. During exceptionally heavy rainfall these creeks are subject to rapid rises and correspondingly rapid falls of stage. Canal Creek and the south branch of Manyberries Creek drain a considerable area of broken land, devoid of tilth, and the run-off from these creeks, contributed by deep coulees where the subsoil is exposed, is comparatively large, almost all the precipitation finding its way into the creek channels.

There are several irrigation works situated on Manyberries, Ketchum and Canal Creeks, all the water coming down from the higher ground, except during a very large run-off, being used in irrigating the lower flats, very little water being discharged into Pakowki Lake.

The yield of cultivated hays of different kinds, native hay and alfalfa, has been considerably increased by the use of these waters.

### ETZIKOM COULEE NEAR STIRLING.

*Location.*—On road allowance between SW. ¼ Sec. 3, and SE. ¼ Sec. 4, Tp. 7, Rge. 19, W. 4th Mer., at highway bridge, one mile north and east of Stirling.

*Records available.*—May 1, 1914, to Sept. 26, 1915.

*Drainage area.*—The run-off of this coulee was partly from its drainage area, but largely from the overflow of the Alberta Railway and Irrigation Company's irrigation ditch.

*Gauge.*—Vertical staff fastened to bridge pile on downstream side against north abutment. Elevation of zero maintained at 92.83 feet, since establishment.

*Bench-mark.*—Permanent iron bench-mark located 25 feet east of south end of bridge. Assumed elevation, 100.00 feet.

*Channel.*—Composed of clay and liable to be affected by the growth of weeds in bed.

*Discharge measurements.*—Owing to continuous high water in 1915 all measurements were made by wading. At low water stage a weir could be used, and at extreme high water measurements could be made from the traffic bridge.

*Observers.*—F. Adler (discontinued his observations Aug. 12, 1915). Nels H. Nelson (commenced making observations on Aug. 13, 1915).

DISCHARGE MEASUREMENTS of Etzikom Coulee near Stirling, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 8 | W. H. Storey | 30.5 | 62.00 | 1.45 | 3.95 | 90.00 |
| April 29 | do | 2.3 | 1.14 | 0.35 | 1.58 | 0.40 |
| May 26 | W. R. McCaffrey | 11.0 | 7.90 | 0.76 | 1.94 | 6.10 |
| July 14 | do | 17.0 | 15.90 | 0.97 | 2.39 | 15.40 |
| July 26 | do | 17.0 | 18.00 | 1.25 | 2.57 | 22.00 |
| Aug. 12 | G. H. Whyte and W. R. McCaffrey | 11.8 | 11.01 | 1.22 | 2.07 | 9.00 |
| Aug. 25 | W. R. McCaffrey | 11.0 | 11.10 | 1.00 | 2.10 | 11.00 |
| Sept. 20 | do | 12.0 | 11.20 | 1.05 | 2.17 | 11.80 |

DAILY GAUGE HEIGHT AND DISCHARGE of Etzikom Coulee near Stirling, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 3.07 | 39.40 | 1.52 | 0.11 | 1.77 | 2.92 |
| 2 | ..... | ..... | 3.07 | 39.40 | 1.50 | 0.05 | 1.82 | 3.76 |
| 3 | ..... | ..... | 3.07 | 39.40 | 1.50 | 0.05 | 2.14 | 10.66 |
| 4 | ..... | ..... | 3.40 | 53.90 | 2.20 | 12.10 | 2.99 | 36.20 |
| 5 | ..... | ..... | 3.15 | 42.70 | 1.93 | 5.90 | 3.40 | 53.90 |
| 6 | ..... | ..... | 3.03 | 37.80 | 2.13 | 10.42 | 3.25 | 47.00 |
| 7 | ..... | ..... | 2.85 | 30.90 | 1.65 | 1.20 | 3.10 | 40.60 |
| 8 | ..... | ..... | 2.43 | 17.78 | 1.70 | 1.90 | 2.72 | 26.38 |
| 9 | ..... | ..... | 2.91 | 33.08 | 1.72 | 2.18 | 2.68 | 25.06 |
| 10 | ..... | ..... | 2.62 | 23.20 | 1.69 | 1.76 | 2.25 | 13.30 |
| 11 | ..... | ..... | 2.28 | 14.02 | 1.68 | 1.62 | 2.10 | 9.70 |
| 12 | ..... | ..... | 2.20 | 12.10 | 1.72 | 2.18 | 2.07 | 8.98 |
| 13 | ..... | ..... | 2.20 | 12.10 | 1.73 | 2.32 | 2.05 | 8.50 |
| 14 | ..... | ..... | 2.00 | 7.40 | 1.74 | 2.46 | 2.05 | 8.50 |
| 15 | ..... | ..... | 2.00 | 7.40 | 2.35 | 15.70 | 2.02 | 7.84 |
| 16 | 1.86 | 4.50 | 2.00 | 7.40 | 2.52 | 20.26 | 2.02 | 7.84 |
| 17 | 2.01 | 7.62 | 2.01 | 7.62 | 2.40 | 17.00 | 1.87 | 4.70 |
| 18 | 3.40 | 53.90 | 2.05 | 8.50 | 2.38 | 16.48 | 1.84 | 4.12 |
| 19 | 6.52 | 314.36*a* | 2.03 | 8.06 | 2.32 | 14.98 | 2.70 | 25.70 |
| 20 | 6.50 | 312.60*a* | 2.00 | 7.40 | 2.50 | 19.70 | 2.71 | 26.04 |
| 21 | 6.45 | 308.20*b* | 1.95 | 6.30 | 2.85 | 30.90 | 2.16 | 11.14 |
| 22 | 4.90 | 171.80 | 1.96 | 6.52 | 2.67 | 21.74 | 3.00 | 36.60 |
| 23 | 4.35 | 123.40 | 1.94 | 6.10 | 2.51 | 19.98 | 2.75 | 27.40 |
| 24 | 3.95 | 88.40 | 1.90 | 5.30 | 2.26 | 13.54 | 2.02 | 7.84 |
| 25 | 3.80 | 77.00 | 1.90 | 5.30 | 2.05 | 8.50 | 2.00 | 7.40 |
| 26 | 3.78 | 75.64 | 1.86 | 4.50 | 1.94 | 6.10 | 3.66 | 68.00 |
| 27 | 3.74 | 72.96 | 2.05 | 8.50 | 1.87 | 4.70 | 3.70 | 70.40 |
| 28 | 3.30 | 49.30 | 1.78 | 3.08 | 1.85 | 4.30 | 3.40 | 53.90 |
| 29 | 3.15 | 42.70 | 1.58 | 0.44 | 1.84 | 4.12 | 3.30 | 49.30 |
| 30 | 3.13 | 41.86 | 1.55 | 0.20 | 1.80 | 3.40 | 3.21 | 45.24 |
| 31 | 3.10 | 40.60 | ..... | ..... | 1.77 | 2.92 | ..... | ..... |

NOTE—Sudden fluctuations of gauge height and discharge due to strong winds blowing water down from 18-Mile Lake.

*a* Partial ice, water flooding over ice.

*b* Ice breaking up.

DAILY GAUGE HEIGHT AND DISCHARGE of Etzikom Coulee near Stirling, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.15 | 42.70 | 2.55 | 21.10 | 1.95*b* | 6.30 |
| 2 | 3.07 | 39.40 | 2.56 | 21.40 | 1.95 | 6.30 |
| 3 | 3.02 | 37.40 | 2.60 | 22.60 | 2.42 | 17.52 |
| 4 | 3.05 | 38.60 | 2.58 | 22.00 | 2.25 | 13.30 |
| 5 | 3.05 | 38.60 | 2.55 | 21.10 | 2.10 | 9.70 |
| 6 | 3.05 | 38.60 | 2.55 | 21.10 | 2.15 | 10.90 |
| 7 | 3.30 | 49.30 | 2.46 | 18.58 | 2.18 | 11.62 |
| 8 | 3.21 | 45.24 | 2.47 | 18.86 | 2.18 | 11.62 |
| 9 | 3.05 | 38.60 | 2.44 | 18.04 | 2.10 | 9.70 |
| 10 | 2.96 | 35.00 | 2.43 | 17.78 | 2.10*b* | 9.70 |
| 11 | 2.66 | 24.42 | 2.43 | 17.78 | 2.09 | 9.46 |
| 12 | 2.50 | 19.70 | 2.05 | 8.50 | 2.05 | 8.50 |
| 13 | 2.45 | 18.30 | 2.12*c* | 10.18 | 2.05 | 8.50 |
| 14 | 2.38 | 16.48 | 2.40 | 17.00 | 2.05 | 8.50 |
| 15 | 2.28 | 14.02 | 2.40 | 17.00 | 1.93 | 5.90 |
| 16 | 2.27 | 13.78 | 2.40 | 17.00 | 2.12 | 10.18 |
| 17 | 2.36 | 15.96 | 2.50 | 19.70 | 2.15 | 10.90 |
| 18 | 2.50 | 19.70 | 1.95 | 6.30 | 2.28 | 14.02 |
| 19 | 2.50 | 19.70 | 2.25 | 13.30 | 2.15 | 10.90 |
| 20 | 2.54 | 20.82 | 2.50 | 19.70 | 2.25 | 13.20 |
| 21 | 2.56 | 21.40 | 2.30 | 14.50 | 2.25 | 13.30 |
| 22 | 2.53 | 20.54 | 2.25 | 13.30 | 2.15 | 10.90 |
| 23 | 2.57 | 21.70 | 2.40 | 17.00 | 2.23 | 12.82 |
| 24 | 2.58 | 22.00 | 2.25 | 13.30 | 2.30 | 14.50 |
| 25 | 2.60 | 22.60 | 2.16 | 11.14 | 2.25 | 13.30 |
| 26 | 2.57 | 21.70 | 2.15 | 10.90 | 2.17 | 11.38 |
| 27 | 2.38 | 16.48 | 2.09 | 9.46 | 4.05*a* | ..... |
| 28 | 2.48 | 19.14 | 2.04 | 8.28 | 5.25 | ..... |
| 29 | 2.54 | 20.82 | 2.02 | 7.84 | 5.73 | ..... |
| 30 | 2.56 | 21.40 | 1.75 | 2.60 | 5.60 | ..... |
| 31 | 2.53 | 20.54 | 1.95 | 6.30 | ..... | ..... |

*a* Coulee dammed below gauge, changing control, hence former discharge curve is not applicable to gauge heights from this date.
*b* Interpolated.
*c* Change in observers.

MONTHLY DISCHARGE of Etzikom Coulee near Stirling, for 1915.

(Drainage area 203 square miles.) *b*

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | |
| March (16-31) | 314.0 | 4.50 | 112.0 | 3,554 |
| April | 54.0 | 0.20 | 16.5 | 982 |
| May | 31.0 | 0.05 | 8.7 | 532 |
| June | 54.0 | 2.92 | 25.0 | 1,488 |
| July | 49.0 | 13.80 | 24.0 | 1,476 |
| August | 23.0 | 2.60 | 14.5 | 892 |
| September (1-26) | 17.5 | 5.90 | 10.9 | 562 |
| The period | | | | 9,486*a* |

*a* Mostly irrigation water, overflow from 18-Mile Lake.
*b* Drainage area cannot be considered in monthly discharge computations.

ETZIKOM COULEE NEAR GODDARD.

*Location.*—On SW. ¼ Sec. 2, Tp. 5, Rge. 13, W. 4th Mer., at outlet of Crow Indian Lake.
*Records available.*—May 28, 1915, to October 31, 1915.
*Gauge.*—Vertical staff. Maintained at zero elevation of 96.31 feet since establishment.
*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.
*Channel.*—Gravel and sand, not liable to change.
*Discharge measurements.*—Made by wading.
*Observer.*—Wm. Rutherford.
*Note.*—Station established May 28, 1915, by W. H. Storey.

DISCHARGE MEASUREMENTS of Etzikom Coulee near Goddard, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 29 | G. H. Whyte and W.H.Storey | ..... | ..... | ..... | 0.53 | 0.514*a* |
| July 20 | W. H. Storey | 4.9 | 3.80 | 1.14 | 1.22 | 4.300 |
| Aug. 6 | do | 15.5 | 14.85 | 0.36 | 1.28 | 5.300 |
| Sept. 14 | do | 5.3 | 3.36 | 1.30 | 1.11 | 4.400 |
| Oct. 3 | do | 6.5 | 3.80 | 1.39 | 1.11 | 5.300 |

*a* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Etzikom Coulee near Goddard, for 1915.

| Day. | May. | | June. | | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft* |
| 1 | ..... | ..... | 0.59 | 0.51 | 0.50 | 0.30 | 1.35 | 6.2 | 1.02 | 3.1 | 1.06 | 4.5 |
| 2 | ..... | ..... | 0.75 | 1.02 | 0.49 | 0.28 | 1.34 | 6.1 | 1.02 | 3.1 | 1.14 | 5.6 |
| 3 | ..... | ..... | 0.80 | 1.21 | 0.45 | 0.21 | 1.34 | 6.1 | 1.02 | 3.1 | 1.11 | 5.2 |
| 4 | ..... | ..... | 0.65 | 0.68 | 0.45 | 0.21 | 1.32 | 5.8 | 1.01 | 3.1 | 1.11 | 5.2 |
| 5 | ..... | ..... | 0.75 | 1.02 | 0.50 | 0.30 | 1.30 | 5.5 | 1.00 | 3.0 | 1.12 | 5.3 |
| 6 | ..... | ..... | 0.61 | 0.56 | 0.60 | 0.53 | 1.28 | 5.2 | 1.00 | 3.0 | 1.11 | 5.2 |
| 7 | ..... | ..... | 0.61 | 0.56 | 0.70 | 0.82 | 1.25 | 4.9 | 1.00 | 3.1 | 1.10 | 5.0 |
| 8 | ..... | ..... | 0.62 | 0.59 | 0.80 | 1.21 | 1.25 | 4.9 | 1.02 | 3.3 | 1.10 | 5.0 |
| 9 | ..... | ..... | 0.64 | 0.65 | 0.90 | 1.70 | 1.25 | 4.9 | 1.05 | 3.6 | 1.10 | 5.0 |
| 10 | ..... | ..... | 0.55 | 0.42 | 1.05 | 2.70 | 1.24 | 4.9 | 1.05 | 3.6 | 1.15 | 5.8 |
| 11 | ..... | ..... | 0.54 | 0.39 | 1.05 | 2.70 | 1.24 | 4.9 | 1.05 | 3.7 | 1.20 | 6.6 |
| 12 | ..... | ..... | 0.54 | 0.39 | 1.00 | 2.30 | 1.23 | 4.8 | 1.07 | 3.9 | 1.19 | 6.4 |
| 13 | ..... | ..... | 0.54 | 0.39 | 1.00 | 2.30 | 1.21 | 4.5 | 1.09 | 4.1 | 1.15 | 5.8 |
| 14 | ..... | ..... | 0.54 | 0.39 | 1.05 | 2.70 | 1.20 | 4.5 | 1.11 | 4.4 | 1.14 | 5.6 |
| 15 | ..... | ..... | 0.60 | 0.53 | 1.05 | 2.70 | 1.20 | 4.5 | 1.05 | 3.8 | 1.12 | 5.3 |
| 16 | ..... | ..... | 0.55 | 0.42 | 1.09 | 3.00 | 1.19 | 4.4 | 1.06 | 3.9 | 1.13 | 5.5 |
| 17 | ..... | ..... | 0.74 | 0.98 | 1.14 | 3.50 | 1.20 | 4.7 | 1.06 | 3.9 | 1.15 | 5.8 |
| 18 | ..... | ..... | 0.50 | 0.30 | 1.20 | 4.10 | 1.19 | 4.5 | 1.05 | 3.9 | 1.15 | 5.8 |
| 19 | ..... | ..... | 0.60 | 0.53 | 1.20 | 4.10 | 1.18 | 4.4 | 1.06 | 4.0 | 1.10 | 5.0 |
| 20 | ..... | ..... | 0.62 | 0.59 | 1.22 | 4.40 | 1.15 | 4.0 | 1.05 | 3.9 | 1.10 | 5.0 |
| 21 | ..... | ..... | 0.56 | 0.44 | 1.22 | 4.40 | 1.15 | 4.1 | 1.05 | 4.0 | 1.09 | 4.9 |
| 22 | ..... | ..... | 0.56 | 0.44 | 1.23 | 4.50 | 1.16 | 4.2 | 1.05 | 4.0 | 1.09 | 4.9 |
| 23 | ..... | ..... | 0.54 | 0.39 | 1.24 | 4.70 | 1.15 | 4.1 | 1.06 | 4.1 | 1.09 | 4.9 |
| 24 | ..... | ..... | 0.50 | 0.30 | 1.25 | 4.80 | 1.14 | 4.1 | 1.10 | 4.8 | 1.10 | 5.0 |
| 25 | ..... | ..... | 0.56 | 0.44 | 1.25 | 4.80 | 1.12 | 3.9 | 1.05 | 4.1 | 1.12 | 5.3 |
| 26 | ..... | ..... | 0.55 | 0.42 | 1.25 | 4.80 | 1.10 | 3.7 | 1.01 | 4.7 | 1.25 | 7.4 |
| 27 | ..... | ..... | 0.54 | 0.39 | 1.25 | 4.80 | 1.09 | 3.6 | 1.05 | 4.2 | 1.10 | 5.0 |
| 28 | 0.54 | 0.39 | 0.54 | 0.39 | 1.28 | 5.20 | 1.08 | 3.6 | 1.05 | 4.2 | 1.10 | 5.0 |
| 29 | 0.56 | 0.44 | 0.54 | 0.39 | 1.40 | 7.00 | 1.05 | 3.3 | 1.05 | 4.2 | 1.10 | 5.0 |
| 30 | 0.47 | 0.25 | 0.52 | 0.35 | 1.40 | 7.00 | 1.04 | 3.2 | 1.04 | 4.2 | 1.25 | 7.4 |
| 31 | 0.48 | 0.26 | ..... | ..... | 1.39 | 6.80 | 1.02 | 3.1 | ..... | ..... | 1.26 | 7.6 |

MONTHLY DISCHARGE of Etzikom Coulee near Goddard, for 1915.

(Drainage area 714 square miles.)

| MONTH | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet |
| May (28-31) | 0.44 | 0.25 | 0.33 | 0.0005 | 0.0007 | 3 |
| June | 1.21 | 0.30 | 0.54 | 0.0008 | 0.0009 | 32 |
| July | 7.00 | 0.21 | 3.20 | 0.0045 | 0.0052 | 197 |
| August | 6.20 | 3.10 | 4.50 | 0.0063 | 0.0073 | 277 |
| September | 4.80 | 3.00 | 3.80 | 0.0053 | 0.0059 | 226 |
| October | 7.60 | 4.50 | 5.50 | 0.0077 | 0.0089 | 338 |
| The period | ..... | ..... | ..... | ..... | 0.0289 | 1,073 |

MANYBERRIES CREEK AT HOOPER AND HUCKVALE RANCH.

*Location.*—On the SW. ¼ Sec. 27, Tp. 4, Rge. 6, W. 4th Mer.

*Records available.*—April 1, 1911, to October 31, 1915.

*Gauge.*—Vertical staff. Zero maintained at elevation 87.00 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—The stream flows in one channel except in very high stages; bed consists of sand, clay and gravel.

*Discharge measurements.*—At low stages made by wading, at high stages a portable cable and cable car is used.

*Diversions.*—Hooper and Huckvale's north ditch diverts water about one-half mile above this station and the south ditch about one-half mile below.

*Observer.*—Sidney Hooper.

DISCHARGE MEASUREMENTS of Manyberries Creek at Hooper and Huckvale Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 19 | W. H. Storey | 3.5 | 0.48 | 0.20 | 2.20 | 0.09 |
| May 7 | do | ..... | ..... | ..... | 2.18 | 0.57a |
| May 17 | do | ..... | ..... | ..... | 2.18 | 0.08a |
| June 4 | do | 10.0 | 2.80 | 1.33 | 2.51 | 3.73 |
| June 7 | C. S. Rickards | ..... | ..... | ..... | ..... | Nil. |
| June 10 | W. H. Storey | ..... | ..... | ..... | ..... | b |
| June 29 | do | ..... | ..... | ..... | ..... | Nil. |
| July 27 | do | ..... | ..... | ..... | ..... | b |
| Aug. 13 | do | ..... | ..... | ..... | ..... | b |
| Aug. 31 | do | ..... | ..... | ..... | ..... | b |
| Sept. 21 | do | ..... | ..... | ..... | 2.04 | 0.03a |
| Oct. 9 | do | ..... | ..... | ..... | ..... | b |
| Oct. 23 | do | ..... | ..... | ..... | ..... | b |

*a* Weir measurements.
*b* Small trickle, too small to measure.

DAILY GAUGE HEIGHT AND DISCHARGE of Manyberries Creek at Hooper and Huckvale Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 4.51 | 67.00 | Dry. | Nil. | Dry. | Nil. |
| 2 | ..... | ..... | 5.85 | 112.00 | " | " | " | " |
| 3 | ..... | ..... | 8.70 | 209.00 | " | " | 3.20 | 22.00 |
| 4 | ..... | ..... | 3.91 | 46.00 | " | " | 2.52 | 4.30 |
| 5 | ..... | ..... | 4.72 | 74.00 | " | " | 2.35 | 2.10 |
| 6 | ..... | ..... | 4.37 | 62.00 | " | " | 2.19 | 0.89 |
| 7 | ..... | ..... | 3.66 | 38.00 | " | " | Dry. | Nil. |
| 8 | ..... | ..... | 3.24 | 23.00 | " | " | " | " |
| 9 | ..... | ..... | 3.06 | 17.30 | " | " | " | " |
| 10 | ..... | ..... | 2.96 | 14.20 | " | " | " | " |
| 11 | ..... | ..... | 2.58 | 5.40 | " | " | " | " |
| 12 | ..... | ..... | 2.33 | 1.90 | " | " | " | " |
| 13 | ..... | ..... | 2.09 | 0.37 | " | " | " | " |
| 14 | ..... | ..... | 2.01 | 0.13 | " | " | " | " |
| 15 | ..... | ..... | Dry. | Nil. | " | " | " | " |
| 16 | ..... | ..... | " | " | " | " | " | " |
| 17 | ..... | ..... | " | " | " | " | " | " |
| 18 | ..... | ..... | " | " | " | " | " | " |
| 19 | ..... | ..... | " | " | " | " | " | " |
| 20 | ..... | ..... | " | " | " | " | 2.13 | 0.56 |
| 21 | ..... | ..... | " | " | " | " | 2.20 | 0.95 |
| 22 | 4.88 | 79 | " | " | " | " | 2.21 | 1.02 |
| 23 | 5.36 | 95 | " | " | " | " | Dry. | Nil. |
| 24 | 6.56 | 136 | " | " | " | " | " | " |
| 25 | 11.40 | 301 | " | " | " | " | " | " |
| 26 | 8.20 | 192 | " | " | " | " | " | " |
| 27 | 6.40 | 131 | " | " | " | " | 2.81 | 10.20 |
| 28 | 3.48 | 31 | " | " | " | " | Dry. | Nil. |
| 29 | 4.88 | 79 | " | " | " | " | " | " |
| 30 | 4.46 | 65 | " | " | " | " | " | " |
| 31 | 4.44 | 64 | ..... | ..... | " | " | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Manyberries Creek at Hooper and Huckvale Ranch, for 1915.—*Concluded.*

| DAY. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | Dry. | Nil. | Dry. | Nil. | Dry. | Nil. | Dry. | Nil. |
| 2 | " | " | " | " | " | " | " | " |
| 3 | " | " | " | " | " | " | " | " |
| 4 | " | " | " | " | " | " | " | " |
| 5 | " | " | " | " | " | " | " | " |
| 6 | " | " | " | " | " | " | " | " |
| 7 | " | " | " | " | " | " | " | " |
| 8 | " | " | " | " | " | " | " | " |
| 9 | " | " | " | " | " | " | " | " |
| 10 | " | " | " | " | " | " | " | " |
| 11 | " | " | " | " | " | " | " | " |
| 12 | " | " | " | " | " | " | " | " |
| 13 | 2.25 | 1.27 | " | " | " | " | " | " |
| 14 | 6.84 | 146.00 | " | " | " | " | " | " |
| 15 | 3.93 | 47.00 | " | " | " | " | " | " |
| 16 | 2.80 | 10.00 | " | " | " | " | " | " |
| 17 | 2.16 | 0.73 | " | " | " | " | " | " |
| 18 | 2.43 | 3.00 | 2.45 | 3.20 | " | " | " | " |
| 19 | 2.24 | 1.21 | 3.05 | 17.00 | " | " | " | " |
| 20 | 1.95 | 0.05 | 4.48 | 66.00 | " | " | " | " |
| 21 | Dry. | Nil. | 3.54 | 34.00 | " | " | " | " |
| 22 | " | " | 2.94 | 13.60 | " | " | " | " |
| 23 | " | " | 2.06 | 0.28 | " | " | " | " |
| 24 | " | " | Dry. | Nil. | " | " | " | " |
| 25 | " | " | " | " | " | " | " | " |
| 26 | " | " | " | " | " | " | " | " |
| 27 | " | " | " | " | " | " | " | " |
| 28 | " | " | " | " | " | " | " | " |
| 29 | " | " | " | " | " | " | " | " |
| 30 | 3.55 | 34.00 | " | " | " | " | " | " |
| 31 | 2.22 | 1.08 | " | " | ..... | ..... | " | " |

MONTHLY DISCHARGE of Manyberries Creek at Hooper and Huckvale Ranch, for 1915.

(Drainage area 142 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (22-31) | 301 | 31 | 117.00 | 0.824 | 0.31 | 2,321 |
| April | 209 | Nil. | 22.00 | 0.155 | 0.17 | 1,309 |
| May | ..... | ..... | ..... | ..... | ..... | Nil. |
| June | 22 | Nil. | 1.40 | 0.010 | 0.01 | 83 |
| July | 146 | " | 7.90 | 0.056 | 0.06 | 486 |
| August | 66 | " | 4.30 | 0.030 | 0.03 | 264 |
| September | ..... | ..... | ..... | ..... | ..... | Nil. |
| October | ..... | ..... | ..... | ..... | ..... | Nil. |
| The period | ..... | ..... | ..... | ..... | 0.58 | 4,463 |

HOOPER AND HUCKVALE NORTH DITCH FROM MANYBERRIES CREEK.

*Location.*—On the SW. ¼ Sec. 27, Tp. 4, Rge. 6, W. 4th Mer.
*Records available.*—From May 2, 1912, to October 31, 1915.
*Gauge.*—Vertical staff. Zero elevation maintained at 93.35 feet, since establishment.
*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.
*Discharge measurements.*—Made by wading.
*Observer.*—Sidney Hooper.

DISCHARGE MEASUREMENTS of Hooper and Huckvale North Ditch from Manyberries Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 19 | W. H. Storey | 9.7 | 3.17 | 1.21 | 2.17 | 3.82 |
| May 7 | do | ..... | ..... | ..... | 1.72 | 0.49*a* |
| May 17 | do | 8.5 | 2.82 | 0.90 | 2.02 | 2.53 |
| June 4 | do | 14.0 | 12.60 | 1.14 | 2.57 | 14.42 |
| June 7 | C. S. Rickards | 9.7 | 3.96 | 1.09 | 2.15 | 4.32 |
| June 10 | W. H. Storey | ..... | ..... | ..... | 1.78 | 0.92*a* |
| June 29 | do | 5.0 | 2.10 | 0.72 | 1.92 | 1.52 |
| July 27 | do | 3.0 | 0.73 | 0.58 | 1.67 | 0.42 |
| Aug. 13 | do | ..... | ..... | ..... | Dry. | Nil. |
| Aug. 31 | do | ..... | ..... | ..... | 1.43 | 0.06*a* |
| Sept. 21 | do | 6.0 | 0.90 | 0.37 | 1.65 | 0.33 |
| Oct. 9 | do | ..... | ..... | ..... | Dry. | Nil. |
| Oct. 23 | do | ..... | ..... | ..... | " | " |

*a* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Hooper and Huckvale North Ditch from Manyberries Creek, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.68 | 18.20 | 1.83 | 1.03 | 1.52 | 0.12 |
| 2 | ..... | ..... | 3.56 | 59.00 | 1.81 | 0.91 | 1.62 | 0.24 |
| 3 | ..... | ..... | 3.84 | 73.00 | 1.79 | 0.80 | 2.57 | 14.10 |
| 4 | ..... | ..... | 2.91 | 27.00 | 1.76 | 0.67 | 2.58 | 14.40 |
| 5 | ..... | ..... | 2.72 | 19.80 | 1.76 | 0.67 | 2.46 | 11.00 |
| 6 | ..... | ..... | 2.83 | 24.00 | 1.72 | 0.49 | 2.15 | 4.30 |
| 7 | ..... | ..... | 2.73 | 20.00 | 1.71 | 0.44 | 2.62 | 15.80 |
| 8 | ..... | ..... | 2.65 | 17.00 | 1.73 | 0.54 | 1.93 | 1.72 |
| 9 | ..... | ..... | 2.66 | 17.40 | 1.68 | 0.36 | 1.86 | 1.21 |
| 10 | ..... | ..... | 2.62 | 15.80 | 1.68 | 0.36 | 1.78 | 0.76 |
| 11 | ..... | ..... | 2.54 | 13.20 | 1.67 | 0.34 | 1.75 | 0.62 |
| 12 | ..... | ..... | 2.49 | 11.80 | 1.66 | 0.32 | 1.71 | 0.44 |
| 13 | ..... | ..... | 2.52 | 12.60 | 1.62 | 0.24 | 1.67 | 0.34 |
| 14 | ..... | ..... | 2.52 | 12.60 | 1.62 | 0.24 | 1.73 | 0.54 |
| 15 | ..... | ..... | 2.46 | 11.00 | 1.79 | 0.80 | 1.68 | 0.36 |
| 16 | ..... | ..... | 2.35 | 8.20 | 1.87 | 1.27 | 1.77 | 0.72 |
| 17 | ..... | ..... | 2.31 | 7.20 | 1.83 | 1.03 | 1.75 | 0.62 |
| 18 | ..... | ..... | 2.22 | 5.40 | 2.01 | 2.50 | 1.70 | 0.40 |
| 19 | ..... | ..... | 2.16 | 4.40 | 1.88 | 1.33 | 1.68 | 0.36 |
| 20 | ..... | ..... | 2.12 | 3.80 | 1.84 | 1.09 | 2.01 | 2.50 |
| 21 | ..... | ..... | 2.07 | 3.20 | 1.81 | 0.91 | 2.43 | 10.20 |
| 22 | 2.29 | 6.8 | 2.02 | 2.60 | 1.79 | 0.80 | 2.46 | 11.00 |
| 23 | 2.51 | 12.3 | 2.00 | 2.40 | 1.70 | 0.40 | 2.16 | 4.40 |
| 24 | 3.20 | 41.0 | 1.97 | 2.10 | 1.64 | 0.28 | 1.87 | 1.27 |
| 25 | 2.54 | 13.2 | 1.94 | 1.81 | 1.63 | 0.26 | 1.84 | 1.09 |
| 26 | 2.26 | 6.2 | 1.92 | 1.63 | 1.62 | 0.24 | 1.91 | 1.54 |
| 27 | 2.38 | 9.0 | 1.92 | 1.63 | 1.60 | 0.20 | 2.38 | 9.00 |
| 28 | 2.46 | 11.0 | 1.92 | 1.63 | 1.58 | 0.18 | 2.16 | 4.40 |
| 29 | 2.80 | 23.0 | 1.90 | 1.45 | 1.56 | 0.16 | 1.92 | 1.63 |
| 30 | 2.91 | 27.0 | 1.87 | 1.27 | 1.54 | 0.14 | 1.83 | 1.03 |
| 31 | 2.98 | 30.0 | ..... | ..... | 1.52 | 0.12 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Hooper and Huckvale North Ditch from Manyberries Creek, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.74 | 0.58 | 2.20 | 5.00 | Dry. | Nil. | Dry. | Nil. |
| 2 | 1.69 | 0.38 | 2.01 | 2 50 | " | " | " | " |
| 3 | 1.65 | 0.30 | 1.86 | 1.21 | " | " | " | " |
| 4 | 1.65 | 0.30 | 1.79 | 0.80 | " | " | " | " |
| 5 | 1.73 | 0.54 | 1.74 | 0.58 | 2.46 | 11.00 | " | " |
| 6 | 1.80 | 0.85 | 1.65 | 0.30 | 2.12 | 3.80 | " | " |
| 7 | 1.76 | 0.67 | 1.61 | 0.22 | 1.91 | 1.54 | " | " |
| 8 | 1.52 | 0.12 | 1.52 | 0.12 | 1.83 | 1.03 | " | " |
| 9 | 1.54 | 0.14 | 1.45 | 0.05 | 1.78 | 0.76 | " | " |
| 10 | 1 57 | 0.17 | Dry. | Nil. | 1.71 | 0.44 | " | " |
| 11 | 1.51 | 0.11 | " | " | 1.63 | 0.26 | " | " |
| 12 | 1.46 | 0.06 | " | " | 1.61 | 0.22 | " | " |
| 13 | 1.84 | 1.09 | " | " | 1.61 | 0.22 | " | " |
| 14 | 3.30 | 46.00 | " | " | 1.66 | 0.32 | " | " |
| 15 | 2.50 | 12.00 | " | " | 2.13 | 4.00 | " | " |
| 16 | 2.00 | 2.40 | " | " | 2.06 | 3.10 | " | " |
| 17 | 2.34 | 8.00 | 2.04 | 2.80 | 1.89 | 1.39 | " | " |
| 18 | 2.34 | 8.00 | 2.41 | 9.80 | 1 83 | 1.03 | " | " |
| 19 | 2.39 | 9.20 | 2.09 | 3.40 | 1.80 | 0.85 | " | " |
| 20 | 2.14 | 4.10 | 1.97 | 2.10 | 1.72 | 0.49 | " | " |
| 21 | 2.08 | 3.30 | 1.95 | 1.90 | 1.65 | 0.30 | " | " |
| 22 | 1.91 | 1.54 | 1.75 | 0.62 | 1.61 | 0.22 | " | " |
| 23 | 1.82 | 0.97 | 1.71 | 0.44 | 1.58 | 0.18 | " | " |
| 24 | 1.76 | 0.67 | 1.70 | 0.40 | 1.57 | 0.17 | " | " |
| 25 | 1.72 | 0.49 | 1.68 | 0.36 | 1.53 | 0.13 | " | " |
| 26 | 1.63 | 0.26 | 1.68 | 0.36 | Dry. | Nil. | " | " |
| 27 | 1.71 | 0.44 | 1.66 | 0.32 | " | " | " | " |
| 28 | 1.81 | 0.91 | 1.62 | 0.24 | " | " | " | " |
| 29 | 1.78 | 0.76 | 1.57 | 0.17 | " | " | " | " |
| 30 | 2.23 | 5.60 | 1.52 | 0 12 | " | " | " | " |
| 31 | 2.47 | 11.20 | 1.46 | 0 06 | ..... | ..... | " | " |

MONTHLY DISCHARGE of Hooper and Huckvale North Ditch from Manyberries Creek, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| March (22–31) | 41 0 | 6 20 | 18 00 | 36 |
| April | 73 0 | 1 27 | 13 40 | 797 |
| May | 2 5 | 0 12 | 0 62 | 38 |
| June | 15 8 | 0 12 | 3 90 | 232 |
| July | 46 0 | 0 06 | 3 90 | 240 |
| August | 9 8 | 0 05 | 1 10 | 68 |
| September | 11 0 | Nil. | 1 03 | 61 |
| October | | | | Nil |
| The period | | | | 1 472 |

HOOPER AND HUCKVALE SOUTH DITCH FROM MANYBERRIES CREEK.

*Location.*—On the NE. ¼ Sec. 22, Tp. 4, Rge. 6, W. 4th Mer.
*Records available.*—March 31, 1914, to October 31, 1915.
*Gauge.*—Vertical staff. Zero elevation maintained at 93 07 feet, since establishment.
*Bench-mark.*—1″ x 4″ post in headgate of ditch. Assumed elevation, 100 00 feet.
*Discharge measurements.*—Made by wading.
*Observer.*—Sidney Hooper.

DISCHARGE MEASUREMENTS of Hooper and Huckvale South Ditch from Manyberries Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 19 | W. H. Storey | | | | Dry. | Nil. |
| May 7 | do | | | | " | " |
| June 4 | do | 6.0 | 2.10 | 0.72 | 1.64 | 1.51 |
| June 7 | C. S Rickards | | | | Dry. | Nil. |
| June 10 | W. H. Storey | | | | " | " |
| June 29 | do | | | | " | " |
| July 27 | do | | | | " | " |
| Aug. 13 | do | | | | " | " |
| Aug. 31 | do | | | | " | " |
| Sept. 21 | do | | | | " | " |
| Oct. 9 | do | | | | " | " |
| Oct. 23 | do | | | | " | " |

DAILY GAUGE HEIGHT AND DISCHARGE of Hooper and Huckvale South Ditch from Manyberries Creek, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | | | Dry. | Nil. | Dry. | Nil. | Dry. | Nil. |
| 2 | | | 4.23 | 36.00 | " | " | " | " |
| 3 | | | 4.43 | 39.00 | " | " | " | " |
| 4 | | | 4.63 | 42.00 | " | " | 1.65 | 1.65 |
| 5 | | | 3.54 | 26.00 | " | " | 1.30 | 0.35 |
| 6 | | | 2.33 | 9.40 | " | " | Dry. | Nil. |
| 7 | | | 1.69 | 1.93 | " | " | " | " |
| 8 | | | 1.53 | 0.99 | " | " | " | " |
| 9 | | | 1.30 | 0.35 | " | " | " | " |
| 10 | | | Dry. | Nil. | " | " | " | " |
| 11 | | | " | " | " | " | " | " |
| 12 | | | " | " | " | " | " | " |
| 13 | | | " | " | " | " | " | " |
| 14 | | | " | " | " | " | " | " |
| 15 | | | " | " | " | " | " | " |
| 16 | | | " | " | " | " | " | " |
| 17 | | | " | " | " | " | " | " |
| 18 | | | " | " | " | " | " | " |
| 19 | | | " | " | " | " | " | " |
| 20 | | | " | " | " | " | 1.19 | 0.19 |
| 21 | Dry. | Nil. | " | " | " | " | 1.24 | 0.26 |
| 22 | " | " | " | " | " | " | 1.25 | 0.28 |
| 23 | " | " | " | " | " | " | Dry. | Nil. |
| 24 | " | " | " | " | " | " | " | " |
| 25 | " | " | " | " | " | " | " | " |
| 26 | " | " | " | " | " | " | " | " |
| 27 | " | " | " | " | " | " | 1.86 | 3.50 |
| 28 | " | " | " | " | " | " | Dry. | Nil. |
| 29 | " | " | " | " | " | " | " | " |
| 30 | " | " | " | " | " | " | " | " |
| 31 | " | " | | | " | " | | |

DAILY GAUGE HEIGHT AND DISCHARGE of Hooper and Huckvale South Ditch from Manyberries Creek, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | Dry. | Nil. | Dry. | Nil. | Dry. | Nil. | Dry. | Nil. |
| 2 | " | " | " | " | " | " | " | " |
| 3 | " | " | " | " | " | " | " | " |
| 4 | " | " | " | " | " | " | " | " |
| 5 | " | " | " | " | " | " | " | " |
| 6 | " | " | " | " | " | " | " | " |
| 7 | " | " | " | " | " | " | " | " |
| 8 | " | " | " | " | " | " | " | " |
| 9 | " | " | " | " | " | " | " | " |
| 10 | " | " | " | " | " | " | " | " |
| 11 | " | " | " | " | " | " | " | " |
| 12 | " | " | " | " | " | " | " | " |
| 13 | 1.10 | 0.10 | " | " | " | " | " | " |
| 14 | 2.99 | 18.70 | " | " | " | " | " | " |
| 15 | 2.10 | 6.30 | " | " | " | " | " | " |
| 16 | 1.76 | 2.50 | " | " | " | " | " | " |
| 17 | Dry. | Nil. | " | " | " | " | " | " |
| 18 | " | " | " | " | " | " | " | " |
| 19 | " | " | " | " | " | " | " | " |
| 20 | " | " | 3.55 | 26.0 | " | " | " | " |
| 21 | " | " | 3.04 | 19.4 | " | " | " | " |
| 22 | " | " | 2.33 | 9.4 | " | " | " | " |
| 23 | " | " | 1.74 | 2.4 | " | " | " | " |
| 24 | " | " | Dry. | Nil. | " | " | " | " |
| 25 | " | " | " | " | " | " | " | " |
| 26 | " | " | " | " | " | " | " | " |
| 27 | " | " | " | " | " | " | " | " |
| 28 | " | " | " | " | " | " | " | " |
| 29 | " | " | " | " | " | " | " | " |
| 30 | " | " | " | " | " | " | " | " |
| 31 | " | " | " | " | " | " | " | " |

MONTHLY DISCHARGE of Hooper and Huckvale South Ditch from Manyberries Creek, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | |
| March (21–30) | .. | .. | .. | Nil. |
| April | 42 0 | Nil. | 5 20 | 309 |
| May | .. | .. | .. | Nil. |
| June | 3 5 | Nil. | 0 21 | 12 |
| July | 18 7 | Nil. | 0 90 | 55 |
| August | 26 0 | Nil. | 1 84 | 113 |
| September | .. | .. | .. | Nil. |
| October | .. | .. | .. | " |
| The period | | | | 489 |

KETCHUM CREEK AT PICKETT'S RANCH.

*Location.*—On the NE. ¼ Sec. 25, Tp. 4, Rge. 7, W. 4th Mer.
*Records available.*—May 17, 1915, to October 31, 1915.
*Gauge.*—Vertical staff. Zero elevation, maintained at 93.985 feet since establishment.
*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.
*Discharge measurements.*—Made by wading; none were obtained during 1915.
*Observer.*—C. J. Pickett.
*Remarks.*—Station established May 17, 1915, by W. H. Storey.

DISCHARGE MEASUREMENTS of Ketchum Creek at Pickett's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| June 10 | W. H. Storey | | | | Dry. | Nil. |
| June 30 | do | | | | " | " |
| July 7 | do | | | | " | " |
| July 28 | do | | | | 1.40 | a |
| Aug. 16 | do | | | | Dry. | Nil. |
| Sept. 1 | do | | | | " | " |
| Sept. 22 | do | | | | " | " |
| Oct. 11 | do | | | | " | " |
| Oct. 23 | do | | | | " | " |

*a* Small trickle, too small to measure.

DAILY GAUGE HEIGHT of Ketchum Creek at Pickett's Ranch, for 1915.

| Day. | May. | | June. | | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | | | Dry. | | Dry. | | Dry. | | Dry. | | Dry. | |
| 2 | | | " | | " | | " | | " | | " | |
| 3 | | | " | | " | | " | | " | | " | |
| 4 | | | " | | " | | " | | " | | " | |
| 5 | | | " | | " | | " | | " | | " | |
| 6 | | | " | | " | | " | | " | | " | |
| 7 | | | " | | " | | " | | " | | " | |
| 8 | | | " | | " | | " | | " | | " | |
| 9 | | | " | | " | | " | | " | | " | |
| 10 | | | " | | " | | " | | " | | " | |
| 11 | | | " | | " | | " | | " | | " | |
| 12 | | | " | | " | | " | | " | | " | |
| 13 | | | " | | " | | " | | " | | " | |
| 14 | | | " | | 2.25 | | " | | " | | " | |
| 15 | | | " | | 5.05 | | " | | " | | " | |
| 16 | | | " | | 4.62 | | " | | " | | " | |
| 17 | Dry. | | " | | 3.90 | | " | | " | | " | |
| 18 | 1.44 | | " | | 3.28 | | " | | " | | " | |
| 19 | 1.35 | | " | | 3.55 | | 2.55 | | " | | " | |
| 20 | 1.35 | | " | | 2.44 | | 4.32 | | " | | " | |
| 21 | Dry. | | " | | 2.15 | | 2.82 | | " | | " | |
| 22 | " | | " | | 1.90 | | 3.50 | | " | | " | |
| 23 | " | | " | | 1.80 | | 2.90 | | " | | " | |
| 24 | " | | " | | 1.60 | | 2.40 | | " | | " | |
| 25 | " | | " | | 1.58 | | 1.90 | | " | | " | |
| 26 | " | | " | | 1.50 | | 1.72 | | " | | " | |
| 27 | " | | " | | 1.43 | | 1.65 | | " | | " | |
| 28 | " | | " | | 1.40 | | 1.62 | | " | | " | |
| 29 | " | | " | | Dry. | | 1.51 | | " | | " | |
| 30 | " | | " | | " | | 1.45 | | " | | " | |
| 31 | " | | " | | " | | 1.40 | | " | | " | |

NOTE.—No discharge measurements were obtained on this stream, and an estimate of the discharge was not attempted.

MISCELLANEOUS DISCHARGE MEASUREMENTS in Pakowki Lake drainage basin, in 1915.

| Date. | Engineer. | Stream. | Location. | Width. | Area of Section. | Mean Velocity. | Discharge. |
|---|---|---|---|---|---|---|---|
| | | | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Sec.-ft.* |
| April 19 | W. H. Storey | Canal Creek | Sec. 6-4-6-4 | | | | Nil. |
| May 7 | do | do | Sec. 27-3-6-4 | | | | " |
| May 18 | do | do | Sec. 6-4-6-4 | 6.0 | 5.00 | 0.76 | 3.780 |
| June 10 | do | do | do | 5.0 | 4.80 | 0.65 | 3.100 |
| June 11 | do | do | Sec. 27-3-6-4 | 4.5 | 1.62 | 0.50 | 0.810 |
| June 29 | do | do | do | | | | 0.195*a* |
| July 2 | do | do | Sec. 6-4-6-4 | 6.0 | 2.50 | 0.74 | 1.840 |
| July 7 | do | do | do | 6.0 | 2.30 | 0.54 | 1.250 |
| July 10 | do | do | do | 7.0 | 4.50 | 0.87 | 3.910 |
| July 27 | do | do | Sec. 27-3-6-4 | | | | Nil. |
| July 28 | do | do | Sec. 6-4-6-4 | | | | " |
| Aug. 13 | do | do | Sec. 27-3-6-4 | | | | " |
| Aug. 16 | do | do | Sec. 6-4-6-4 | | | | " |
| Aug. 31 | do | do | Sec. 27-3-6-4 | | | | " |
| Sept. 1 | do | do | Sec. 6-4-6-4 | | | | " |
| Sept. 21 | do | do | Sec. 27-3-6-4 | | | | 0.148*a* |
| Sept. 22 | do | do | Sec. 6-4-6-4 | | | | Nil. |
| Oct. 9 | do | do | Sec. 27-3-6-4 | | | | 0.148*a* |
| Oct. 11 | do | do | Sec. 6-4-6-4 | | | | 0.171*a* |
| Oct. 23 | do | do | do | | | | Nil. |
| Oct. 26 | do | do | Sec. 27-3-6-4 | | | | " |
| June 29 | do | Dead Creek | SW. 22-4-6-4 | | | | " |
| July 27 | do | do | do | | | | " |
| Aug. 13 | do | do | do | | | | " |
| Aug. 31 | do | do | do | | | | " |
| Sept. 21 | do | do | do | | | | 0.036*a* |
| Oct. 9 | do | do | do | | | | Nil. |
| Oct. 26 | do | do | do | | | | " |
| June 9 | do | Irrigation Creek | Sec 7-6-5-4 | | | | " |
| April 19 | do | Ketchum Creek (North Br) | Sec. 16-4-6-4 | | | | " |
| May 7 | do | do | do | | | | " |
| May 18 | do | do | do | | | | " |
| June 11 | do | do | do | | | | " |
| June 29 | do | do | do | | | | 0.266*a* |
| July 27 | do | do | do | | | | Nil. |
| Aug. 13 | do | do | do | | | | " |
| Aug. 31 | do | do | do | | | | " |
| Sept. 21 | do | do | do | | | | 0.093*a* |
| Oct. 9 | do | do | do | | | | Nil. |
| Oct. 26 | do | do | do | | | | " |
| July 27 | do | do (South Br.) | Sec. 10-4-6-4 | | | | " |
| Aug. 13 | do | do | do | | | | " |
| Aug. 31 | do | do | do | | | | " |
| Sept. 21 | do | do | do | | | | " |
| Oct. 9 | do | do | do | | | | " |
| Oct. 26 | do | do | do | | | | " |
| July 3 | do | Ketchum Creek | Sec. 35-4-7-4 | | | | " |
| July 28 | do | do | do | | | | " |
| Aug. 14 | do | do | do | | | | " |
| May 17 | do | Manyberries Creek | Sec. 3-5-7-4 | | | | " |
| June 10 | do | do | do | | | | " |
| July 3 | do | do | do | | | | " |
| July 28 | do | do | do | | | | " |
| Aug. 14 | do | do | do | | | | " |
| Oct. 11 | do | do | Sec. 31-4-6-4 | 5.0 | 1.00 | 0.30 | 0.300 |
| June 9 | do | do (North Br.) | SE. 21-5-6-4 | | | | 5 |

*a* Weir measurement.
*b* Small trickle, too small to measure.

## SAGE CREEK DRAINAGE BASIN.

*General Description.*

Sage Creek is a small and unimportant stream which rises in Township 5, Range 4, West of the 4th Meridian, and flows southerly, crossing the international boundary in Range 2.

The stream has no definite or permanent source of supply, and derives its discharge principally from the melting snow, which accumulates in numerous coulees during the winter months. The period of flow, therefore, is in general confined to the spring months, while the melting snow is passing off. Very heavy rains sometimes cause a flow, but the drainage area being absolutely devoid of tree growth the run-off is very rapid.

After entering the United States, Sage Creek spreads out over a large dry lake, which has no outlet. This lake is about ten miles long and averages one and one-half miles in width, and lies close to the boundary. The lake is bounded on the south by a low range of hills, and at some time has held two or three feet of water at its deepest parts. Since 1908 there has been no water in the lake.

### SAGE CREEK AT WILD HORSE POLICE DETACHMENT.

*Location.*—On the NE. ¼ Sec. 9, Tp. 1, Rge. 2, W. 4th Mer., near Wild Horse Police Detachment.

*Records available.*—Estimated discharge records for 1910–13, based on discharge measurements made in 1915, are given herewith and supersede those published in the 1914 report.

*Gauge.*—Vertical staff. Zero of gauge maintained at 93.36 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Discharge measurements.*—Made by wading or with a weir.

*Channel.*—Composed of hard clay and well grassed over. Practically permanent.

*Observer.*—No records of gauge heights were obtained in 1915 although there was flow for about two weeks in the fall.

*Accuracy.*—The estimates given herewith are not considered absolutely correct but are compiled from the best available data.

DISCHARGE MEASUREMENTS of Sage Creek at Wild Horse Police Detachment, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Aug. 12 | H. W. Rowley | ..... | ..... | ..... | 1.62 | Nil. |
| Aug. 17 | H. R. Carscallen | 13.0 | 50 | 0.99 | 4.78 | 50.00 |
| Aug. 18 | do | 14.8 | 55 | 0.96 | 5.50 | 53.00 |
| Sept. 1 | H. W. Rowley | ..... | ..... | ..... | 2.21 | 0.91*a* |

*a* Weir measurement.

ANNUAL DISCHARGE of Sage Creek at Wild Horse Police Detachment, for 1910–13.

| Year. | Discharge in Second-Feet. | | | Run-Off. | |
|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Total in Acre-feet. | Corrected total in Acre-feet.*a* |
| 1910 | 31.5 | 0.05 | 12.97 | 360 | ..... |
| 1911 | 77.9 | 0.00 | 7.31 | 914 | 1,074 |
| 1912 | 84.8 | 0.00 | 17.24 | 2,086 | 2,926 |
| 1913 | 60.2 | 0.00 | 13.51 | 1,501 | 1,951 |

*a* The creek above the station has built up a channel above the flats on each side, and some of the flood flow finds its way onto these flats. The corrected total run-off provides for this loss which has been estimated by H. R. Carscallen, Irrigation Inspector, as 160 acre-feet, in 1911, 840 acre-feet, in 1912 and 450 acre-feet in 1913.

PLATE 24

Sage Creek in flood at "Q" Ranch, on August 17, 1915. Note the natural irrigation of the hay meadows. Taken by H. R. Carscallen.

PLATE 25

Sage Creek in flood at Wild Horse Police Detachment, on August 18, 1915. Taken by H. R. Carscallen.

## LODGE CREEK DRAINAGE BASIN.

### *General Description.*

Lodge Creek, which rises in Township 7, Range 3, West of the 4th Meridian, flows in a southerly direction for about twelve miles, then turns southeastward, crosses the international boundary at Section 4, Township 1, Range 28, West of the 3rd Meridian, and eventually empties into Milk River at Chinook, Montana. Its principal tributary is Middle Creek, which joins it in Section 4, Township 2, Range 29, West of the 3rd Meridian.

Near its head the valley is very deep and narrow but it broadens out considerably lower down, giving rise to large flats and meadows. The upper part of the drainage basin is cut up to a great extent by deep coulees which drain into the creek. This part of the creek is thickly covered with brush along the banks, but lower down it is totally devoid of tree growth. The valley is rather unproductive owing to the absence of moisture but a few good hay meadows have been developed along its course through the storage of the flood waters and their application to the soil by irrigation. As is the case with many of the streams in this locality the flow in Lodge Creek is not continuous throughout the year, the creek being dry, with the exception of pools of standing water, during the greater part of the summer months. At flood stages the creek carries a considerable amount of water and as a result its channel is wide and well defined throughout the whole length of its course.

The station at Willow Creek Police Detachment was the only station on the main stream maintained for the full season of 1915.

The station at Hester's ranch was discontinued at the beginning of the season, and the station at Hartt's ranch was discontinued on June 8, 1915. Descriptions of these stations and others maintained in the Lodge Creek drainage area are given below.

#### HANCKEL DITCH NEAR EAGLE BUTTE.

*Location.*—About three-quarters of a mile downstream from intake of ditch. On NE. ¼ Sec. 30, Tp. 7, Rge. 3, W. 4th Mer.

*Gauge.*—Vertical staff driven into the bed of the stream near the right bank. The zero of the gauge was established and maintained at 98.38 feet.

*Bench-mark.*—Permanent iron bench-mark near the gauge on the right bank. Assumed elevation, 100.00 feet.

*Channel.*—Composed of gumbo.

*Discharge measurements.*—Made with meter or weir.

*Observer.*—Miss Hanckel.

*Remarks.*—This station was established by H. R. Carscallen, October 4, 1915. No records available for 1915.

#### H. A. MUDIE DITCH FROM SEXTON CREEK.

*Location.*—On the NW ¼ Sec. 21, Tp. 7, Rge. 3, W. 4th Mer., about one-quarter of a mile downstream from intake of ditch.

*Gauge.*—Vertical staff driven into the bed of the ditch near the right bank. The elevation of zero of gauge maintained at 97.16 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark located near the gauge on the right bank. Assumed elevation, 100.00 feet.

*Channel.*—Composed of gumbo.

*Discharge measurements.*—Made with current meter or with weir.

*Observer.*—H. A. Mudie.

*Remarks.*—This station was established September 28, 1915, by H. R. Carscallen. No records available for 1915.

#### M. T. CLARK NORTH DITCH FROM SEXTON CREEK.

*Location.*—On the SW. ¼ Sec. 21, Tp. 7, Rge. 3, W. 4th Mer., 430 feet below headgate of irrigation ditch.

*Gauge.*—Vertical staff driven into the bed of the ditch. Elevation of zero maintained at 97.61 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark located on the right bank near the gauge. Assumed elevation, 100.00 feet.

*Channel.*—Composed of sand loam.

*Discharge measurements.*—Made with weir or meter.

*Observer.*—M. T. Clark.

*Remarks.*—Station established September 28, 1915, by H. R. Carscallen. No records available for 1915.

M. T. CLARK SOUTH DITCH FROM SEXTON CREEK.

*Location.*—On the SW. ¼ Sec. 21, Tp. 7, Rge. 3, W. 4th Mer., 140 feet below intake of ditch.

*Gauge.*—Vertical staff driven into the bed of the ditch near the left bank. Elevation of zero of gauge maintained at 95.32 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark, located at the north ditch station. Assumed elevation, 100.00 feet.

*Channel.*—Composed of sand loam.

*Discharge measurements.*—Made with a weir or meter.

*Observer.*—M. T. Clark.

*Remarks.*—This station was established by H. R. Carscallen, September 28, 1915. No records available for 1915.

JOHN READ DITCH FROM MICHEL COULEE.

*Location.*—On the NE ¼ Sec. 33, Tp. 6, Rge. 3, W. 4th Mer., 90 feet below point of ditch from Michel Coulee.

*Gauge.*—Vertical staff gauge driven in the bed of the ditch near the left bank. Elevation of zero maintained at 95.45 feet since establishment.

*Bench-mark.*—Top of iron post located near the gauge on the left bank of ditch. Assumed elevation, 100.00 feet.

*Channel.*—Composed of gumbo.

*Discharge measurements.*—Made with a current meter or with a weir.

*Observer.*—John Read.

*Remarks.*—This station was established by H. R. Carscallen September 28, 1915. No records available for 1915.

JOHN READ DITCH FROM READ CREEK.

*Location.*—On the NE. ¼ Sec. 34, Tp. 6, Rge. 3, W. 4th Mer., 300 feet downstream from intake of ditch.

*Gauge.*—Vertical staff, driven into bed of stream near right bank. Zero of gauge maintained at 97.30 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark near the gauge on the left bank of ditch. Assumed elevation, 100.00 feet.

*Channel.*—Composed of sand loam.

*Discharge measurements.*—Made with current meter or with a weir.

*Observer.*—John Reid.

*Remarks.*—Station established September 27, 1915, by H. R. Carscallen. No records available for 1915.

ENGLISH DITCH FROM EAST BRANCH OF LODGE CREEK.

*Location.*—On the SW. ¼ Sec. 12, Tp. 7, Rge. 3, W. 4th Mer., 360 feet above two-way gate where first lateral is taken out of main ditch.

*Gauge.*—Vertical staff driven into bed of the stream near the left bank. Elevation of zero of gauge maintained at 97.69 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark, located in the left bank near the gauge. Assumed elevation, 100.00 feet.

*Channel.*—Composed of gravel and loam.

*Discharge measurements.*—Made with meter or weir.

*Observer.*—James English.

*Remarks.*—This station was established September 29, 1915, by H. R. Carscallen too late to obtain any records for the irrigation season of 1915.

EAST BRANCH OF LODGE CREEK AT ENGLISH'S RANCH.

*Location.*—On the SE. ¼ Sec. 1, Tp. 7, Rge. 3, W. 4th Mer., at James English's ranch.

*Records available.*—October 7, 1911, to October 31, 1915.

*Gauge.*—Vertical staff. Zero elevation of gauge maintained at 95.38 feet during 1911. Zero elevation of gauge maintained at 95.43 feet during 1912. Zero elevation of gauge maintained at 95.35 feet during 1913–15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Not likely to shift except during floods.

*Discharge measurements.*—Made by wading or with weir.

*Winter flow.*—Station discontinued during winter season.

*Control.*—On August 19 an artificial log control was installed at this station.

*Diversions.*—Water is diverted for irrigation, about three miles above this station, by James English.

DISCHARGE MEASUREMENTS of East Branch of Lodge Creek at English's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 11 | H. W. Rowley | ...a | ... | ... | 0.98 | 0.17 |
| June 8 | do | ...a | ... | ... | 1.20 | 2.30 |
| June 9 | do | ...a | ... | ... | 1.14 | 1.59 |
| Aug. 19 | do | ... | ... | ... | 0.89 | Nil. |
| Sept. 13 | do | ... | ... | ... | Dry. | " |
| Oct. 7 | do | ... | ... | ... | " | " |
| Oct. 30 | do | ...a | ... | ... | 0.93 | 0.17 |

*a* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of East Branch of Lodge Creek at English's Ranch, for 1915.

| DAY. | April. | | May. | | June. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.35 | 4.50 | 0.95 | 0.08 | 1.00 | 0.28 |
| 2 | 1.65 | 9.00 | 0.95 | 0.08 | 1.17 | 1.94 |
| 3 | 3.32 | 34.00 | 0.95 | 0.08 | 1.38 | 4.90 |
| 4 | 2.98 | 29.00 | 0.95 | 0.08 | 2.78 | 26.00 |
| 5 | 2.12 | 16.00 | 0.95 | 0.08 | 2.67 | 24.00 |
| 6 | 1.75 | 10.50 | 0.90 | 0.00 | 2.65 | 24.00 |
| 7 | 1.55 | 7.50 | 0.90 | 0.00 | 2.12 | 16.00 |
| 8 | 1.40 | 5.20 | 0.90 | 0.00 | 1.35 | 4.50 |
| 9 | 1.35 | 4.50 | 0.90 | 0.00 | 1.14 | 1.58 |
| 10 | 1.35 | 4.50 | 0.90 | 0.00 | 1.20 | 2.30 |
| 11 | 1.25 | 3.00 | 0.90 | 0.00 | 1.20 | 2.30 |
| 12 | 1.30 | 3.70 | 0.90 | 0.00 | 1.20 | 2.30 |
| 13 | 1.25 | 3.00 | 1.12 | 1.35 | 1.15 | 1.70 |
| 14 | 1.25 | 3.00 | 1.16 | 1.82 | 1.10 | 1.13 |
| 15 | 1.25 | 3.00 | 1.42 | 5.50 | 1.05 | 0.65 |
| 16 | 1.30 | 3.70 | 1.42 | 5.50 | 1.05 | 0.65 |
| 17 | 1.32 | 4.00 | 1.48 | 6.40 | 1.00 | 0.28 |
| 18 | 1.25 | 3.00 | 1.40 | 5.20 | 1.00 | 0.28 |
| 19 | 1.22 | 2.60 | 1.35 | 4.50 | 1.00 | 0.28 |
| 20 | 1.20 | 2.30 | 1.30 | 3.70 | 0.95 | 0.08 |
| 21 | 1.25 | 3.00 | 1.19 | 2.20 | 0.95 | 0.08 |
| 22 | 1.25 | 3.00 | 1.15*a* | 1.70 | 0.95 | 0.08 |
| 23 | 1.25 | 3.00 | 1.10 | 1.13 | 0.95 | 0.08 |
| 24 | 1.20 | 2.30 | 1.20 | 2.30 | 1.00 | 0.28 |
| 25 | 1.20 | 2.30 | 1.18 | 2.10 | 1.05 | 0.65 |
| 26 | 1.15 | 1.70 | 1.05 | 0.65 | 1.05 | 0.65 |
| 27 | 1.15 | 1.70 | 1.00 | 0.28 | 1.15 | 1.70 |
| 28 | 1.10 | 1.13 | 0.95 | 0.08 | 1.10 | 1.13 |
| 29 | 1.05 | 0.65 | 0.95 | 0.08 | 1.00 | 0.28 |
| 30 | 1.00 | 0.28 | 0.95 | 0.08 | 1.00 | 0.28 |
| 31 | ... | ... | 0.98 | 0.18 | ... | ... |

*a* Gauge height interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of East Branch of Lodge Creek at English's Ranch, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.00*a* | 0.28 | 0.99 | 0.23 | Dry. | Nil. | Dry. | Nil. |
| 2 | 0.95*a* | 0.08 | 1.00 | 0.28 | " | " | " | " |
| 3 | 0.90*a* | 0.00 | 0.90 | Nil. | " | " | " | " |
| 4 | 0.90 | 0.06 | 0.90 | " | " | " | " | " |
| 5 | 0.90 | 0.00 | 0.90 | " | " | " | " | " |
| 6 | 0.90 | 0.00 | 0.90 | " | " | " | " | " |
| 7 | 0.90 | 0.00 | Dry. | " | " | " | " | " |
| 8 | 0.90 | 0.00 | " | " | " | " | 0.96 | 0.32 |
| 9 | 0.90 | 0.00 | " | " | " | " | 0.98 | 0.44 |
| 10 | 0.90 | 0.00 | " | " | " | " | 0.98 | 0.44 |
| 11 | 0.90 | 0.00 | " | " | " | " | 0.98 | 0.44 |
| 12 | 0.90 | 0.00 | " | " | " | " | 0.98 | 0.44 |
| 13 | 1.04 | 0.57 | " | " | " | " | 0.98 | 0.44 |
| 14 | 1.87 | 12.30 | " | " | " | " | 0.98 | 0.44 |
| 15 | 1.70 | 9.70 | " | " | " | " | 0.98 | 0.44 |
| 16 | 1.30 | 3.70 | " | " | " | " | 0.98 | 0.44 |
| 17 | 1.25 | 3.00 | " | " | " | " | 1.00 | 0.58 |
| 18 | 1.20 | 2.30 | " | " | " | " | 1.00 | 0.58 |
| 19 | 1.05 | 0.65 | 0.88*b* | 0.02 | " | " | 1.00 | 0.58 |
| 20 | 1.00 | 0.28 | 0.84 | Nil. | " | " | 1.00 | 0.58 |
| 21 | 1.04*a* | 0.57 | 0.80 | " | " | " | 1.00 | 0.58 |
| 22 | 1.08 | 0.93 | 0.80 | " | " | " | 1.00 | 0.58 |
| 23 | 1.08 | 0.93 | 0.65 | " | " | " | 1.00 | 0.58 |
| 24 | 1.10 | 1.13 | Dry. | " | " | " | 1.00 | 0.58 |
| 25 | 1.12 | 1.35 | " | " | " | " | 0.95 | 0.26 |
| 26 | 1.12 | 1.35 | " | " | " | " | 0.95 | 0.26 |
| 27 | 1.15 | 1.70 | " | " | " | " | 0.95 | 0.26 |
| 28 | 1.15 | 1.70 | " | " | " | " | 0.95 | 0.26 |
| 29 | 1.20 | 2.30 | " | " | " | " | 0.95 | 0.26 |
| 30 | 1.20 | 2.30 | " | " | " | " | 0.95 | 0.26 |
| 31 | 1.20 | 2.30 | " | " | " | " | 0.95*a* | 0.26 |

*a* Gauge height interpolated.
*b* Artificial control installed.

MONTHLY DISCHARGE of East Branch of Lodge Creek at English's Ranch, for 1915.

(Drainage area 15.6 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| April | 34.00 | 0.28 | 5.80 | 0.3740 | 0.420 | 348 |
| May | 6.40 | 0.00 | 1.46 | 0.0936 | 0.110 | 90 |
| June | 26.00 | 0.08 | 4.00 | 0.2570 | 0.290 | 238 |
| July | 12.30 | 0.00 | 1.59 | 0.1020 | 0.120 | 98 |
| August | 0.28 | 0.00 | 0.02 | 0.00109 | 0.001 | 1 |
| September | 0.00 | 0.00 | 0.00 | 0.0000 | 0.000 | 0 |
| October | 0.58 | 0.00 | 0.33 | 0.0212 | 0.020 | 20 |
| The period | ..... | ..... | ..... | ..... | 0.961 | 795 |

### ANDERSON DITCH FROM EAST BRANCH OF LODGE CREEK.

*Location.*—On the SW. ¼ Sec. 23, Tp. 6, Rge. 3, W. 4th Mer., at intake of Robert Anderson's ditch.

*Records available.*—For the irrigation season of 1912–15.

*Gauge.*—Vertical staff. The elevation, of the zero of the gauge was maintained at 97.63 feet during 1912; at 97.64 feet during 1913–14; and at 96.76 feet during 1915.

*Bench-mark.*—A permanent iron bench-mark was installed on the left bank, 10 feet from the gauge and permanent weir. Assumed elevation, 100.00 feet. Elevation of old wooden bench-mark, 99.00 feet; elevation of floor of headgate, 97.73 feet.

*Discharge measurements.*—Made by measured head over permanent 18-inch sharp crested weir, ten feet below rod.

*Artificial control.*—A permanent sharp crested rectangular weir 10 feet below gauge rod. Elevation of crest maintained at 97.76 feet.

*Observer.*—Robert Anderson.

*Remarks.*—This ditch was used for four days during season of 1915 (May 10–13) with total estimated flow of one acre-foot.

### J. E. HARTT DITCH.

*Location.*—On NE. ¼ Sec. 15, Tp. 6, Rge. 3, W. 4th Mer., about one-half mile downstream from intake of irrigation ditch.

*Gauge.*—Vertical staff fastened to post driven into bed of ditch near right bank. Elevation of zero maintained at 97.48 feet.

*Bench-mark.*—Permanent iron bench-mark, located on the right bank, near the gauge. Assumed elevation. 100.00 feet.

*Channel.*—Composed of gravel and gumbo.

*Observer.*—J. E. Hartt.

*Remarks.*—Station established September 27, 1915, by H.R. Carscallen. No records obtained during 1915.

### LODGE CREEK AT HARTT'S RANCH.

*Location.*—On the NW. ¼ Sec. 10, Tp. 6, Rge. 3, W. 4th Mer., at Ed. Hartt's ranch.

*Records available.*—July 22, 1909, to June 8, 1915.

*Gauge.*—Vertical staff. Zero elevation of gauge maintained at 86.36 feet during 1911–12. Zero elevation of gauge maintained at 83.33 feet during 1913–15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Covered with a heavy growth of willow brush.

*Discharge measurements.*—Made by wading or with weir.

*Winter flow.*—Station discontinued during winter season.

*Artificial control.*—There are several small beaver dams near this station.

*Diversions.*—Water is diverted for irrigation above this station by Ed. Hartt and Anderson Brothers.

*Observer.*—Mrs. Clara B. Hartt.

*Remarks.*—This station was discontinued June 8, 1915.

DISCHARGE MEASUREMENTS of Lodge Creek at Hartt's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec. ft.* |
| June 8 | H. W. Rowley | 10 | 12.3 | 0.67 | 2.96 | 8.2 |
| Oct. 6 | do | ..... | ..... | ..... | 0.65 | Nil. |
| Oct. 29 | do | ..... | ..... | ..... | 0.67 | " |

DAILY GAUGE HEIGHT AND DISCHARGE of Lodge Creek at Hartt's Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 4.95 | 40.00 | 1.90 | 1.78 | 1.90 | 1.78 |
| 2 | ..... | ..... | 11.60 | 304.00 | 1.90 | 1.78 | 2.15 | 2.84 |
| 3 | ..... | ..... | 9.80 | 232.00 | 1.90 | 1.78 | 2.45 | 4.60 |
| 4 | ..... | ..... | 9.00 | 200.00 | 1.90 | 1.78 | 7.45 | 138.00 |
| 5 | ..... | ..... | 7.00 | 120.00 | 1.90 | 1.78 | 6.50 | 100.00 |
| 6 | ..... | ..... | 5.60 | 64.00 | 1.90 | 1.78 | 5.70 | 68.00 |
| 7 | ..... | ..... | 4.35 | 28.00 | 1.90 | 1.78 | 3.30 | 12.60 |
| 8 | ..... | ..... | 4.20 | 26.00 | 1.90 | 1.78 | 2.96 | 9.00 |
| 9 | ..... | ..... | 3.92 | 21.00 | 1.90 | 1.78 | ..... | ..... |
| 10 | ..... | ..... | 3.85 | 19.80 | 1.90 | 1.78 | ..... | ..... |
| 11 | ..... | ..... | 3.70 | 17.60 | 1.90 | 1.78 | ..... | ..... |
| 12 | ..... | ..... | 3.55 | 15.60 | 1.90 | 1.78 | ..... | ..... |
| 13 | ..... | ..... | 3.55 | 15.60 | 1.85 | 1.59 | ..... | ..... |
| 14 | ..... | ..... | 3.55 | 15.60 | 1.90 | 1.78 | ..... | ..... |
| 15 | ..... | ..... | 3.40 | 13.80 | 2.16 | 2.90 | ..... | ..... |
| 16 | ..... | ..... | 3.20 | 11.50 | 3.10 | 10.40 | ..... | ..... |
| 17 | ..... | ..... | 3.05 | 9.90 | 2.85 | 7.90 | ..... | ..... |
| 18 | ..... | ..... | 2.95 | 8.90 | 2.70 | 6.50 | ..... | ..... |
| 19 | ..... | ..... | 2.95 | 8.90 | 2.65 | 6.10 | ..... | ..... |
| 20 | ..... | ..... | 2.80 | 7.40 | 2.40 | 4.30 | ..... | ..... |
| 21 | 2.45 | 4.60 | 2.48 | 4.90 | 2.10 | 2.60 | ..... | ..... |
| 22 | 3.60 | 16.30 | 2.45 | 4.60 | 2.05 | 2.40 | ..... | ..... |
| 23 | 6.05 | 82.00 | 2.41 | 4.40 | 2.02 | 2.30 | ..... | ..... |
| 24 | 7.92 | 156.00 | 2.40 | 4.30 | 2.00 | 2.20 | ..... | ..... |
| 25 | 5.55 | 62.00 | 2.30 | 3.70 | 1.95 | 1.98 | ..... | ..... |
| 26 | 4.20 | 26.00 | 2.28 | 3.60 | 1.93 | 1.90 | ..... | ..... |
| 27 | 4.70 | 35.00 | 2.21 | 3.20 | 1.90 | 1.78 | ..... | ..... |
| 28 | 4.65 | 34.00 | 2.10 | 2.60 | 1.87 | 1.67 | ..... | ..... |
| 29 | 4.10 | 24.00 | 2.00 | 2.20 | 1.87 | 1.67 | ..... | ..... |
| 30 | 3.80 | 19.00 | 1.95 | 1.98 | 1.85 | 1.59 | ..... | ..... |
| 31 | 3.70 | 17.60 | ..... | ..... | 1.85 | 1.59 | ..... | ..... |

NOTE.—1914 discharge curve used to obtain discharge for 1915.

MONTHLY DISCHARGE of Lodge Creek at Hartt's Ranch, for 1915.

(Drainage area 80 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (21-31) | 156.00 | 4.60 | 43.00 | 0.5380 | 0.22 | 944 |
| April | 304.00 | 1.98 | 40.00 | 0.5000 | 0.56 | 2,380 |
| May | 10.40 | 1.59 | 2.70 | 0.0338 | 0.04 | 166 |
| June (1-8) | 138.00 | 1.78 | 42.00 | 0.5250 | 0.16 | 668 |
| The period | ..... | ..... | ..... | ..... | 0.98 | 4,158 |

This station was discontinued June 8th, 1915.

A. J. SUISTE NORTH DITCH NEAR EAGLE BUTTE.

*Location.*—On the NE. ¼ Sec. 9, Tp. 6, Rge. 3, W. 4th Mer., one-quarter of a mile below intake of ditch.

*Gauge.*—Vertical staff driven into the bed of the stream near the left bank. Zero of gauge maintained at 99.88 feet since establishment.

*Bench-mark.*—Top of three-quarters of an inch iron post located on the right bank near the gauge. Assumed elevation, 100.00 feet.

*Channel.*—Composed of gumbo.

*Discharge measurements.*—Made with meter or weir.

*Observer.*—J. E. Hartt.

*Remarks.*—This station was established September 27, 1915, by H. R. Carscallen, too late in the season to obtain records for the irrigation season of 1915.

### A. J. SUISTE SOUTH DITCH NEAR EAGLE BUTTE.

*Location.*—On the NE. ¼ Sec. 4, Tp. 6, Rge. 3, W. 4th Mer., fifty feet below dam and intake of ditch.

*Gauge.*—Vertical staff driven into bed of stream near the right bank. Elevation of zero of gauge maintained at 96.47 feet since establishment.

*Bench-mark.*—Top of a three-quarters of an inch iron post located on the right bank near the gauge rod. Assumed elevation, 100.00 feet.

*Channel.*—Composed of gumbo.

*Discharge measurements.*—Made with meter or weir.

*Observer.*—J. E. Hartt.

*Remarks.*—This station was established September 27, 1915, by H. R. Carscallen, too late to obtain records for the irrigation season of 1915.

### WM. MITCHELL UPPER DITCH FROM LODGE CREEK.

*Location.*—On the NE. ¼ Sec. 29, Tp. 5, Rge. 2, W. 4th Mer., about one mile downstream from dam and intake.

*Gauge.*—Vertical staff driven in the bed of the ditch near the left bank. The zero of the gauge was established and maintained at 97.05 feet.

*Bench-mark.*—Permanent iron bench-mark 320 feet downstream from the gauge on the left bank. Assumed elevation, 100.00 feet.

*Channel.*—Composed of gravel gumbo.

*Discharge measurements.*—Made with meter or weir.

*Artificial control.*—A log control was placed in the bed of the ditch about 30 feet below the gauge.

*Observer.*—James Mitchell.

*Remarks.*—This station was established by H. R. Carscallen July 6, 1915, too late to obtain records for the irrigation season of 1915. The ditch was used for a few days during the spring floods of 1915.

### WM. MITCHELL'S LOWER DITCH NEAR THELMA.

*Location.*—On the SE. ¼ Sec. 15, Tp. 5, Rge. 2, W. 4th Mer., about 70 feet downstream from dam and intake on Spring Creek.

*Gauge.*—Vertical staff driven into the bed of the ditch near the left bank. The zero of the gauge was established and maintained at 95.55 feet.

*Bench-mark.*—Top of iron pin set on the right bank 10 feet from gauge. Assumed elevation, 100.00 feet.

*Channel.*—Composed of gumbo.

*Discharge measurements.*—Made from measured head over a permanent sharp crested rectangular weir, located 30 feet below the gauge. The elevation of the crest of the weir is maintained at 96.66 feet.

*Observer.*—James Mitchell.

*Remarks.*—This station was established July 7, 1915, by H. R. Carscallen. No records were obtained during 1915.

### LODGE CREEK AT HESTER'S RANCH.

*Location.*—On the NE. ¼ Sec. 25, Tp. 3, Rge. 1, W. 4th Mer., at Hester Brothers' ranch. This station was moved from the NE. ¼ Sec. 36, Tp. 3, Rge. 1, W. 4th Mer., on April 29, 1914.

*Records available.*—August 31, 1912, to October 31, 1914.

*Gauge.*—Vertical staff. Elevation of zero of gauge at original station (records from August 31, 1912, to April 28, 1914) 87.22 feet; at new station from April 28, 1914, to October 31, 1914. Elevation of zero of gauge 89.31 feet.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet. Located 6½ feet west of the I.P. stake and 387 feet southwest of Hester's house.

*Channel.*—Practically permanent.

*Discharge measurements.*—Made by wading or with a weir.

*Winter flow.*—Station discontinued during winter season.

*Artificial control.*—There are many small beaver dams across the creek near this station both above the station and below, but as the channel is narrow they do not store much water and have very little effect upon the flow of the creek.

*Diversions.*—Geo. Legg and Jas. Mitchell use water for irrigation between this station and the station at Hartt's ranch.

*Remarks.*—Station discontinued during 1915 as the records were not considered of sufficient value to warrant the expense of maintenance.

M., M. M. AND J. M. SPANGLER DITCH FROM LODGE CREEK.

*Location.*—On the NW. ¼ Section 24, Tp. 2, Rge. 30, W. 3rd Mer., two miles downstream from dam and intake and one-half mile above reservoir No. 1.

*Gauge.*—Vertical staff driven into bed of ditch near the right bank. Zero of gauge maintained at 96.67 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark situated six feet from the gauge on the right bank. Assumed elevation, 100.00 feet.

*Channel.*—Composed of gumbo.

*Discharge measurements.*—Made with meter or weir. Initial point of soundings is the bench-mark.

*Observer.*—None.

*Remarks.*—This station was established August 2, 1915, by H. R. Carscallen. No water used after station was established.

M. LYNCH DITCH FROM LODGE CREEK.

*Location.*—On the NE. ¼ Sec. 19, Tp. 2, Rge. 29, W. 3rd Mer., about 500 feet downstream from flume over Lodge Creek.

*Gauge.*—Vertical staff driven into bed of ditch near right bank. Zero of gauge maintained at 96.75 feet.

*Bench-mark.*—Top of iron pin located on the right bank six feet from the gauge rod. Assumed elevation, 100.00 feet.

*Channel.*—Composed of gumbo.

*Discharge measurements.*—Made with meter or weir. Initial point for soundings is the bench-mark.

*Observer.*—M. Lynch.

*Remarks.*—This station was established August 9, 1915, by H. R. Carscallen. No water used since station was established.

D. A. HAMMOND DITCH.

*Location.*—On the NE. ¼ Sec. 5, Tp. 2, Rge. 29, W. 3rd Mer., about one-quarter of a mile upstream from two-way gate where ditch divides.

*Gauge.*—Vertical staff. The zero of the gauge was established and maintained at 98.58 feet.

*Bench-mark.*—Top of iron pin on the left bank of ditch, fifteen feet from gauge rod. Assumed elevation 100.00 feet.

*Channel.*—Composed of gumbo.

*Discharge measurements.*—Made by wading with current meter or with weir.

*Observer.*—D. A. Hammond.

*Remarks.*—This station was established August 2, 1915, by H. R. Carscallen and no water was used for irrigation after that date.

MRS. A. F. MOCK DITCH NEAR THELMA.

*Location.*—On the NW. ¼ Sec. 21, Tp. 7, Rge. 2, W. 4th Mer., one-half mile below intake.

*Gauge.*—Vertical staff driven into the bed of the ditch near the left bank. The elevation of the zero of gauge maintained at 97.24 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Composed of gravel and loam.

*Discharge measurements.*—Made with meter or weir.

*Observer.*—Adam Storm.

*Remarks.*—This station was established September 29, 1915, by H. R. Carscallen. No water was used for irrigation during 1915.

MUIR AND FRANTZEN DITCH FROM MIDDLE CREEK.

*Location.*—On the SW. ¼ Sec. 36, Tp. 5, Rge. 2, W. 4th Mer., about 100 feet upstream from intake of branch ditch.

*Records available.*—No water was used after station was established.

*Gauge.*—Vertical staff driven into bed of ditch near right bank. Elevation of zero of gauge maintained at 96.86 feet since establishment.

*Bench-mark.*—Top of iron stake on the right bank, 8 feet from the gauge rod.

*Channel.*—Composed of gumbo.

*Discharge measurements.*—Made with meter or with a weir.

*Artificial control.*—A control made of small rock was built 15 feet below the gauge.

*Observer.*—Ole Frantzen.

*Remarks.*—This station was established July 6, 1915, by H. R. Carscallen.

LINK'S EAST DITCH, NORTH BRANCH, FROM DRY COULEE.

*Location.*—On the SW. ¼ Sec. 32, Tp. 5, Rge. 1, W. 4th Mer., one hundred and ten feet from forks of ditch.

*Gauge.*—Vertical staff driven into the bed of the ditch near the left bank. Elevation of zero maintained at 99.07 feet since establishment.

*Bench-mark.*—The bench-mark for this station is the same as for the other two stations in Link's ditches and is located at the station on the South Branch of the East Ditch. Assumed elevation, 100.00 feet.

*Channel.*—Composed of gumbo.

*Discharge measurements.*—Made with a meter or with a weir.

*Observer.*—H. C. Link.

*Remarks.*—This station was established July 25, 1914, by J. A. Tom.

LINK'S EAST DITCH, SOUTH BRANCH, FROM DRY COULEE.

*Location.*—On the SW. ¼ Sec. 32, Tp. 5, Rge. 1, W. 4th Mer., sixty feet from forks of ditch.

*Gauge.*—Vertical staff driven into the bed of the ditch near the left bank. Zero of gauge maintained at 97.32 feet since establishment.

*Bench-mark.*—Top of a three-quarter of an inch iron post near the gauge rod on the right bank. Assumed elevation, 100.00 feet.

*Channel.*—Composed of gumbo.

*Discharge measurements.*—Made with meter or weir.

*Observer.*—H. C. Link.

*Remarks.*—This station was established July 25, 1914, by J. A. Tom.

LINK'S WEST DITCH FROM DRY COULEE.

*Location.*—On the SW. ¼ Sec. 32, Tp. 5, Rge. 1, W. 4th Mer., about one hundred feet from the headgate.

*Gauge.*—Vertical staff driven into the bed of the ditch near the right bank. Zero of gauge maintained at 100.07 feet since establishment.

*Bench-marks.*—Same as for Link's East Ditch, South Branch. Assumed elevation, 100 00 feet.

*Channel.*—Composed of gumbo with stones.

*Discharge measurements.*—Made with a meter or weir.

*Observer.*—H. C. Link.

*Remarks.*—This station was established July 25, 1914, by J. A. Tom.

MIDDLE CREEK AT MACKINNON'S RANCH.

*Location.*—On the SW. ¼ Sec. 35, Tp. 5, Rge. 1, W. 4th Mer., at Angus MacKinnon's ranch.

*Records available.*—From June 21, 1910, to April 17, 1915.

*Gauge.*—Vertical staff. Zero of gauge maintained at 91 49 feet during 1910–11. Zero of gauge maintained at 91 57 feet during 1912. Zero of gauge maintained at 91 47 feet during 1913–15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100 00 feet.

*Channel.*—Practically permanent.

*Winter flow.*—Station discontinued during winter season.

*Observer.*—A. D. MacKinnon.

*Remarks.*—Gauge records at this station discontinued on April 17.

DISCHARGE MEASUREMENTS of Middle Creek at MacKinnon's Ranch, in 1915.

| Date. | Engineer. | Width | Area of Section | Mean Velocity | Gauge Height | Discharge |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 20 | H. W. Rowley | *a* | | | 0.84 | 1.46 |
| June 7 | do | *a* | | | 0.64 | 0.71 |
| Aug. 18 | do | 14 | 4.20 | 1.10 | 1.15 | 4.6[illegible] |
| Sept. 10 | do | *a* | | | 0.45 | 0.7[illegible] |
| Oct. 4 | do | *a* | | | 0.[illegible] | 0.9[illegible] |

*a* Weir measurement

DAILY GAUGE HEIGHT AND DISCHARGE of Middle Creek at MacKinnon's Ranch, for 1915.

| Day. | March. | | April. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 3.31 | 50.0 |
| 2 | ..... | ..... | 3.91 | 68.0 |
| 3 | ..... | ..... | 6.71 | 152.0 |
| 4 | ..... | ..... | 5.71 | 122.0 |
| 5 | ..... | ..... | 5.91 | 128.0 |
| 6 | ..... | ..... | 5.86 | 127.0 |
| 7 | ..... | ..... | 2.53 | 28.0 |
| 8 | ..... | ..... | 2.33 | 22.0 |
| 9 | ..... | ..... | 2.01 | 15.1 |
| 10 | ..... | ..... | 1.83 | 11.7 |
| 11 | ..... | ..... | 1.71 | 9.8 |
| 12 | ..... | ..... | 1.49 | 6.8 |
| 13 | ..... | ..... | 1.25 | 4.2 |
| 14 | ..... | ..... | 1.02 | 2.4 |
| 15 | ..... | ..... | 1.53 | 7.3 |
| 16 | ..... | ..... | 1.44 | 6.2 |
| 17 | ..... | ..... | 1.24*a* | 4.2 |
| 18 | ..... | ..... | ..... | ..... |
| 19 | ..... | ..... | ..... | ..... |
| 20 | ..... | ..... | ..... | ..... |
| 21 | ..... | ..... | ..... | ..... |
| 22 | 3.86 | 67 | ..... | ..... |
| 23 | 3.90 | 68 | ..... | ..... |
| 24 | 5.48 | 115 | ..... | ..... |
| 25 | 4.51 | 86 | ..... | ..... |
| 26 | 3.84 | 66 | ..... | ..... |
| 27 | 3.25 | 40 | ..... | ..... |
| 28 | 3.11 | 44 | ..... | ..... |
| 29 | 3.02 | 42 | ..... | ..... |
| 30 | 2.93 | 39 | ..... | ..... |
| 31 | 2.71 | 32 | ..... | ..... |

*a* Station discontinued.

MONTHLY DISCHARGE of Middle Creek at MacKinnon's Ranch, for 1915.

(Drainage area 121 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (22–31) | 115 | 32.0 | 60 | 0.498 | 0.18 | 1,188 |
| April (1–17) | 152 | 2.4 | 45 | 0.371 | 0.23 | 1,517 |
| The period | ..... | ..... | ..... | ..... | 0.41 | 2,705 |

Station discontinued April 17.

MIDDLE CREEK AT ROSS' RANCH.

*Location.*—On the SW. ¼ Sec. 30, Tp. 5, Rge. 29, W. 3rd Mer., at Maurice Ross' ranch.

*Records available.*—From July 20, 1909, to October 31, 1915.

*Gauge.*—Vertical staff. Zero of gauge maintained at 3,291.61 during 1909–10. Zero of gauge maintained at 3,290.99 during 1911; zero of gauge maintained at 3,290.98 during 1912–15.

*Bench-mark.*—Permanent iron bench-mark. Elevation, 3,297.37 feet above sea level. (Irrigation Surveys.)

*Channel.*—Practically permanent.

*Discharge measurements.*—Made by wading or with a weir.

*Winter flow.*—Station discontinued during winter season.

*Artificial control.*—The flow at this station is regulated to some extent by two dams, one at W. X. Wright's and the other at MacKinnon's ranch.

*Diversions.*—Water is diverted for irrigation above this station by W. X. Wright and Angus MacKinnon.

*Observer.*—Mrs. W. M. Ross.

DISCHARGE MEASUREMENTS of Middle Creek at Ross' Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 22 | H. R. Carscallen | 33.0 | 62.00 | 1.30 | 3.41*a* | 81.00 |
| Mar. 23 | do | 62.0 | 109.00 | 1.33 | 3.64*a* | 145.00 |
| Mar. 27 | do | 17.5 | 50.00 | 2.86 | 3.33 | 144.00 |
| April 1 | do | 22.2 | 26.00 | 1.56 | 1.97 | 40.00 |
| April 3 | do | 30.2 | 55.00 | 1.84 | 2.88 | 101.00 |
| April 5 | do | 183.0 | 253.00 | 1.68 | 4.77 | 425.00 |
| April 9 | do | 13.4 | 18.00 | 1.38 | 1.74 | 26.00 |
| April 20 | H. W. Rowley | ....*b* | .... | .... | 0.74 | 0.81 |
| April 26 | do | ....*b* | .... | .... | 0.67 | 0.58 |
| May 10 | do | ....*b* | .... | .... | 0.65 | 0.49 |
| June 7 | do | ....*b* | .... | .... | 0.67 | 0.44 |
| June 26 | do | ....*b* | .... | .... | 0.67 | 0.44 |
| June 28 | do | ....*b* | .... | .... | 0.64 | 0.22 |
| July 21 | do | 6.0 | 2.20 | 0.91 | 0.90 | 2.10 |
| Aug. 17 | do | ....*b* | .... | .... | 0.64 | 0.22 |
| Aug. 18 | do | 51.0 | 164.00 | 0.90 | 3.38 | 148.00 |
| Sept. 10 | do | ....*b* | .... | .... | 0.64 | 0.39 |
| Oct. 4 | do | ....*b* | .... | .... | 0.64 | 0.40 |

*a* Gauge heights affected by ice.
*b* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Middle Creek at Ross' Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | .... | .... | 2.05 | 45.00 | 0.67 | 0.46 | 0.72 | 0.71 |
| 2 | .... | .... | 2.25 | 57.00 | 0.67 | 0.46 | 0.82 | 1.38 |
| 3 | .... | .... | 4.79 | 431.00 | 0.67 | 0.46 | 0.92 | 2.40 |
| 4 | .... | .... | 4.82 | 440.00 | 0.67 | 0.46 | 0.85 | 1.65 |
| 5 | .... | .... | 4.62 | 381.00 | 0.67 | 0.46 | 0.70 | 0.59 |
| 6 | .... | .... | 3.76 | 196.00 | 0.67 | 0.46 | 0.68 | 0.50 |
| 7 | .... | .... | 3.22 | 131.00 | 0.67 | 0.46 | 0.67 | 0.46 |
| 8 | .... | .... | 2.42 | 67.00 | 0.67 | 0.46 | 0.67 | 0.46 |
| 9 | .... | .... | 1.66 | 25.00 | 0.67 | 0.46 | 0.67 | 0.46 |
| 10 | .... | .... | 1.13 | 16.20 | 0.67*b* | 0.46 | 0.67 | 0.46 |
| 11 | .... | .... | 1.33 | 12.90 | 0.67 | 0.46 | 0.67 | 0.46 |
| 12 | .... | .... | 1.27 | 11.10 | 0.67 | 0.46 | 0.68 | 0.50 |
| 13 | .... | .... | 1.13 | 6.90 | 0.68 | 0.50 | 0.67 | 0.46 |
| 14 | .... | .... | 1.01 | 4.60 | 0.70 | 0.59 | 0.67 | 0.46 |
| 15 | .... | .... | 0.99 | 3.40 | 0.76 | 0.96 | 0.67 | 0.46 |
| 16 | .... | .... | 0.99 | 3.40 | 0.72 | 0.71 | 0.67 | 0.46 |
| 17 | .... | .... | 0.99 | 3.40 | 0.69 | 0.55 | 0.68 | 0.50 |
| 18 | .... | .... | 0.99 | 3.40 | 0.68 | 0.50 | 0.67 | 0.46 |
| 19 | .... | .... | 0.97 | 3.20 | 0.67 | 0.46 | 0.68 | 0.50 |
| 20 | .... | .... | 0.73 | 0.77 | 0.67 | 0.46 | 0.68 | 0.50 |
| 21 | 2.94*c* | 50 | 0.70 | 0.59 | 0.67 | 0.46 | 0.67 | 0.46 |
| 22 | 3.41*c* | 81 | 0.69 | 0.55 | 0.67 | 0.46 | 0.67 | 0.46 |
| 23 | 3.64*c* | 145 | 0.69 | 0.55 | 0.67 | 0.46 | 0.67 | 0.46 |
| 24 | 4.04 | 203 | 0.69 | 0.55 | 0.67 | 0.46 | 0.67 | 0.46 |
| 25 | 4.49*c* | 301 | 0.69 | 0.55 | 0.67 | 0.46 | 0.67 | 0.46 |
| 26 | 4.19*c* | 256 | 0.67 | 0.46 | 0.68 | 0.50 | 0.68 | 0.50 |
| 27 | 3.04 | 115 | 0.67 | 0.46 | 0.68 | 0.50 | 0.64 | 0.33 |
| 28 | 2.38 | 65 | 0.67*a* | 0.46 | 0.67 | 0.46 | 0.64 | 0.33 |
| 29 | 2.02 | 43 | 0.67 | 0.46 | 0.70 | 0.59 | 0.66 | 0.41 |
| 30 | 1.66 | 25 | 0.67 | 0.46 | 0.68 | 0.50 | 0.64 | 0.33 |
| 31 | 2.06 | 46 | | | 0.70 | 0.59 | | |

*a* to *b* Gauge heights interpolated.
*c* Ice conditions

DAILY GAUGE HEIGHT AND DISCHARGE of Middle Creek at Ross' Ranch, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 0.64 | 0.33 | 0.66 | 0.41 | 0.62 | 0.24 | 65 | 0.37 |
| 2 | 0.64 | 0.33 | 0.66 | 0.41 | 0.64 | 0.3 | 0.65 | 0.37 |
| 3 | 0.64 | 0.33 | 0.64 | 0.33 | 0.66 | 0.41 | 0.65 | 0.37 |
| 4 | 0.64 | 0.33 | 0.64 | 0.33 | 0.64 | 0.33 | 0.65 | 0.37 |
| 5 | 0.64 | 0.33 | 0.64 | 0.33 | 0.64 | 0.33 | 0.65 | 0.37 |
| 6 | 0.64 | 0.33 | 0.64 | 0.33 | 0.64 | 0.33 | 0.65 | 0.37 |
| 7 | 0.82 | 1.38 | 0.64 | 0.33 | 0.64 | 0.33 | 0.65 | 0.37 |
| 8 | 0.77 | 1.02 | 0.64 | 0.33 | 0.64 | 0.33 | 0.65 | 0.37 |
| 9 | 0.65 | 0.37 | 0.64 | 0.33 | 0.64 | 0.33 | 0.65 | 0.37 |
| 10 | 0.64 | 0.33 | 0.63 | 0.28 | 0.64 | 0.33 | 0.65 | 0.37 |
| 11 | 0.64 | 0.33 | 0.61 | 0.19 | 0.64 | 0.33 | 0.65 | 0.37 |
| 12 | 0.64 | 0.33 | 0.60 | 0.15 | 0.66 | 0.41 | 0.65 | 0.37 |
| 13 | 0.64 | 0.33 | 0.60 | 0.15 | 0.74 | 0.83 | 0.65 | 0.37 |
| 14 | 1.32 | 12.60 | 0.60 | 0.15 | 0.67 | 0.46 | 0.65 | 0.37 |
| 15 | 1.45 | 17.00 | 0 60 | 0.15 | 0.66 | 0.41 | 0.65 | 0.37 |
| 16 | 0.98 | 3.30 | 0.60 | 0.15 | 0.65 | 0.37 | 0.65 | 0.37 |
| 17 | 1.00 | 3.60 | 0.60 | 0.15 | 0.64 | 0.33 | 0.65 | 0.27 |
| 18 | 1.27 | 11.10 | 3.11 | 121.00 | 0.65 | 0.37 | 0.65 | 0.37 |
| 19 | 1.15 | 7.50 | 1.68 | 26.00 | 0.65 | 0.37 | 0.65 | 0.37 |
| 20 | 1.08 | 5.50 | 3.20 | 129.00 | 0.65 | 0.37 | 0.65 | 0.37 |
| 21 | 0.92 | 2.40 | 2.82 | 97.00 | 0.65 | 0.37 | 0.65 | 0.37 |
| 22 | 0.86 | 1.74 | 1.80 | 32.00 | 0.65 | 0.37 | 0.65 | 0.37 |
| 23 | 0.76 | 0.96 | 1.50 | 19.00 | 0.65 | 0.37 | 0.65 | 0.37 |
| 24 | 0.75 | 0.89 | 0.94 | 2.70 | 0.65 | 0.37 | 0.65 | 0.37 |
| 25 | 0.73 | 0.77 | 0.76 | 0.96 | 0.65 | 0.37 | 0.65 | 0.37 |
| 26 | 0.72 | 0.71 | 0.70 | 0.59 | 0.65 | 0.37 | 0.65 | 0.37 |
| 27 | 0.70 | 0.59 | 0.64 | 0.33 | 0.65 | 0.37 | 0.65 | 0.37 |
| 28 | 0.70 | 0.59 | 0.63 | 0.28 | 0.65 | 0.37 | 0.64 | 0.33 |
| 29 | 0.70 | 0.59 | 0.62 | 0.24 | 0.65 | 0.37 | 0.64 | 0.33 |
| 30 | 0.72 | 0.71 | 0.62 | 0.24 | 0.65 | 0.37 | 0.64 | 0.33 |
| 31 | 0.70 | 0.59 | 0.62 | 0.24 | ..... | ..... | 0.64 | 0.33 |

MONTHLY DISCHARGE of Middle Creek at Ross' Ranch, for 1915.

(Drainage area 162 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (21-31) | 301.00 | 25.00 | 121.00 | 0.74700 | 0.310 | 2,637 |
| April | 440.00 | 0.46 | 62.00 | 0.38300 | 0.430 | 3,689 |
| May | 0.96 | 0.46 | 0.51 | 0.00315 | 0.004 | 31 |
| June | 2.40 | 0.33 | 0.60 | 0.00370 | 0.004 | 36 |
| July | 17.00 | 0.33 | 2.50 | 0.01540 | 0.020 | 154 |
| August | 129.00 | 0.15 | 14.00 | 0.08640 | 0.100 | 861 |
| September | 0.83 | 0.24 | 0.37 | 0.00228 | 0.003 | 23 |
| October | 0.37 | 0.33 | 0.36 | 0.00222 | 0.003 | 22 |
| The period | ..... | ..... | ..... | ..... | 0 87 | 7,453 |

### B. A. JAHN DITCH FROM MIDDLE CREEK.

*Location.*—On the SE. ¼ Sec. 8, Tp. 4, Rge. 29, W. 3rd Mer., 700 feet downstream from intake of ditch.

*Gauge.*—Vertical staff driven into bed of ditch near right bank. Zero of gauge maintained at 95.45 feet.

*Bench-mark.*—Top of iron stake ten feet from gauge rod on left bank. Assumed elevation, 100.00 feet.

*Channel.*—Composed of gumbo.

*Discharge measurements.*—Made with weir or meter. Initial point for sounding is the bench-mark.

*Observer.*—B. A. Jahn.

*Remarks.*—This station was established July 31, 1915, by H. R. Carscallen. No water used after station was established.

### W. B. GREGG DITCH FROM MIDDLE CREEK.

*Location.*—On the NE. ¼ Sec. 34, Tp. 3, Rge. 29, W. 3rd Mer., one mile downstream from intake of B. A. Jahn's ditch near two-way gate where B. A. Jahn diverts water for irrigation.

*Gauge.*—Vertical staff driven into bed of ditch near right bank. Zero of gauge maintained at 96.20 feet since establishment.

*Bench-mark.*—Top of iron post, 12 feet from gauge rod, on the right bank. Assumed elevation, 100.00 feet.

*Channel.*—Composed of gumbo.

*Discharge measurements.*—Made with meter or weir. Initial point for soundings is bench-mark.

*Observer.*—B. A. Jahn.

*Remarks.*—This station was established July 30, 1915, by H. R. Carscallen. No water was used after the station was established.

### E. J. PEACHEY DITCH FROM MIDDLE CREEK.

*Location.*—On the SE. ¼ Sec. 4, Tp. 3, Rge. 29, W. 3rd Mer., one-half mile below dam and intake and in the flume along cut bank of Middle Creek.

*Gauge.*—Vertical staff nailed to right wall of flume. Zero of gauge maintained at 94.10 feet since establishment.

*Bench-mark.*—Top of iron post located 150 feet downstream from gauge on the right bank. Assumed elevation, 100.00 feet.

*Channel.*—Wooden flume.

*Discharge measurements.*—Made with meter or weir.

*Observer.*—E. J. Peachey.

*Remarks.*—This station was established July 29, 1915, by H. R. Carscallen. No water was used after the station was established.

### MIDDLE CREEK AT HAMMOND'S RANCH.

*Location.*—On the NE. ¼ Sec. 4, Tp. 2, Rge. 29, W. 3rd Mer., at D. A. Hammond's ranch.

*Records available.*—June 13, 1910, to October 31, 1915.

*Gauge.*—Vertical staff. Elevation of zero of gauge maintained at 87.48 feet, during 1910. Elevation of zero of gauge maintained at 87.60 feet, during 1911-15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Slightly shifting during high water stages.

*Discharge measurements.*—Made by wading or with a weir.

*Winter flow.*—Station discontinued during winter season.

*Diversions.*—Water is diverted above this station by W. B. Gregg, W. S. Peachey and E. J. Jahn.

*Observer.*—Mrs. D. A. Hammond.

DISCHARGE MEASUREMENTS of Middle Creek at Hammond's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 27 | H. W. Rowley | 30.0 | 106.00 | 1.90 | 5.42 | 203.00 |
| May 31 | do | 26.0 | 52.40 | 1.69 | 4.19*a* | 88.00 |
| April 5 | do | 40.0 | 200.00 | 2.10 | 7.10 | 422.00 |
| April 9 | do | 25.0 | 35.40 | 1.78 | 3.43 | 63.00 |
| April 12 | do | 19.0 | 17.60 | 1.47 | 2.66 | 26.00 |
| April 24 | do | 7.0 | 2.35 | 1.40 | 1.81 | 3.30 |
| May 22 | do | .....*b* | ..... | ..... | 1.55 | 0.12 |
| June 22 | do | .....*b* | ..... | ..... | 1.44 | 0.06 |
| July 16 | do | 23.0 | 21.80 | 0.95 | 2.75*a* | 21.00 |
| Aug. 10 | do | .....*b* | ..... | ..... | 1.49 | 1.81 |
| Sept. 29 | do | .....*b* | ..... | ..... | 1.25 | 0.69 |

*a* Gauge height affected by backwater from Lodge Creek.
*b* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Middle Creek at Hammond's Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 6.05 | 270.00 | 1.60 | 1.50 | 1.45 | 0.70 |
| 2 | ..... | ..... | 6.05 | 270.00 | 1.57 | 1.32 | 1.90 | 5.00 |
| 3 | ..... | ..... | 5.55 | 215.00 | 1.55 | 1.20 | 2.40 | 17.00 |
| 4 | ..... | ..... | 6.05 | 270.00 | 1.52 | 1.02 | 2.10 | 9.00 |
| 5 | ..... | ..... | 7.10 | 422.00 | 1.51 | 0.96 | 2.10 | 9.00 |
| 6 | ..... | ..... | 6.75 | 367.00 | 1.49 | 0.86 | 2.00 | 7.00 |
| 7 | ..... | ..... | 4.19 | 103.00 | 1.47 | 0.78 | 1.95 | 6.00 |
| 8 | ..... | ..... | 3.43 | 60.00 | 1.46 | 0.74 | 1.90 | 5.00 |
| 9 | ..... | ..... | 3.23 | 50.00 | 1.44 | 0.66 | 1.80 | 3.40 |
| 10 | ..... | ..... | 3.03 | 40.00 | 1.43 | 0.62 | 1.70 | 2.30 |
| 11 | ..... | ..... | 2.95 | 37.00 | 1.41 | 0.54 | 1.64 | 1.82 |
| 12 | ..... | ..... | 2.66 | 25.00 | 1.40 | 0.50 | 1.60 | 1.50 |
| 13 | ..... | ..... | 2.55 | 22.00 | 1.40 | 0.50 | 1.55 | 1.20 |
| 14 | ..... | ..... | 2.50 | 20.00 | 1.39 | 0.47 | 1.50 | 0.90 |
| 15 | ..... | ..... | 2.35 | 15.50 | 1.41 | 0.54 | 1.48 | 0.82 |
| 16 | ..... | ..... | 2.28 | 13.50 | 1.86 | 4.40 | 1.47 | 0.78 |
| 17 | ..... | ..... | 2.20 | 11.50 | 1.88 | 4.70 | 1.45 | 0.70 |
| 18 | ..... | ..... | 2.12 | 9.50 | 1.76 | 3.00 | 1.44 | 0.66 |
| 19 | ..... | ..... | 2.00 | 11.50 | 1.70 | 2.30 | 1.54 | 1.14 |
| 20 | ..... | ..... | 2.00 | 11.50 | 1.66 | 1.98 | 1.52 | 1.02 |
| 21 | ..... | ..... | 1.96 | 6.20 | 1.55 | 1.20 | 1.50 | 0.90 |
| 22 | 1.75*a* | 2.8 | 1.93 | 5.60 | 1.54 | 1.14 | 1.48 | 0.82 |
| 23 | 1.75 | 2.8 | 1.89 | 4.80 | 1.52 | 1.02 | 1.47 | 0.78 |
| 24 | 5.04 | 168.0 | 1.80 | 3.40 | 1.52 | 1.02 | 1.45 | 0.70 |
| 25 | 5.55 | 215.0 | 1.76 | 3.00 | 1.50 | 0.90 | 1.44 | 0.66 |
| 26 | 6.05 | 270.0 | 1.74 | 2.70 | 1.49 | 0.86 | 1.44 | 0.66 |
| 27 | 6.05 | 270.0 | 1.71 | 2.40 | 1.48 | 0.82 | 1.43 | 0.62 |
| 28 | 5.30 | 191.0 | 1.68 | 2.10 | 1.48 | 0.82 | 1.42 | 0.58 |
| 29 | 4.95 | 160.0 | 1.66 | 1.98 | 1.47 | 0.78 | 1.41 | 0.54 |
| 30 | 3.85 | 82.0 | 1.63 | 1.74 | 1.46 | 0.74 | 1.40 | 0.50 |
| 31 | 5.15 | 177.0 | ..... | ..... | 1.46 | 0.74 | ..... | ..... |

*a* Creek started to run March 22.

DAILY GAUGE HEIGHT AND DISCHARGE of Middle Creek at Hammond's Ranch, for 1915. —*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.40 | 0.50 | 1.56 | 1.26 | 1.48 | 0.82 | 1.22 | 0.04 |
| 2 | 1.38 | 0.44 | 1.53 | 1.08 | 1.45 | 0.70 | 1.21 | 0.02 |
| 3 | 1.35 | 0.35 | 1.48 | 0.82 | 1.49 | 0.86 | 1.21 | 0.02 |
| 4 | 1.32 | 0.26 | 1.42 | 0.58 | 1.47 | 0.78 | 1.20 | 0.00 |
| 5 | 1.32 | 0.26 | 1.40 | 0.50 | 1.45 | 0.70 | 1.20 | 0.00 |
| 6 | 1.31 | 0.23 | 1.35 | 0.35 | 1.44 | 0.66 | 1.19 | 0.00 |
| 7 | 1.30 | 0.20 | 1.31 | 0.23 | 1.43 | 0.62 | 1.19 | 0.00 |
| 8 | 1.40 | 0.50 | 1.29 | 0.18 | 1.42 | 0.58 | 1.19 | 0.00 |
| 9 | 1.38 | 0.44 | 1.26 | 0.12 | 1.40 | 0.50 | 1.19 | 0.00 |
| 10 | 1.34 | 0.32 | 1.23 | 0.06 | 1.40 | 0.50 | 1.60 | 1.50 |
| 11 | 1.33 | 0.29 | 1.22 | 0.04 | 1.39 | 0.47 | 1.55 | 1.20 |
| 12 | 1.32 | 0.26 | 1.21 | 0.02 | 1.38 | 0.44 | 1.52 | 1.02 |
| 13 | 1.95 | 6.00 | 1.20 | 0.00 | 1.38 | 0.44 | 1.50 | 0.90 |
| 14 | 1.98 | 6.60 | 1.20 | 0.00 | 1.37 | 0.41 | 1.47 | 0.78 |
| 15 | 4.05 | 94.00 | 1.19 | 0.00 | 1.36 | 0.38 | 1.46 | 0.74 |
| 16 | 2.75 | 29.00 | 1.19 | 0.00 | 1.36 | 0.38 | 1.45 | 0.70 |
| 17 | 3.70 | 73.00 | 1.19 | 0.00 | 1.36 | 0.38 | 1.44 | 0.66 |
| 18 | 2.70 | 27.00 | 1.19 | 0.00 | 1.35 | 0.35 | 1.44 | 0.66 |
| 19 | 2.40 | 17.00 | 1.19 | 0.00 | 1.35 | 0.35 | 1.43 | 0.62 |
| 20 | 2.25 | 12.80 | 3.55 | 65.00 | 1.34 | 0.32 | 1.45 | 0.70 |
| 21 | 2.15 | 10.20 | 2.90 | 35.00 | 1.32 | 0.26 | 1.45 | 0.70 |
| 22 | 2.08 | 8.60 | 4.05 | 94.00 | 1.30 | 0.20 | 1.43 | 0.62 |
| 23 | 2.06 | 7.00 | 3.40 | 58.00 | 1.28 | 0.16 | 1.39[a] | 0.47 |
| 24 | 1.97 | 6.40 | 2.60 | 23.00 | 1.27 | 0.14 | 1.35 | 0.35 |
| 25 | 1.90 | 5.00 | 2.20 | 11.50 | 1.26 | 0.12 | 1.35 | 0.35 |
| 26 | 1.95 | 6.00 | 1.80 | 3.40 | 1.25 | 0.10 | 1.35 | 0.35 |
| 27 | 1.88 | 4.70 | 1.65 | 1.90 | 1.24 | 0.08 | 1.34 | 0.32 |
| 28 | 1.70 | 2.30 | 1.60 | 1.50 | 1.23 | 0.06 | 1.34 | 0.32 |
| 29 | 1.65 | 1.90 | 1.58 | 1.38 | 1.23 | 0.06 | 1.34 | 0.32 |
| 30 | 1.62 | 1.66 | 1.55 | 1.20 | 1.22 | 0.04 | 1.34 | 0.32 |
| 31 | 1.60 | 1.50 | 1.50 | 0.90 | ..... | ..... | 1.33 | 0.29 |

*a* Gauge height interpolated.

MONTHLY DISCHARGE of Middle Creek at Hammond's Ranch, for 1915.

(Drainage area 315 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March | 270.00 | 0.00 | 50.00 | 0.15700 | 0.180 | 3,050 |
| April | 422.00 | 1.74 | 76.00 | 0.24100 | 0.270 | 4,522 |
| May | 4.70 | 0.47 | 1.25 | 0.00397 | 0.005 | 77 |
| June | 17.00 | 0.50 | 2.70 | 0.00857 | 0.010 | 161 |
| July | 94.00 | 0.20 | 10.50 | 0.03370 | 0.040 | 646 |
| August | 91.00 | 0.00 | 9.70 | 0.03080 | 0.040 | 596 |
| September | 0.86 | 0.01 | 0.40 | 0.00127 | 0.001 | 24 |
| October | 1.50 | 0.00 | 0.45 | 0.00143 | 0.002 | 28 |
| The period | | | | | 0.548 | 9,104 |

LODGE CREEK AT WILLOW CREEK POLICE DETACHMENT.

*Location.*—On the SE. ¼ Sec. 12, Tp. 1, Rge. 29, W. 3rd Mer., at the Willow Creek Police Detachment.

*Records available.*—From April 25, 1910, to October 31, 1915.

*Gauge.*—Vertical staff. Zero of gauge maintained at 2,722.98 feet during 1910. Zero of gauge maintained at 2,721.18 feet during 1911. Zero of gauge maintained at 2,721.05 feet during 1912–15.

*Bench-mark.*—Permanent iron bench-mark, located on the right bank, at the cable support. Elevation, 2,734.02 feet above mean sea level. (International Boundary Survey.)

*Channel.*—Practically permanent.

*Discharge measurements.*—Made at station from cable car, by wading or with a weir.

*Winter flow.*—Station discontinued during winter season.

*Observer.*—Chas. Hayes, March to May 22; Geo. J. Kroft, May 23 to June 14; W. H. Tudgay, June 15 to October 31.

DISCHARGE MEASUREMENTS of Lodge Creek at Willow Creek Police Detachment, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 25 | H. W. Rowley | 105 | 481.0 | 1.14 | 8.37 | 553.00 |
| Mar. 29 | do | 95 | 431.0 | 1.04 | 8.10 | 447.00 |
| April 1 | do | 94 | 294.0 | 3.25 | 6.57 | 957.00 |
| April 5 | do | 99 | 354.0 | 3.57 | 7.00 | 1,266.00 |
| April 10 | do | 38 | 61.4 | 2.05 | 3.01 | 126.00 |
| April 23 | do | 19 | 18.4 | 0.84 | 1.76 | 15.50 |
| May 22 | do | ....*a* | ..... | ..... | 1.41 | 2.20 |
| June 23 | do | 6 | 2.3 | 0.98 | 1.46 | 2.20 |
| July 16 | do | 48 | 108.0 | 2.49 | 4.06 | 270.00 |
| July 18 | do | 76 | 181.0 | 2.67 | 5.00 | 483.00 |
| Aug. 13 | do | ....*a* | ..... | ..... | 1.19 | 0.16 |
| Sept. 2 | do | 7 | 3.6 | 1.46 | 1.55 | 5.30 |
| Sept. 25 | do | ....*a* | ..... | ..... | 1.25 | 0.40 |
| Oct. 22 | do | ....*a* | ..... | ..... | 1.29 | 0.40 |

*a* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Lodge Creek at Willow Creek Police Detachment, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 6.57 | 960.00 | 1.37 | 1.38 | 1.28 | 0.47 |
| 2 | ..... | ..... | 6.63 | 993.00 | 1.33 | 0.90 | 1.34 | 1.00 |
| 3 | ..... | ..... | 6.89 | 1177.00 | 1.31 | 0.70 | 2.38 | 58.00 |
| 4 | ..... | ..... | 7.14 | 1401.00 | 1.29 | 0.54 | 1.90 | 22.00 |
| 5 | ..... | ..... | 6.87 | 1162.00 | 1.27 | 0.41 | 1.70 | 11.60 |
| 6 | ..... | ..... | 5.91 | 695.00 | 1.28 | 0.47 | 1.68 | 10.70 |
| 7 | ..... | ..... | 4.45 | 343.00 | 1.26 | 0.34 | 2.13 | 37.00 |
| 8 | ..... | ..... | 3.77 | 226.00 | 1.28 | 0.47 | 2.46 | 66.00 |
| 9 | ..... | ..... | 3.31 | 163.00 | 1.25 | 0.28 | 2.27 | 49.00 |
| 10 | ..... | ..... | 2.85 | 108.00 | 1.24 | 0.24 | 2.08 | 34.00 |
| 11 | ..... | ..... | 2.75 | 97.00 | 1.24 | 0.24 | 1.92 | 23.00 |
| 12 | ..... | ..... | 2.49 | 69.00 | 1.22 | 0.17 | 1.81 | 17.10 |
| 13 | ..... | ..... | 2.38 | 58.00 | 2.49 | 69.00 | 1.74 | 13.60 |
| 14 | ..... | ..... | 2.28 | 49.00 | 2.28 | 49.00 | 1.70 | 11.60 |
| 15 | ..... | ..... | 2.21 | 44.00 | 2.22 | 45.00 | 1.64 | 8.90 |
| 16 | ..... | ..... | 2.12 | 37.00 | 2.05 | 32.00 | 1.60 | 7.10 |
| 17 | ..... | ..... | 2.11 | 36.00 | 1.87 | 20.00 | 1.59 | 6.70 |
| 18 | ..... | ..... | 2.06 | 32.00 | 1.79*a* | 16.10 | 1.54 | 4.90 |
| 19 | ..... | ..... | 1.99 | 27.00 | 1.70*a* | 11.60 | 1.55 | 5.20 |
| 20 | ..... | ..... | 1.94 | 24.00 | 1.61*a* | 7.60 | 1.53 | 4.60 |
| 21 | ..... | ..... | 1.88 | 21.00 | 1.56*a* | 5.60 | 1.50 | 3.80 |
| 22 | ..... | ..... | 1.78 | 15.60 | 1.48*a* | 3.40 | 1.48 | 3.40 |
| 23 | ..... | ..... | 1.75 | 14.10 | 1.58 | 6.30 | 1.45 | 2.70 |
| 24 | 5.94*c* | 123*b* | 1.76 | 14.60 | 1.54 | 4.90 | 1.41 | 1.98 |
| 25 | 8.50 | 588*b* | 1.73 | 13.10 | 1.50 | 3.80 | 1.36 | 1.24 |
| 26 | 8.00 | 456*b* | 1.70 | 11.60 | 1.46 | 2.90 | 1.38 | 1.52 |
| 27 | 7.72 | 390*b* | 1.65 | 9.40 | 1.40 | 1.80 | 1.34 | 1.00 |
| 28 | 8.05 | 447*b* | 1.58 | 6.30 | 1.34 | 1.00 | 1.30 | 0.60 |
| 29 | 8.34 | 502*b* | 1.47 | 3.10 | 1.29 | 0.54 | 1.29 | 0.54 |
| 30 | 8.10 | 447*b* | 1.39 | 1.66 | 1.28 | 0.47 | 1.28 | 0.47 |
| 31 | 8.13 | 450*b* | ..... | ..... | 1.26 | 0.34 | ..... | ..... |

*a* Gauge heights interpolated.
*b* Ice conditions.
*c* Creek started to flow Mar. 24th.

DAILY GAUGE HEIGHT AND DISCHARGE of Lodge Creek at Willow Creek Police Detachment, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.26 | 0.34 | 1.58 | 6.30 | 1.50 | 3.80 | 1.24 | 0.24 |
| 2 | 1.23 | 0.21 | 1.52 | 4.40 | 1.54 | 4.90 | 1.24 | 0.24 |
| 3 | 1.20 | 0.10 | 1.46 | 2.90 | 1.52 | 4.40 | 1.23 | 0.21 |
| 4 | 1.18 | 0.08 | 1.44 | 2.50 | 1.48 | 3.40 | 1.23 | 0.21 |
| 5 | 1.18 | 0.08 | 1.40 | 1.80 | 1.45 | 2.70 | 1.23 | 0.21 |
| 6 | 1.18 | 0.07 | 1.36 | 1.24 | 1.44 | 2.50 | 1.22 | 0.17 |
| 7 | 1.18 | 0.07 | 1.34 | 1.00 | 1.40 | 1.80 | 1.21 | 0.14 |
| 8 | 1.28 | 0.47 | 1.30 | 0.60 | 1.40 | 1.80 | 1.21 | 0.14 |
| 9 | 1.20 | 0.10 | 1.25 | 0.28 | 1.38 | 1.52 | 1.20 | 0.10 |
| 10 | 1.34 | 1.00 | 1.23 | 0.21 | 1.35 | 1.10 | 1.20 | 0.10 |
| 11 | 1.76 | 14.60 | 1.22 | 0.17 | 1.35 | 1.10 | 1.20 | 0.10 |
| 12 | 1.66 | 9.80 | 1.18 | 0.08 | 1.40 | 1.80 | 1.20 | 0.10 |
| 13 | 1.66 | 9.80 | 1.18 | 0.08 | 1.40 | 1.80 | 1.20 | 0.10 |
| 14 | 1.92 | 23.00 | 1.20 | 0.10 | 1.38 | 1.52 | 1.20 | 0.10 |
| 15 | 4.77 | 405.00 | 1.19 | 0.09 | 1.36 | 1.24 | 1.20 | 0.10 |
| 16 | 4.67 | 385.00 | 1.19 | 0.09 | 1.35 | 1.10 | 1.20 | 0.10 |
| 17 | 4.12 | 283.00 | 1.18 | 0.08 | 1.34 | 1.00 | 1.34 | 1.00 |
| 18 | 4.71 | 393.00 | 1.14 | 0.04 | 1.34 | 1.00 | 1.32 | 0.80 |
| 19 | 3.70 | 216.00 | 1.12 | 0.01 | 1.34 | 1.00 | 1.31 | 0.70 |
| 20 | 2.82 | 104.00 | 1.10 | 0.00 | 1.32 | 0.80 | 1.29 | 0.54 |
| 21 | 2.40 | 60.00 | 1.37 | 1.38 | 1.30 | 0.60 | 1.28 | 0.47 |
| 22 | 2.18 | 41.00 | 5.01 | 456.00 | 1.30 | 0.60 | 1.28 | 0.47 |
| 23 | 2.02 | 29.00 | 3.02 | 127.00 | 1.28 | 0.47 | 1.28 | 0.47 |
| 24 | 1.92 | 23.00 | 2.30 | 51.00 | 1.27 | 0.41 | 1.28 | 0.47 |
| 25 | 1.84 | 18.80 | 2.10 | 35.00 | 1.26 | 0.34 | 1.26 | 0.34 |
| 26 | 1.80 | 16.60 | 1.92 | 23.00 | 1.25 | 0.28 | 1.25 | 0.28 |
| 27 | 1.74 | 12.60 | 1.82 | 17.70 | 1.25 | 0.28 | 1.25 | 0.28 |
| 28 | 1.68 | 10.70 | 1.72 | 12.60 | 1.25 | 0.28 | 1.25 | 0.28 |
| 29 | 1.65 | 9.30 | 1.66 | 9.80 | 1.24 | 0.24 | 1.25 | 0.28 |
| 30 | 1.66 | 9.80 | 1.60 | 7.10 | 1.26 | 0.34 | 1.25 | 0.28 |
| 31 | 1.62 | 8.00 | 1.54 | 4.90 | ..... | ..... | 1.25 | 0.28 |

MONTHLY DISCHARGE of Lodge Creek at Willow Creek Police Detachment, for 1915.

(Drainage area 823 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area | Total in Acre-feet. |
| March (24-31) | 588.00 | 0.00 | 110.00 | 0.13400 | 0.150 | 6,764 |
| April | 1101.00 | 1.66 | 260.00 | 0.31600 | 0.350 | 15,471 |
| May | 69.00 | 0.17 | 9.30 | 0.01130 | 0.010 | 572 |
| June | 66.00 | 0.17 | 13.70 | 0.01670 | 0.020 | 815 |
| July | 405.00 | 0.07 | 67.00 | 0.08140 | 0.090 | 4,129 |
| August | 456.00 | 0.00 | 25.00 | 0.03040 | 0.040 | 1,537 |
| September | 1.90 | 0.24 | 1.17 | 0.00170 | 0.002 | 87 |
| October | 1.00 | 0.10 | 0.30 | 0.00050 | 0.000 | 18 |
| The period | ..... | ..... | ..... | ..... | 0.682 | 24,384 |

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Lodge Creek drainage basin, in 1915.

| Date. | Engineer. | Stream. | Location. | Discharge. | |
|---|---|---|---|---|---|
| | | | | *Imperial gallons per 24 hours.* | *Sec.-ft.* |
| Sept. 11 | H. W. Rowley | Adam's Spring | NW. 32-5-1-4 | 324 | 0.000602 |
| Sept. 11 | do | Link's Spring | SW. 32-5-1-4 | 1,072 | 0.001990 |
| Oct. 5 | do | Adam's Spring | NW. 32-5-1-4 | 312 | 0.000579 |
| Oct. 5 | do | Link's Spring | SW. 32-5-1-4 | 861 | 0.001600 |

## BATTLE CREEK DRAINAGE BASIN.

### *General Description.*

Battle Creek rises in Township 8, Range 2, West of the 4th Meridian, and flows in an easterly direction for about eight miles, where it crosses the 4th Meridian, then turns in a southeasterly direction and crosses the international boundary at Section 3, Township 1, Range 26, West of the 3rd Meridian, eventually emptying into Milk River near Chinook, Montana.

As is characteristic of the streams in this locality, the valley is narrow and deep near the source and gradually broadens out into large flats and meadows. These large flats are first noticed in the vicinity of Battle Creek Post Office. Near the head of the stream the valley is well wooded with medium sized timber, but this diminishes to a growth of willow brush along the banks and finally disappears altogether.

The chief tributaries of Battle Creek are Tenmile Creek, joining it in Section 4, Township 6, Range 29, West of the 3rd Meridian, and Sixmile Coulee, joining it in Section 21, Township 6, Range 29, West of the 3rd Meridian. Stations have been established on both of these streams.

There are three stations on Battle Creek at the following places: Nash's ranch, Wilkes' ranch, and Tenmile Police Detachment.

Although it will be several years before it reaches its fullest development, the irrigation of the flats along the creeks is increasing every year. This, it is expected, will result in a more uniform flow in the creek, as a certain amount of the water diverted by the irrigation ditches will be returned to the creek through seepage.

### WOOD AND ANDERSON DITCH NEAR COULEE.

*Location.*—On the NE. ¼ Sec. 21, Tp. 7, Rge. 29, W. 3rd Mer., about 150 feet west of ranch house.

*Records available.*—For the irrigation season of 1915.

*Gauge.*—Vertical staff driven into the bed of the ditch near the right bank. Zero elevation maintained at 96.80 feet, since establishment.

*Bench-mark.*—Top of wooden stake located opposite the gauge rod on the left bank. Assumed elevation, 100.00 feet.

*Artificial control.*—A permanent twenty-four inch sharp crested rectangular weir controls the flow at this station, located ten feet below the gauge. Elevation of crest maintained at 98.80 feet.

*Discharge measurements.*—Made with weir.

*Observer.*—M. D. Wood.

DAILY GAUGE HEIGHT AND DISCHARGE of Wood and Anderson Ditch near Coulee, for 1915.

| DAY. | May. | | June. | | July. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.13*b* | 0.31 | 2.13 | 0.31 |
| 2 | ..... | ..... | ..... | ..... | 2.12 | 0.27 |
| 3 | ..... | ..... | ..... | ..... | 2.10 | 0.21 |
| 4 | ..... | ..... | ..... | ..... | 2.10 | 0.21 |
| 5 | ..... | ..... | ..... | ..... | 2.11 | 0.24 |
| 6 | ..... | ..... | ..... | ..... | 2.10 | 0.21 |
| 7 | ..... | ..... | ..... | ..... | 2.11 | 0.24 |
| 8 | ..... | ..... | ..... | ..... | .....*b* | ..... |
| 9 | ..... | ..... | ..... | ..... | ..... | ..... |
| 10 | ..... | ..... | ..... | ..... | ..... | ..... |
| 11 | ..... | ..... | ..... | ..... | ..... | ..... |
| 12 | ..... | ..... | ..... | ..... | ..... | ..... |
| 13 | ..... | ..... | ..... | ..... | ..... | ..... |
| 14 | ..... | ..... | ..... | ..... | ..... | ..... |
| 15 | ..... | ..... | ..... | ..... | ..... | ..... |
| 16 | ..... | ..... | ..... | ..... | ..... | ..... |
| 17 | ..... | ..... | ..... | ..... | ..... | ..... |
| 18 | ..... | ..... | ..... | ..... | ..... | ..... |
| 19 | ..... | ..... | ..... | ..... | ..... | ..... |
| 20 | ..... | ..... | ..... | ..... | ..... | ..... |
| 21 | ..... | ..... | ..... | ..... | ..... | ..... |
| 22 | ..... | ..... | 2.12*a* | 0.27 | ..... | ..... |
| 23 | 2.20*a* | 0.58 | 2.16 | 0.42 | ..... | ..... |
| 24 | 2.22 | 0.67 | 2.16 | 0.42 | ..... | ..... |
| 25 | 2.19 | 0.54 | 2.14 | 0.34 | ..... | ..... |
| 26 | 2.23 | 0.72 | 2.13 | 0.31 | ..... | ..... |
| 27 | 2.10 | 0.21 | 2.13 | 0.31 | ..... | ..... |
| 28 | 2.13 | 0.31 | 2.14 | 0.34 | ..... | ..... |
| 29 | 2.24 | 0.76 | 2.13 | 0.31 | ..... | ..... |
| 30 | 2.12 | 0.27 | 2.13 | 0.31 | ..... | ..... |
| 31 | 2.14 | 0.34 | ..... | ..... | ..... | ..... |

*a* Headgate opened.
*b* Headgate closed.

MONTHLY DISCHARGE of Wood and Anderson Ditch near Coulee, for 1915.

| MONTH. | DISCHARGE IN SECOND-FEET. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | |
| May (23-31) | 0.72 | 0.21 | 0.49 | 9 |
| June (1, 22-30) | 0.42 | 0.27 | 0.37 | 6 |
| July (1-7) | 0.31 | 0.21 | 0.24 | 3 |
| The period | ..... | ..... | ..... | 18 |

WOOD AND ANDERSON WEST DITCH NEAR COULEE.

*Location.*—On the NE. ¼ Sec. 22, Tp. 7, Rge. 29, W. 3rd Mer., 375 feet below intake of ditch.

*Records available.*—No water was used during irrigation seasons of 1914 and 1915.

*Gauge.*—Vertical staff driven into the bed of the ditch near the right bank. Elevation of zero maintained at 97.54 feet since establishment of station.

*Bench-mark.*—Top of wooden stake located on left bank. Assumed elevation, 100,000 feet.

*Artificial control.*—A twenty-four inch sharp crested weir controls the flow at this station and is located ten feet below the gauge rod. The elevation of the crest is maintained at 99.12 feet.

*Discharge measurements.*—Made with weir.

*Observer.*—M. D. Wood.

WOOD AND ANDERSON EAST DITCH NEAR COULEE.

*Location.*—On the SE. ¼ Sec. 22, Tp. 7, Rge. 29, W. 3rd Mer., about two hundred feet below dam.

*Records available.*—For the irrigation season of 1915, during which the ditch was used for two days (May 24–25) with a total flow of three acre-feet.

*Gauge.*—Vertical staff driven into the bed of the ditch near the right bank. Elevation of zero maintained at 97.16 feet since establishment.

*Bench-mark.*—Top of a wooden stake located near the weir on the left bank. Assumed elevation, 100.00 feet.

*Channel.*—Composed of clay and gravel.

*Discharge measurements.*—Made by measuring head over 36-inch sharp crested rectangular weir which is permanently located ten feet below the gauge rod.

*Artificial control.*—36-inch sharp crested, rectangular weir located ten feet below gauge. Elevation of crest of weir maintained at 98.35 feet.

*Observer.*—M. D. Wood.

*Remarks.*—This station was established June 20, 1914, by J. A. Tom. No water was used during 1914 irrigation season.

F. L. MULL WEST DITCH NEAR COULEE.

*Location.*—On the NW. ¼ Sec. 24, Tp. 7, Rge. 29, W. 3rd Mer., about 900 feet below dam and intake.

*Records available.*—During the irrigation season of 1915 no water was used.

*Gauge.*—Vertical staff driven into the bed of ditch near left bank. Elevation of zero of gauge maintained at 96.02 since establishment.

*Bench-mark.*—Top of iron post located on the right bank near gauge. Assumed elevation, 100.00 feet.

*Channel.*—Composed of sand and gravel.

*Discharge measurements.*—Made by measured head over permanent sharp crested weir, located 10 feet below gauge rod. Elevation of crest of weir maintained at 96.90 feet.

*Observer.*—Fred Mull.

*Remarks.*—This station was established June 9, 1915, by H. R. Carscallen.

F. L. MULL EAST DITCH NEAR COULEE.

*Location.*—On the NW. ¼ Sec. 24, Tp. 7, Rge. 29, W. 3rd Mer., about 800 feet below dam and intake of irrigation ditch.

*Records available.*—For the irrigation season of 1915, during which no water was used.

*Gauge.*—Vertical staff. Zero of gauge maintained at 98.53 feet since establishment.

*Bench-mark.*—Top of iron post on the right bank near gauge and ten feet upstream from permanent weir.

*Channel.*—Composed of sand and gravel.

*Discharge measurements.*—Made by measured head on permanent 24 inch weir located 10 feet below gauge rod.

*Observer.*—Fred Mull.

*Remarks.*—This station was established June 9, 1915, by H. R. Carscallen.

J. E. PARSONAGE DITCH NEAR BATTLE CREEK.

*Location.*—On the SW. ¼ Sec. 3, Tp. 7, Rge. 29, W. 3rd Mer., about 70 feet upstream from bridge on road allowance between Townships 6 and 7, Range 29.

*Gauge.*—Vertical staff, driven into bed of ditch about ten feet upstream from permanent weir. Zero of gauge maintained at 95.86 feet.

*Bench-mark.*—Top of three-quarters inch iron post, 15 feet from gauge on the right bank. Assumed elevation, 100.00 feet.

*Channel.*—Composed of sand and gravel.

*Discharge measurements.*—Made by measured head over crest of permanent sharp crested 24 inch rectangular weir. Elevation of crest of weir maintained at 96.96 feet.

*Observer.*—J. E. Parsonage.

*Remarks.*—This station was established June 9, 1915, by H. R. Carscallen. No water was used during 1915.

SPANGLER DITCH FROM SIXMILE COULEE.

*Location.*—On the SW. ¼ Sec. 6, Tp. 7, Rge. 28, W. 3rd Mer., at Spangler's ranch.

*Records available.*—For the irrigation seasons of 1912–15.

*Gauge.*—Vertical staff. Zero of gauge has been maintained at 96.57 feet since establishment.

*Bench-mark.*—The top of the I. P. stake. Assumed elevation, 100.00 feet.

*Channel.*—Composed of soft clay.

*Discharge measurements.*—Made by wading or with a weir.

*Observer.*—J. M. Spangler.

*Remarks.*—Measurements of discharge were not obtained in 1915 and the daily discharges shown are obtained by applying the 1914 curve.

DAILY GAUGE HEIGHT AND DISCHARGE of Spangler Ditch from Sixmile Coulee, for 1915.

| Day. | May. | | June. | | July. | | August. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | | | | | | | 1.45 | 0.64 |
| 2 | | | | | | | 1.40 | 0.40 |
| 3 | | | | | | | 1.35*b* | 0.23 |
| 4 | | | | | | | | |
| 5 | | | | | 1.77*a* | 4.70 | | |
| 6 | | | | | 1.75 | 4.40 | | |
| 7 | | | | | 1.75 | 4.40 | | |
| 8 | | | | | 1.78*b* | 4.80 | | |
| 9 | | | | | | | | |
| 10 | 1.57*a* | 1.79*c* | | | | | | |
| 11 | 1.56 | 1.67 | | | | | | |
| 12 | 1.54 | 1.45 | | | | | | |
| 13 | 1.57*b* | 1.79 | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | 1.67*a* | 3.20 | | |
| 24 | | | | | 1.65 | 2.90 | | |
| 25 | | | | | 1.63 | 2.60 | | |
| 26 | | | | | 1.66 | 3.00 | | |
| 27 | | | | | 1.68 | 3.40 | | |
| 28 | | | | | 1.66 | 3.00 | | |
| 29 | | | | | 1.66 | 3.00 | | |
| 30 | | | | | 1.66 | 3.00 | | |
| 31 | | | | | 1.58 | 1.91 | | |

*a* Headgates opened.
*b* Headgates closed.
*c* No discharge measurements made in 1915. Discharges from 1914 records.

MONTHLY DISCHARGE of Spangler Ditch from Sixmile Coulee, for 1915

| Month | Discharge in Second-Feet | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| May (10–13) | 1.79 | 1.45 | 1.68 | 13 |
| June | 0.00 | 0.00 | 0.00 | Nil. |
| July (5–8, 23–31) | 4.80 | 1.91 | 3.40 | 81 |
| August (1–3) | 0.64 | 0.23 | 0.42 | 3 |
| The period | | | | 1[illegible] |

SIXMILE COULEE AT SPANGLER'S RANCH.

*Location.*—On the SW. ¼ of Sec. 6, Tp. 7, Rge. 28, W. 3rd Mer., near Mr. Spangler's house. The present station is 850 feet north of the former station established July 4, 1911.

*Records available.*—At former station 850 feet downstream from July 3, 1911, to November 7, 1911; at present station April 13, 1912, to October 31, 1915.

*Gauge.*—Vertical staff. Zero of gauge maintained at 90.68 feet (original station), during 1911; zero of gauge maintained at 96.73 feet during 1912–15.

*Bench-mark.*—Permanent iron bench-mark located on the left bank 850 feet below gauge rod.

*Discharge measurements.*—Made by wading or with weir.

*Artificial control.*—Permanent 6 foot weir installed 175 feet below gauge, September 8, 1915, elevation of crest 98.99 feet.

*Winter flow.*—Station discontinued during winter season.

*Diversions.*—Water is diverted by J. M. Spangler for irrigation one-half mile above.

*Observer.*—D. B. Spangler.

DISCHARGE MEASUREMENTS of Sixmile Coulee at Spangler's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq.ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 26 | H. R. Carscallen | 8.2 | 10.8 | 0.78 | 3.45 | 8.50 |
| April 2 | do | 8.5 | 8.4 | 1.14 | 2.58 | 9.60 |
| April 17 | H. W. Rowley | 9.0 | 6.6 | 1.24 | 2.20 | 8.20 |
| May 19 | do | 9.0 | 6.9 | 1.47 | 2.39 | 10.20 |
| June 5 | do | 10.0 | 18.2 | 1.35 | 3.60 | 25.00 |
| June 25 | do | 8.0 | 4.2 | 1.24 | 2.10 | 5.20 |
| Aug. 4 | do | 7.0 | 4.1 | 0.71 | 2.02 | 2.90 |
| Aug. 28 | do | .....a | ..... | ..... | 1.75 | 0.55 |
| Sept. 18 | do | 6.0 | 2.6 | 1.35 | 2.50 | 3.50 |
| Oct. 16 | do | 7.0 | 3.9 | 1.38 | 2.60 | 5.40 |
| Nov. 5 | do | 6.0 | 2.8 | 0.82 | 2.43 | 2.30 |

*a* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Sixmile Creek at Spangler's Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.34 | 3.30 | 1.74 | 2.70 | 2.01 | 5.60 |
| 2 | ..... | ..... | 2.89 | 11.10 | 1.73 | 2.60 | 2.23 | 8.30 |
| 3 | ..... | ..... | 4.17 | 32.00 | 1.73 | 2.60 | 2.59 | 12.90 |
| 4 | ..... | ..... | 3.67 | 23.00 | 1.76 | 2.90 | 3.33 | 20.00 |
| 5 | ..... | ..... | 4.47 | 38.00 | 1.76 | 2.90 | 3.57 | 24.00 |
| 6 | ..... | ..... | 4.01 | 30.00 | 1.77 | 3.00 | 4.41 | 41.00 |
| 7 | ..... | ..... | 3.61 | 24.00 | 1.78 | 3.10 | 4.03 | 34.00 |
| 8 | ..... | ..... | 3.20 | 17.70 | 1.76 | 2.90 | 3.56 | 24.00 |
| 9 | ..... | ..... | 2.84 | 13.30 | 1.62 | 1.66 | 3.18 | 18.00 |
| 10 | ..... | ..... | 2.71 | 12.00 | 1.55 | 1.10 | 2.82 | 12.80 |
| 11 | ..... | ..... | 2.56 | 10.40 | 1.50 | 0.70 | 2.69 | 11.10 |
| 12 | ..... | ..... | 2.48 | 9.70 | 1.48 | 0.56 | 2.59 | 9.90 |
| 13 | ..... | ..... | 2.38 | 8.90 | 1.48 | 0.56 | 2.50 | 8.80 |
| 14 | ..... | ..... | 2.30 | 8.30 | 1.58 | 1.34 | 2.40 | 7.60 |
| 15 | ..... | ..... | 2.24 | 7.90 | 2.28 | 8.90 | 2.33 | 6.80 |
| 16 | 1.83 | 3.60 | 2.22 | 8.00 | 3.11 | 20.00 | 2.29 | 6.30 |
| 17 | 1.79 | 3.20 | 2.26 | 8.60*b* | 2.94 | 17.60 | 2.32 | 6.60 |
| 18 | 1.69 | 2.20 | 2.14 | 7.20 | 2.53 | 12.10 | 2.28 | 6.20 |
| 19 | 1.64 | 1.82 | 2.11 | 6.80 | 2.38 | 10.10 | 2.26 | 5.90 |
| 20 | 1.65 | 1.90 | 2.09 | 6.60 | 2.28 | 8.90 | 2.31 | 6.50 |
| 21 | 1.99 | 5.40 | 2.05 | 6.10 | 2.20 | 7.90 | 2.27 | 6.00 |
| 22 | 2.19 | 7.80 | 2.03 | 5.90 | 2.14 | 7.20 | 2.19 | 5.10 |
| 23 | 4.61*a* | 25.00 | 2.01 | 5.60 | 2.09 | 6.60 | 2.22 | 5.40 |
| 24 | 3.79 | 12.70 | 2.01 | 5.60 | 2.05 | 6.10 | 2.14 | 4.50 |
| 25 | 2.99 | 3.30 | 1.98 | 5.30 | 2.03 | 5.90 | 2.10 | 4.10 |
| 26 | 3.61 | 10.50 | 1.95 | 5.00 | 2.05 | 6.10 | 2.12 | 4.30 |
| 27 | 2.64 | 1.10 | 1.90 | 4.40 | 2.06 | 6.20 | 2.20 | 5.20 |
| 28 | 2.43 | 0.40 | 1.86 | 4.00 | 2.01 | 5.60 | 2.13 | 4.40 |
| 29 | 2.44 | 1.20 | 1.83 | 3.60 | 2.03 | 5.90 | 2.11 | 4.20 |
| 30 | 2.46 | 2.30 | 1.80 | 3.30 | 2.04 | 6.00 | 2.10 | 4.10 |
| 31 | 2.36 | 2.40 | ..... | ..... | 1.99 | 5.40 | ..... | ..... |

*a* to *b* Shifting ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Sixmile Creek at Spangler's Ranch, for 1915. —*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.08 | 3.90 | 2.06 | 3.70 | 2.34 | 6.90 | 2.47 | 2.90 |
| 2 | 2.05 | 3.60 | 2.05 | 3.60 | 2.35 | 7.00 | 2.50 | 3.40 |
| 3 | 2.02 | 3.20 | 2.05 | 3.60 | 2.58 | 9.80 | 2.55 | 4.40 |
| 4 | 1.98 | 2.80 | 2.00 | 3.00 | 2.55 | 9.40 | 2.62 | 5.80 |
| 5 | 1.90 | 1.90 | 1.99 | 2.90 | 2.50 | 8.80 | 2.60 | 5.40 |
| 6 | 1.85 | 1.40 | 1.95 | 2.40 | 2.46 | 8.30 | 2.61 | 5.60 |
| 7 | 1.80 | 0.90 | 1.93 | 2.20 | 2.43 | 8.00 | 2.62 | 5.80 |
| 8 | 2.20 | 5.20 | 1.90 | 1.90 | 2.50 | 3.40 | 2.61 | 5.60 |
| 9 | 2.15 | 4.60 | 1.85 | 1.40 | 2.50 | 3.40 | 2.60 | 5.40 |
| 10 | 2.10 | 4.10 | 1.80 | 0.90 | 2.51 | 3.60 | 2.61 | 5.60 |
| 11 | 2.05 | 3.60 | 1.75 | 0.60 | 2.53 | 4.00 | 2.62 | 5.80 |
| 12 | 1.93 | 2.20 | 1.70 | 0.30 | 2.54 | 4.20 | 2.68 | 7.20 |
| 13 | 2.05 | 3.60 | 1.62 | 0.06 | 2.55 | 4.40 | 2.65 | 6.50 |
| 14 | 2.40 | 7.60 | 1.65 | 0.15 | 2.58 | 5.00 | 2.61 | 5.60 |
| 15 | 2.45 | 8.20 | 1.68 | 0.24 | 2.56 | 4.60 | 2.60 | 5.40 |
| 16 | 2.43 | 8.00 | 1.70 | 0.30 | 2.53 | 4.00 | 2.58 | 5.00 |
| 17 | 2.55 | 9.40 | 1.70 | 0.30 | 2.51 | 3.60 | 2.59 | 5.20 |
| 18 | 2.92 | 14.20 | 1.68 | 0.24 | 2.50 | 3.40 | 2.58 | 5.00 |
| 19 | 3.00 | 15.30 | 1.80 | 0.90 | 2.50 | 3.40 | 2.55 | 4.40 |
| 20 | 2.67 | 10.80 | 1.95 | 2.40 | 2.55 | 4.40 | 2.55 | 4.40 |
| 21 | 2.48 | 8.60 | 1.90 | 1.90 | 2.52 | 3.80 | 2.54 | 4.20 |
| 22 | 2.38 | 7.40 | 1.88 | 1.70 | 2.51 | 3.60 | 2.52 | 3.80 |
| 23 | 2.20 | 5.20 | 1.87 | 1.60 | 2.50 | 3.40 | 2.51 | 3.60 |
| 24 | 2.20 | 5.20 | 1.85 | 1.40 | 2.50 | 3.40 | 2.50 | 3.40 |
| 25 | 2.21 | 5.30 | 1.83*a* | 1.20 | 2.49 | 3.20 | 2.52 | 3.80 |
| 26 | 2.26 | 5.90 | 1.82*a* | 1.10 | 2.47 | 2.90 | 2.55 | 4.40 |
| 27 | 2.22 | 5.40 | 1.80 | 0.90 | 2.47 | 2.90 | 2.53 | 4.00 |
| 28 | 2.19 | 5.10 | 1.75 | 0.60 | 2.46 | 2.80 | 2.50 | 3.40 |
| 29 | 2.15 | 4.60 | 2.30 | 6.40 | 2.46 | 2.80 | 2.50 | 3.40 |
| 30 | 2.11 | 4.20 | 2.32 | 6.60 | 2.47 | 2.90 | 2.48 | 3.10 |
| 31 | 2.07 | 3.80 | 2.34 | 6.90 | ..... | ..... | 2.47 | 2.90 |

*a* Gauge height interpolated.

MONTHLY DISCHARGE of Sixmile Creek at Spangler's Ranch, for 1915.

(Drainage area 42 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (16–31) | 25.0 | 0.40 | 5.3 | 0.1260 | 0.07 | 169 |
| April | 38.0 | 3.30 | 22.0 | 0.5240 | 0.58 | 1,309 |
| May | 20.0 | 0.56 | 5.6 | 0.1330 | 0.15 | 344 |
| June | 41.0 | 4.10 | 10.8 | 0.2570 | 0.29 | 643 |
| July | 15.3 | 0.90 | 5.6 | 0.1330 | 0.15 | 344 |
| August | 6.9 | 0.06 | 2.0 | 0.0476 | 0.05 | 123 |
| September | 9.8 | 2.80 | 4.7 | 0.1120 | 0.12 | 280 |
| October | 7.2 | 2.90 | 4.7 | 0.1120 | 0.13 | 289 |
| The period | | | | | 1.54 | 3,501 |

LINDNER DITCH FROM BATTLE CREEK.

*Location.*—On the NW. ¼ Sec. 16, Tp. 6, Rge. 29, W. 3rd Mer., near Tennile Police Detachment.

*Records available.*—For the irrigation season of 1910–15.

*Gauge.*—Vertical staff. Zero maintained at 90.36 feet during 1915.

*Bench-mark.*—A permanent iron bench-mark was located near intake headgate. Assumed elevation, 100.00 feet.

*Channel.*—Composed of gravel and clay loam.

*Discharge measurements.*—Made with a 42-inch weir which is permanently installed in the ditch.

*Observer.*—J. B. Lindner.

*Remarks.*—This is a weir station, consisting of a 42-inch sharp crested weir with complete end contractions. The elevation of the crest of the weir was kept at a gauge height of 1.04 feet during 1914–15.

DISCHARGE MEASUREMENTS of Lindner Ditch from Battle Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 8 | H. W. Rowley | *a* | | | 1.71 | 6.30 |
| July 10 | do | | | | Dry. | Nil. |

DAILY GAUGE HEIGHT AND DISCHARGE of Lindner Ditch from Battle Creek, for 1915.

| Day. | April. | | May. | | June. | | July. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | | | | | | | 1.70 | 6.00 |
| 2 | | | | | | | 1.70 | 6.00 |
| 3 | | | | | | | 1.70 | 6.00 |
| 4 | | | | | | | 1.60 | 4.70 |
| 5 | | | | | | | 1.60 | 4.70 |
| 6 | | | | | | | 1.60 | 4.70 |
| 7 | | | | | | | 1.60 | 4.70 |
| 8 | | | | | | | 1.60*b* | 4.70 |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | 1.41*a* | 2.60 | | | | | | |
| 13 | 1.76 | 6.80 | | | | | | |
| 14 | 1.76 | 6.80 | | | | | | |
| 15 | 1.76 | 6.80 | | | | | | |
| 16 | 1.76 | 6.80 | | | | | | |
| 17 | 1.76 | 6.80 | | | | | | |
| 18 | 1.76 | 6.80 | | | | | | |
| 19 | 1.76 | 6.80 | | | | | | |
| 20 | 1.61 | 4.90 | | | | | | |
| 21 | 1.61 | 4.90 | | | | | | |
| 22 | 1.61 | 4.90 | | | | | | |
| 23 | 1.61*b* | 4.90 | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | 1.70*a* | 6.00 | | |
| 30 | | | | | 1.70 | 6.00 | | |
| 31 | | | | | | | | |

*a* Headgate opened.
*b* Headgate closed.

MONTHLY DISCHARGE of Lindner Ditch from Battle Creek, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | |
| April (12–23) | 6.80 | 2.60 | 5.80 | 139 |
| June (29–30) | 6.00 | 6.00 | 6.00 | 24 |
| July (1–8) | 6.00 | 4.70 | 5.20 | 83 |
| The period | | | | 246 |

TENMILE CREEK AT TENMILE POLICE DETACHMENT.

*Location.*—On the SE. ¼ Sec. 4, Tp. 6, Rge. 29, W. 3rd Mer., near the Tenmile Police Detachment.

*Records available.*—July 21, 1909, to October 31, 1914, and for March and April, 1915.

*Gauge.*—Vertical staff. Zero of gauge maintained at 93.38 feet during 1909–11; zero of gauge maintained at 91.72 feet during 1912; zero of gauge maintained at 89.24 feet during 1913; zero of gauge maintained at 90.83 feet from March 15 to September 14, 1914; zero of gauge (temporary station) maintained at 99.76 feet from September 14, to October 31, 1914; zero of gauge maintained at 90.83 feet during 1915.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Practically permanent.

*Discharge measurements.*—Made by wading or with weir.

*Winter flow.*—Station discontinued during winter season.

*Artificial control.*—The beaver dam in Battle Creek which affected the gauge heights at this station during the latter part of 1914 season was destroyed by the police during winter of 1914–15.

*Observer.*—W. H. Tudgay.

DISCHARGE MEASUREMENTS of Tenmile Creek at Tenmile Police Detachment, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 25 | H. R. Carscallen | 8.5 | 12.0 | 1.51 | 2.34 | 18.20 |
| Mar. 30 | do | 4.0 | 3.6 | 1.11 | 1.86 | 3.90 |
| April 3 | do | 19.5 | 23.0 | 1.61 | 2.85 | 37.00 |
| April 10 | do | 4.4 | 2.1 | 0.38 | 1.63 | 0.80 |
| April 13 | H. W. Rowley | .....*a* | ..... | ..... | 1.58 | 0.15 |

*a* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Tenmile Creek at Tenmile Police Detachment, for 1915.

| Day. | March. | | April. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ... | .. | 1.82 | 3.30 |
| 2 | . | | 2.25 | 14.90 |
| 3 | | | 2.80 | 35.00 |
| 4 | | | 3.17 | 50.00 |
| 5 | | | 3.26 | 53.00 |
| 6 | | | 2.27 | 14.20 |
| 7 | | | 1.86 | 4.00 |
| 8 | | | 1.75 | 2.20 |
| 9 | | | 1.67 | 1.17 |
| 10 | | | 1.61 | 0.51 |
| 11 | | | 1.60 | 0.40 |
| 12 | | | 1.61 | 0.51 |
| 13 | | | 1.59 | 0.36 |
| 14 | | | 1.59 | 0.36 |
| 15 | | | 1.58 | 0.32 |
| 16 | | | 1.58 | 0.32 |
| 17 | | | 1.58 | 0.32 |
| 18 | | | 1.58 | 0.32 |
| 19 | | | 1.58 | 0.32 |
| 20 | | | 1.58 | 0.32 |
| 21 | | | 1.58 | 0.32 |
| 22 | 4.32 | 96.00 | 1.58 | 0.32 |
| 23 | 3.70 | 71.00 | 1.58 | 0.32 |
| 24 | 2.55 | 26.00 | 1.58 | 0.32 |
| 25 | 2.36 | 18.90 | 1.58 | 0.32 |
| 26 | 2.15 | 11.40 | 1.58 | 0.32 |
| 27 | 2.08 | 9.20 | 1.58 | 0.32 |
| 28 | 2.02 | 7.60 | 1.58 | 0.32 |
| 29 | 1.97 | 6.20 | 1.58 | 0.32 |
| 30 | 1.88 | 4.70 | 1.58 | 0.32 |
| 31 | 1.75 | 2.20 | | |

MONTHLY DISCHARGE of Tenmile Creek at Tenmile Police Detachment, for 1915.

(Drainage area 24 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (22-31) | 96.0 | 2.20 | 25.0 | 1.042 | 0.39 | 500.0 |
| April | 53.0 | 0.32 | 6.2 | .258 | 0.29 | 369.0 |
| The period | ..... | ..... | ..... | ..... | 0.68 | 869.0 |

BATTLE CREEK AT TENMILE POLICE DETACHMENT.

*Location.*—On the NE. ¼ Sec. 33, Tp. 5, Rge. 29, W. 3rd Mer., at the Highway bridge, about one-quarter mile south of Tenmile Police Detachment and 300 yards north of the new Battle Creek Post Office.

*Records available.*—From June 3, 1909, to October 31, 1915.

*Gauge.*—Chain gauge fastened to the guard rail, on the downstream side of bridge. Zero of gauge maintained at 86.97 feet, length of chain (from marker to bottom of weight) 19.10 feet, during 1909-10; zero of gauge maintained at 86.87 feet, length of chain, 19.10 feet, during 1911; zero of gauge maintained at 86.84 feet, length of chain, 19.11 feet, during 1912-15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Practically permanent, but might shift during extreme floods. Weeds in the channel affect the gauge heights at times, during mid-summer season.

*Discharge measurements.*—Made from downstream side of bridge during high water and by wading or with weir some distance below during low water flow.

*Winter flow.*—Station discontinued during winter season.

*Artificial control.*—There are several large beaver dams above this station which have a tendency to keep the creek running at this point after the creek goes dry farther up towards its source in the Cypress Hills.

*Diversions.*—Lindner Brothers divert water for irrigation, about two miles above.

*Observer.*—W. H. Tudgay, March to June 5; Frank S. Ball, June 6 to August 22, and Tom Bell, August 23 to October 31.

DISCHARGE MEASUREMENTS of Battle Creek at Tenmile Police Detachment, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 15 | H. R. Carscallen | 23.0 | 40.0 | 0.34 | 2.85 | 13.7 |
| Mar. 17 | do | 23.0 | 51.0 | 0.36 | 3.00 | 18.3 |
| Mar. 22 | do | 35.0 | 113.0 | 0.65 | 4.78 | 74.0 |
| Mar. 23 | do | 40.5 | 149.0 | 1.38 | 5.64 | 205.0 |
| Mar. 24 | do | 34.5 | 117.0 | 1.03 | 4.79 | 120.0 |
| Mar. 25 | do | 32.5 | 92.0 | 0.61 | 4.00 | 56.0 |
| Mar. 27 | do | 32.0 | 78.0 | 0.59 | 3.64 | 46.0 |
| Mar. 30 | do | 32.5 | 26.0 | 1.34 | 3.04 | 35.0 |
| April 1 | do | 35.0 | 30.0 | 1.18 | 3.06 | 36.0 |
| April 2 | do | 39.6 | 41.0 | 1.44 | 3.44 | 58.0 |
| April 3 | do | 43.0 | 186.0 | 1.68 | 6.40 | 312.0 |
| April 4 | do | 57.0 | 289.0 | 2.04 | 8.47 | 588.0 |
| April 9 | do | 32.5 | 88.0 | 1.13 | 3.94 | 98.0 |
| April 13 | H. W. Rowley | 34.0 | 32.1 | 1.91 | 3.37 | 61.0 |
| April 22 | do | 30.5 | 23.8 | 1.58 | 3.04 | 38.0 |
| April 27 | do | 28.0 | 21.8 | 1.56 | 2.97 | 33.0 |
| May 8 | do | 25.5 | 18.0 | 1.39 | 2.82 | 25.0 |
| May 25 | do | 31.0 | 29.5 | 1.48 | 3.19 | 44.0 |
| June 3 | do | 47.0 | 85.0 | 1.65 | 4.54 | 140.0 |
| June 4 | do | 40.0 | 158.0 | 1.50 | 5.74 | 237.0 |
| June 21 | do | 35.0 | 33.4 | 1.54 | 3.33 | 51.0 |
| July 10 | do | 31.0 | 27.0 | 1.30 | 3.13 | 35.0 |
| July 30 | do | 33.0 | 29.5 | 1.23 | 3.22 | 36.0 |
| Aug. 16 | do | 28.0 | 18.4 | 0.80 | 2.67 | 14.6 |
| Sept. 7 | do | 31.0 | 24.6 | 1.05 | 3.10 | 26.0 |
| Oct. 4 | do | 36.0 | 33.8 | 1.22 | 3.36 | 41.0 |
| Oct. 27 | do | 31.0 | 25.1 | 1.20 | 3.08 | 30.0 |

DAILY GAUGE HEIGHT AND DISCHARGE of Battle Creek at Tenmile Police Detachment, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 3.08 | 38 | 2.89 | 28.0 | 2.93 | 31 |
| 2 | ..... | ..... | 3.80 | 80 | 2.88 | 28.0 | 3.44 | 58 |
| 3 | ..... | ..... | 7.15 | 407 | 2.87 | 28.0 | 4.36 | 120 |
| 4 | ..... | ..... | 8.46 | 587 | 2.87 | 28.0 | 5.20 | 191 |
| 5 | ..... | ..... | 8.23 | 555 | 2.85 | 26.0 | 6.01 | 270 |
| 6 | ..... | ..... | 5.75 | 344 | 2.82 | 25.0 | 5.93 | 262 |
| 7 | ..... | ..... | 4.68 | 145 | 2.82 | 25.0 | 4.96 | 169 |
| 8 | ..... | ..... | 4.18 | 107 | 2.84 | 26.0 | 4.40 | 123 |
| 9 | ..... | ..... | 3.94 | 90 | 2.72 | 20.0 | 4.05 | 98 |
| 10 | ..... | ..... | 3.68 | 73 | 2.68 | 18.2 | 3.88 | 86 |
| 11 | ..... | ..... | 3.55 | 65 | 2.65 | 17.0 | 3.79 | 79 |
| 12 | ..... | ..... | 3.49 | 61 | 2.60 | 15.0 | 3.69 | 73 |
| 13 | ..... | ..... | 3.37 | 54 | 2.61 | 15.4 | 3.56 | 66 |
| 14 | ..... | ..... | 3.40 | 56 | 2.84 | 26.0 | 3.51 | 63 |
| 15 | ..... | ..... | 3.40 | 56 | 3.30 | 50.0 | 3.42 | 57 |
| 16 | 3.33*a* | 29 | 3.30 | 50 | 4.43 | 125.0 | 3.32 | 51 |
| 17 | 3.00 | 19 | 3.23 | 46 | 4.01 | 95.0 | 3.37 | 54 |
| 18 | 3.00 | 19 | 3.20 | 44 | 3.72 | 75.0 | 3.41 | 57 |
| 19 | 2.80 | 12 | 3.13 | 41 | 3.52 | 63.0 | 3.33 | 52 |
| 20 | 2.87 | 13 | 3.05 | 36 | 3.39 | 55.0 | 3.37 | 54 |
| 21 | 3.17 | 24 | 3.07 | 38 | 3.28 | 49.0 | 3.33 | 52 |
| 22 | 5.98 | 164 | 3.05 | 36 | 3.21 | 45.0 | 3.23 | 45 |
| 23 | 5.58 | 200 | 3.02 | 35 | 3.14 | 41.0 | 3.14 | 40 |
| 24 | 4.65 | 110 | 3.08 | 38 | 3.10 | 39.0 | 3.33 | 51 |
| 25 | 3.96 | 54 | 3.05 | 36 | 3.07 | 38.0 | 3.31 | 49 |
| 26 | 4.00 | 62 | 3.02 | 35 | 3.19 | 43.0 | 3.28 | 47 |
| 27 | 3.76 | 54 | 3.00 | 34 | 3.15 | 41.0 | 3.37 | 52 |
| 28 | 3.55 | 48 | 2.98 | 33 | 3.08 | 38.0 | 3.23 | 44 |
| 29 | 3.46 | 48 | 2.96 | 32 | 3.04 | 36.0 | 3.19 | 42 |
| 30 | 3.22*b* | 45 | 2.95 | 31 | 3.00 | 34.0 | 3.00 | 31 |
| 31 | 3.12 | 40 | ..... | ..... | 2.97 | 33.0 | ..... | ..... |

*a* to *b* Shifting conditions.
*c* to *d* Shifting conditions

DAILY GAUGE HEIGHT AND DISCHARGE of Battle Creek at Tenmile Police Detachment for 1915. —*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.99 | 30 | 3.17 | 34 | 2.85 | 16 | 3.05 | 25 |
| 2 | 3.19 | 41 | 3.14 | 33 | 2.90 | 18 | 3.05 | 25 |
| 3 | 3.09 | 35 | 3.10 | 32 | 3.01 | 24 | 3.26 | 35 |
| 4 | 3.00 | 30 | 3.05 | 29 | 3.10 | 27 | 3.36 | 41 |
| 5 | 2.95 | 27 | 3.05 | 28 | 3.15 | 29 | 3.36 | 41 |
| 6 | 2.94 | 26 | 3.01 | 28 | 3.05 | 24 | 3.38 | 43 |
| 7 | 2.90 | 24 | 2.96 | 26 | 3.10 | 26 | 3.36 | 41 |
| 8 | 3.04 | 31 | 2.95 | 26 | 3.10 | 26 | 3.38 | 43 |
| 9 | 3.18 | 38 | 2.91 | 24 | 3.14 | 28 | 3.37 | 42 |
| 10 | 3.15 | 35 | 2.91 | 24 | 3.14 | 28 | 3.40 | 44 |
| 11 | 3.10 | 33 | 2.86 | 22 | 3.18 | 30 | 3.40 | 44 |
| 12 | 3.00 | 28 | 2.86 | 22 | 3.15 | 29 | 3.38 | 44 |
| 13 | 2.95 | 25 | 2.86 | 22 | 3.28 | 36 | 3.37 | 43 |
| 14 | 4.50 | 120 | 2.85 | 22 | 3.35 | 39 | 3.36 | 43 |
| 15 | 4.16 | 96 | 2.90 | 25 | 3.35 | 40 | 3.36 | 43 |
| 16 | 3.70 | 66 | 2.70 | 16 | 3.36 | 40 | 3.34 | 42 |
| 17 | 3.65 | 63 | 2.86 | 23 | 3.35 | 40 | 3.34 | 42 |
| 18 | 3.79 | 71 | 3.33 | 46 | 3.30 | 37 | 3.36 | 44 |
| 19 | 3.70 | 66 | 3.33 | 46 | 3.30 | 37 | 3.35 | 44 |
| 20 | 3.56 | 57 | 3.33 | 46 | 3.25 | 35 | 3.35 | 43 |
| 21 | 3.46 | 51 | 3.26 | 42 | 3.25 | 34 | 3.36 | 44 |
| 22 | 3.37 | 46 | 3.18 | 37 | 3.23 | 33 | 3.33 | 43 |
| 23 | 3.28 | 40 | 3.00 | 27 | 3.20 | 32 | 3.30 | 41 |
| 24 | 3.42 | 48 | 2.95 | 24 | 3.18 | 31 | 3.28 | 40 |
| 25 | 3.38 | 45 | 2.95 | 24 | 3.18 | 31 | 3.28 | 40 |
| 26 | 3.32 | 42 | 2.91 | 22 | 3.15 | 30 | 3.28 | 40 |
| 27 | 3.27 | 40 | 2.85 | 18 | 3.10 | 28 | 3.19 | 36 |
| 28 | 3.23 | 37 | 2.90 | 20 | 3.00 | 23 | 3.08 | 30 |
| 29 | 3.18 | 34 | 2.85 | 18 | 3.00 | 22 | 3.04 | 28 |
| 30 | 3.22 | 36 | 2.86 | 18 | 3.05 | 25 | 3.02 | 27 |
| 31 | 3.22 | 36 | 2.85 | 17 | ..... | ..... | 3.00*d* | 26 |

*c–d* Shifting conditions.

MONTHLY DISCHARGE of Battle Creek at Tenmile Police Detachment, for 1915.

(Drainage area 210 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (16-31) | 200 | 12 | 59 | 0.281 | 0.17 | 1,866 |
| April | 587 | 31 | 109 | 0.519 | 0.58 | 6,486 |
| May | 125 | 15 | 40 | 0.190 | 0.22 | 2,460 |
| June | 270 | 31 | 82 | 0.391 | 0.44 | 4,891 |
| July | 120 | 24 | 45 | 0.214 | 0.25 | 2,767 |
| August | 46 | 16 | 27 | 0.129 | 0.15 | 1,660 |
| September | 40 | 16 | 30 | 0.143 | 0.16 | 1,785 |
| October | 44 | 25 | 39 | 0.186 | 0.21 | 2,398 |
| The period | ..... | ..... | ..... | ..... | 2.18 | 24,313 |

MARSHALL AND GAFF DITCH FROM BATTLE CREEK.

*Location.*—On the NE. ¼ Sec. 33, Tp. 5, Rge. 29, W. 3rd Mer., about two hundred and fifty feet below headgate of ditch.

*Records available.*—During the irrigation season of 1914 and 1915 no water was used by Mrs. Marshall and no daily gauge height records were kept. Records at a point three miles below are given under Gaff Ditch.

*Gauge.*—Vertical staff driven into the bed of the ditch near the right bank. Elevation of zero maintained at 95.02 feet during 1915.

*Bench-mark.*—Permanent iron bench-mark located near the log control on the left bank. Assumed elevation, 100.00 feet.

*Artificial control.*—A permanent log control was constructed August 9, 1915, fifty feet below the gauge rod.

*Discharge measurements.*—Made with meter or weir.

*Observer.*—Mrs. L. A. Marshall.

GAFF DITCH FROM BATTLE CREEK.

*Location.*—On the SW. ¼ Sec. 25, Tp. 5, Rge. 29, W. 3rd Mer.

*Records available.*—For the irrigation seasons of 1912–15.

*Gauge.*—Vertical staff. The zero of the gauge was maintained at 96.18 feet during 1912 to October 2, 1915. On October 2 a new standard gauge was installed, the zero datum of which is 95.95 feet.

*Bench-mark.*—A permanent iron rod bench-mark was set on June 25, 1915, on the section line between Secs. 25 and 26, about 20 feet north of the ditch. Elevation assumed, 100.00 feet, elevation of old bench-mark stake as referred to iron bench-mark, 99.22 feet.

*Channel.*—Composed of sandy loam.

*Discharge measurements.*—Made with meter by wading or with a weir.

*Artificial control.*—A log control was built 20 feet below the gauge on October 2, 1915.

*Observer.*—W. D. Gaff.

DISCHARGE MEASUREMENTS of Gaff Ditch from Battle Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height | Discharge |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 7 | H. W. Rowley | 7 | 8.6 | 1.06 | 1.54 | 9.1 |
| June 25 | do | ..... | ..... | ..... | Dry. | Nil. |
| Aug. 6 | do | ..... | ..... | ..... | " | " |
| Oct. 2 | do | ..... | ..... | ..... | " | " |
| Oct. 20 | do | 9 | 10.4 | 0.62 | 2.03 | 6.5 |

DAILY GAUGE HEIGHT AND DISCHARGE of Gaff Ditch from Battle Creek, for 1915.

| Day. | May. | | June. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.83 | 13.50 |
| 2 | ..... | ..... | 1.92*b* | 14.80 |
| 3 | ..... | ..... | ..... | ..... |
| 4 | 1.58*a* | 10.0 | ..... | ..... |
| 5 | 1.50 | 9.0 | ..... | ..... |
| 6 | 1.50 | 9.0 | ..... | ..... |
| 7 | 1.58 | 10.0 | ..... | ..... |
| 8 | 1.58 | 10.0 | ..... | ..... |
| 9 | 1.50 | 9.0 | ..... | ..... |
| 10 | 1.42 | 8.0 | ..... | ..... |
| 11 | 1.50 | 9.0 | ..... | ..... |
| 12 | 1.50 | 9.0 | ..... | ..... |
| 13 | 1.42 | 8.0 | ..... | ..... |
| 14 | 2.00*b* | 16.1 | ..... | ..... |
| 15 | ..... | ..... | ..... | ..... |
| 16 | ..... | ..... | ..... | ..... |
| 17 | ..... | ..... | ..... | ..... |
| 18 | ..... | ..... | ..... | ..... |
| 19 | ..... | ..... | ..... | ..... |
| 20 | ..... | ..... | ..... | ..... |
| 21 | ..... | ..... | ..... | ..... |
| 22 | 1.58*a* | 10.0 | ..... | ..... |
| 23 | 1.58 | 10.0 | ..... | ..... |
| 24 | 1.58 | 10.0 | ..... | ..... |
| 25 | 1.58 | 10.0 | ..... | ..... |
| 26 | 1.92 | 14.8 | ..... | ..... |
| 27 | 1.92 | 14.8 | ..... | ..... |
| 28 | 1.92 | 14.8 | ..... | ..... |
| 29 | 1.92 | 14.8 | ..... | ..... |
| 30 | 1.83 | 13.5 | ..... | ..... |
| 31 | 1.83 | 13.5 | ..... | ..... |

*a* Headgate opened.
*b* Headgate closed.

MONTHLY DISCHARGE of Gaff Ditch from Battle Creek, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| May *a* | 16.10 | 8.00 | 11.10 | 462 |
| June *b* | 14.80 | 13.50 | 14.00 | 56 |
| The period | ..... | ..... | ..... | 518 |

*a* Water diverted May 4–14, May 22–31.
*b* Water diverted June 1–2.

F. W. HENRY DITCH FROM BATTLE CREEK.

*Location.*—On the NW. ¼ Sec. 28, Tp. 5, Rge. 28, W. 3rd Mer., near Battle Creek.

*Records available.*—For the irrigation season of 1915.

*Gauge.*—Vertical staff. The zero of the gauge has been maintained at 97.97 feet during 1915.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Composed of Gumbo.

*Discharge measurements.*—Made with a 5-foot sharp crested weir permanently located 20 feet below the gauge elevation of crest 98.52 feet.

*Observer.*—F. W. Henry.

*Remarks.*—This ditch was used for irrigation purposes for five days during April, but as the weir was not installed until October, sufficient data were not obtained to compute the discharge. The estimated discharge is 26 acre-feet.

DISCHARGE MEASUREMENTS of Henry Ditch from Battle Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 7 | H. W. Rowley | 6.2 | 3.7 | 1.02 | 0.61 | 3.8 |
| June 25 | do | | | | Dry. | Nil. |
| Aug. 6 | do | | | | " | " |
| Sept. 4 | do | | | | " | " |
| Sept. 22 | do | | | | " | " |
| Oct. 20 | do | | | | " | " |

DAILY GAUGE HEIGHT AND DISCHARGE of Henry Ditch from Battle Creek, for 1915.

| Day. | May. | |
|---|---|---|
| | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | 0.61 | 3.80 |
| 8 | 0.68 | 4.40 |
| 9 | 0.66 | 4.20 |
| 10 | 0.65 | 4.10 |
| 11 | 0.64 | 4.00 |
| 12 | 0.36 | 1.70 |
| 13 | 0.37 | 1.78 |
| 14 | 0.39 | 1.94 |
| 15 | | |
| 16 | | |
| 17 | | |
| 18 | | |
| 19 | | |
| 20 | | |
| 21 | | |
| 22 | | |
| 23 | | |
| 24 | | |
| 25 | | |
| 26 | | |
| 27 | | |
| 28 | | |
| 29 | | |
| 30 | | |
| 31 | | |

MONTHLY DISCHARGE of Henry Ditch from Battle Creek, for 1915.

| MONTH. | DISCHARGE IN SECOND-FEET. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| May (7–14) | 4.4 | 1.7 | 3.2 | 51 |

HENRY DITCH FROM HALFWAY COULEE.

*Location.*—On NW. ¼ Sec. 34, Tp. 5, Rge. 28, W. 3rd Mer., near Battle Creek.
*Records available.*—For the irrigation season of 1915.
*Gauge.*—Vertical staff.
*Discharge measurements.*—Made with a 24-inch sharp crested rectangular weir, permanently set in the ditch 10 feet below the gauge rod.
*Observer.*—F. W. Henry.
*Remarks.*—The zero flow gauge height was 1.17 feet during 1915. The ditch was used for eight days in May, during which period a total of 15 acre-feet was used.

WILSON DITCH FROM BATTLE CREEK.

*Location.*—On the NE. ¼ Sec. 34, Tp. 5, Rge. 28, W. 3rd Meridian.
*Records available.*—Discharge measurements only in 1914. No water used during 1915.
*Gauge.*—Plain staff. Zero elevation, 96.28 feet since establishment.
*Bench-mark.*—Permanent iron bench-mark on left bank. Assumed elevation, 100.00 feet.

BATTLE CREEK AT WILKES' RANCH.

*Location.*—On the NW. ¼ Sec. 33, Tp. 5, Rge. 27, W. 3rd Mer., at R. W. Wilkes' ranch, twelve miles east of the Tenmile Police Detachment.
*Records available.*—From May 1, 1912, to October 31, 1915. From July 5, 1910, to November 7, 1911, a station was maintained at W. S. Wilson's ranch, six miles above.
*Gauge.*—Vertical staff. Zero of gauge maintained at 89.86 feet during 1912; zero of gauge maintained at 90.01 feet during 1913–15.
*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet, located on the left bank 750 feet below the gauge.
*Channel.*—Composed of sand and slightly shifting.
*Discharge measurements.*—Made by wading.
*Winter flow.*—Station discontinued during winter season.
*Diversions.*—Water is diverted above this station for irrigation purposes, by Mrs. L. A. Marshall, J. A. Gaff, Lindner Brothers, W. S. Wilson and F. W. Henry.
*Observer.*—Mrs. Bertha Wilkes.

DISCHARGE MEASUREMENTS of Battle Creek at Wilkes' Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 6 | H. R. Carscallen | 68.0 | 186.0 | 1.97 | 4.70 | 368.0 |
| April 7 | do | 64.5 | 130.0 | 1.90 | 4.06 | 248.0 |
| April 22 | H. W. Rowley | 37.0 | 33.4 | 1.29 | 2.29 | 43.0 |
| May 7 | do | 37.0 | 19.0 | 0.83 | 1.83 | 15.8 |
| June 5 | do | 36.0 | 118.0 | 2.34 | 3.98 | 277.0 |
| June 25 | do | 37.0 | 40.6 | 1.37 | 2.24 | 55.0 |
| Aug. 5 | do | 25.0 | 17.4 | 1.86 | 2.01 | 32.0 |
| Sept. 4 | do | 25.0 | 16.8 | 1.86 | 1.93 | 31.0 |
| Sept. 23 | do | 37.0 | 35.0 | 0.81 | 1.95 | 28.0 |
| Oct. 20 | do | 24.0 | 15.6 | 1.89 | 1.85 | 30.0 |

DAILY GAUGE HEIGHT AND DISCHARGE of Battle Creek at Wilkes' Ranch, for 1915.

| DAY. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 4.95 | 419 | 2.07 | 28.0 | 1.89 | 18.5 |
| 2 | ..... | ..... | 5.16 | 461 | 2.07 | 28.0 | 2.17 | 34.0 |
| 3 | ..... | ..... | 5.60 | 549 | 2.03 | 26.0 | 2.24 | 39.0 |
| 4 | ..... | ..... | 5.78 | 585 | 1.99 | 23.0 | 3.49 | 169.0 |
| 5 | ..... | ..... | 5.20 | 469 | 1.92 | 20.0 | 3.99 | 278.0 |
| 6 | ..... | ..... | 4.70 | 369 | 1.80 | 14.0 | 4.24 | 318.0 |
| 7 | ..... | ..... | 4.06 | 248 | 1.83 | 15.5 | 4.44 | 350.0 |
| 8 | ..... | ..... | 4.94 | 417 | 1.85 | 16.5 | 4.37 | 339.0 |
| 9 | ..... | ..... | 3.83 | 215 | 1.91 | 19.5 | 4.29 | 326.0 |
| 10 | ..... | ..... | 2.97 | 107 | 1.96 | 22.0 | 4.04 | 286.0 |
| 11 | ..... | ..... | 2.87 | 96 | 1.99 | 24.0 | 3.67 | 231.0 |
| 12 | ..... | ..... | 2.83 | 91 | 2.04 | 26.0 | 3.34 | 185.0 |
| 13 | ..... | ..... | 2.65 | 73 | 2.06 | 28.0 | 2.70 | 104.0 |
| 14 | ..... | ..... | 2.58 | 67 | 2.19 | 35.0 | 2.79 | 115.0 |
| 15 | ..... | ..... | 2.55 | 64 | 2.57 | 66.0 | 2.47 | 78.0 |
| 16 | ..... | ..... | 2.55 | 64 | 3.87 | 221.0 | 2.47 | 78.0 |
| 17 | ..... | ..... | 2.43 | 54 | 2.95 | 105.0 | 2.45 | 76.0 |
| 18 | ..... | ..... | 2.49 | 59 | 2.91 | 100.0 | 2.45 | 76.0 |
| 19 | ..... | ..... | 2.47 | 57 | 2.74 | 82.0 | 2.47 | 78.0 |
| 20 | ..... | ..... | 2.37 | 49 | 2.49 | 59.0 | 2.49 | 80.0 |
| 21 | 4.90*a* | ..... | 2.31 | 44 | 2.39 | 50.0 | 2.42 | 72.0 |
| 22 | 5.42 | ..... | 2.27 | 41 | 2.37 | 49.0 | 2.35 | 65.0 |
| 23 | 6.51 | ..... | 2.28 | 42 | 2.27 | 41.0 | 2.30 | 60.0 |
| 24 | 8.16 | ..... | 2.25 | 40 | 2.15 | 33.0 | 2.32 | 62.0 |
| 25 | 7.95 | ..... | 2.22 | 37 | 2.07 | 28.0 | 2.32 | 62.0 |
| 26 | 7.59 | ..... | 2.20 | 36 | 2.09 | 29.0 | 2.28 | 58.0 |
| 27 | 6.96 | ..... | 2.15 | 33 | 2.09 | 29.0 | 2.27 | 57.0 |
| 28 | 5.46 | ..... | 2.12 | 31 | 2.02 | 25.0 | 2.25 | 55.0 |
| 29 | 5.38 | ..... | 2.07 | 28 | 1.96 | 22.0 | 2.25 | 55.0 |
| 30 | 5.40 | ..... | 2.06 | 28 | 1.93 | 21.0 | 2.23 | 54.0 |
| 31 | 5.20*b* | ..... | ..... | ..... | 1.93 | 21.0 | ..... | ..... |

*a–b* Gauge heights affected by ice-jam; insufficient data to compute discharge.

DAILY GAUGE HEIGHT AND DISCHARGE of Battle Creek at Wilkes' Ranch, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.30 | 60 | 2.16 | 48.0 | 1.72 | 17.2 | 2.04 | 38 |
| 2 | 2.28 | 58 | 2.16 | 48.0 | 1.77 | 20.0 | 2.04 | 38 |
| 3 | 2.30 | 58 | 2.08 | 41.0 | 1.85 | 25.0 | 2.04 | 38 |
| 4 | 2.42 | 72 | 2.05 | 39.0 | 1.92 | 29.0 | 2.05 | 39 |
| 5 | 2.50 | 81 | 2.01 | 36.0 | 1.93 | 30.0 | 2.05 | 39 |
| 6 | 2.48 | 79 | 2.00 | 35.0 | 1.68 | 15.2 | 2.07 | 41 |
| 7 | 2.42 | 72 | 1.96 | 32.0 | 1.68 | 15.2 | 2.07 | 41 |
| 8 | 2.35 | 65 | 1.89 | 27.0 | 1.75 | 19.0 | 2.07 | 41 |
| 9 | 2.26 | 56 | 1.89 | 27.0 | 1.76 | 20.0 | 2.07 | 41 |
| 10 | 2.18 | 49 | 1.89 | 27.0 | 1.80 | 22.0 | 2.07 | 41 |
| 11 | 2.11 | 44 | 1.90 | 28.0 | 1.82 | 23.0 | 2.08 | 41 |
| 12 | 2.74 | 109 | 1.91 | 29.0 | 1.87 | 26.0 | 2.08 | 41 |
| 13 | 2.47 | 78 | 1.97 | 33.0 | 1.87 | 26.0 | 2.08 | 41 |
| 14 | 2.79 | 115 | 1.98 | 34.0 | 1.93 | 30.0 | 2.05 | 39 |
| 15 | 2.97 | 136 | 2.04 | 38.0 | 1.93 | 30.0 | 2.02 | 37 |
| 16 | 2.96 | 135 | 2.08 | 41.0 | 1.95 | 32.0 | 2.02 | 37 |
| 17 | 2.82 | 118 | 2.08 | 41.0 | 1.95 | 32.0 | 2.01 | 36 |
| 18 | 2.87 | 124 | 2.09 | 42.0 | 1.99 | 34.0 | 1.98 | 34 |
| 19 | 2.61 | 93 | 2.19 | 50.0 | 2.01 | 36.0 | 1.93 | 30 |
| 20 | 2.44 | 74 | 2.27 | 57.0 | 2.01 | 36.0 | 1.87 | 26 |
| 21 | 2.42 | 72 | 2.30 | 60.0 | 2.00 | 35.0 | 1.87 | 26 |
| 22 | 2.33 | 63 | 2.25 | 55.0 | 1.98 | 34.0 | 1.87 | 26 |
| 23 | 2.28 | 58 | 2.13 | 45.0 | 1.96 | 32.0 | 1.91 | 29 |
| 24 | 2.23 | 54 | 2.05 | 39.0 | 1.96 | 32.0 | 1.93 | 30 |
| 25 | 2.23 | 54 | 1.94 | 31.0 | 1.96 | 32.0 | 1.95 | 32 |
| 26 | 2.23 | 54 | 1.80 | 22.0 | 1.97 | 33.0 | 1.98 | 34 |
| 27 | 2.23 | 54 | 1.76 | 20.0 | 1.98 | 34.0 | 1.98 | 34 |
| 28 | 2.25 | 55 | 1.72 | 17.2 | 1.98 | 34.0 | 2.05 | 39 |
| 29 | 2.26 | 56 | 1.72 | 17.2 | 1.98 | 34.0 | 2.05 | 39 |
| 30 | 2.28 | 58 | 1.72 | 17.2 | 2.01 | 36.0 | 2.10 | 43 |
| 31 | 2.22 | 53 | 1.72 | 17.2 | ..... | ..... | 2.11 | 44 |

MONTHLY DISCHARGE of Battle Creek at Wilkes' Ranch, for 1915.

(Drainage area 310 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (21-31) | ..... | ..... | 99 | 0.318 | 0.18 | 2,159*a* |
| April | 585 | 28.0 | 162 | 0.523 | 0.58 | 9,640 |
| May | 221 | 14.0 | 42 | 0.136 | 0.16 | 2,582 |
| June | 350 | 18.5 | 129 | 0.416 | 0.46 | 7,676 |
| July | 136 | 44.0 | 74 | 0.240 | 0.28 | 4,550 |
| August | 60 | 17.2 | 35 | 0.113 | 0.13 | 2,152 |
| September | 36 | 15.2 | 28 | 0.090 | 0.10 | 1,666 |
| October | 44 | 26.0 | 37 | 0.119 | 0.14 | 2,275 |
| The period | ..... | ..... | ..... | ..... | 2.03 | 32,700 |

*a* Records for March are estimates made from other stations on this stream.

### GILCHRIST BROTHERS DITCH FROM BATTLE CREEK.

*Location.*—On the SW. ¼ Sec. 11, Tp. 5, Rge. 27, W. 3rd Mer., at the intake of Gilchrist Brothers' ditch near Consul.

*Records available.*—For the irrigation season of 1914. No water used in 1915.

*Gauge.*—Vertical staff. The zero of the gauge has been maintained at 95.81 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark, located in the right bank near the gauge. Assumed elevation, 100.00 feet.

*Discharge measurements.*—Made with a meter in the flume, or with a weir just below the flume.

*Observer.*—W. F. Gilchrist.

### RICHARDSON DITCH FROM BATTLE CREEK.

*Location.*—On the SE. ¼ Sec. 2, Tp. 5, Rge. 27, W. 3rd Mer., near Consul.

*Records available.*—October 14, 1911, to October 31, 1915.

*Gauge.*—Vertical staff. The zero of the gauge has been maintained at 97.03 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark located on the left bank of the ditch at the gauge rod. Assumed elevation, 100.00 feet.

*Channel.*—Composed of clay loam and overgrown with grass.

*Discharge measurements.*—Made by wading or with a weir. During 1915 all discharge measurements were nil flow.

*Observer.*—L. E. Richardson.

*Remarks.*—This ditch was used for sixteen days in April and May but insufficient data were obtained to estimate the discharge.

GAUGE HEIGHT in feet of Richardson Ditch from Battle Creek, for 1915.

| DAY. | April. | | May. | |
|---|---|---|---|---|
| | Gauge Height. | | Gauge Height. | |
| | *Feet.* | | *Feet.* | |
| 1 | | | 0.58 | |
| 2 | | | 0.58 | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | 0.62 | | | |
| 10 | 0.62 | | | |
| 11 | 0.62 | | | |
| 12 | 0.62 | | | |
| 13 | 0.62 | | | |
| 14 | 0.62 | | | |
| 15 | 0.42 | | | |
| 16 | 0.62 | | | |
| 17 | 0.62 | | | |
| 18 | 0.33 | | | |
| 19 | | | | |
| 20 | | | | |
| 21 | | | | |
| 22 | | | | |
| 23 | | | | |
| 24 | | | | |
| 25 | | | | |
| 26 | | | | |
| 27 | 0.58 | | | |
| 28 | 0.58 | | | |
| 29 | 0.58 | | | |
| 30 | 0.58 | | | |
| 31 | | | | |

### J. MCKINNON DITCH FROM BATTLE CREEK.

*Location.*—On the NW. ¼ Sec. 20, Tp. 4, Rge. 26, W. 3rd Mer., near Consul.

*Records available.*—No water has been used since station was established.

*Gauge.*—Vertical staff driven into bed of ditch near the left bank. Elevation of zero maintained at 96.07 feet during 1915.

*Bench-mark.*—During 1915 a permanent iron bench-mark was installed two feet east of the old wooden bench-mark. Assumed elevation, 100.00 feet.

*Discharge measurements.*—Made with meter or weir.

*Artificial control.*—The lateral gate near the station will affect the flow at the gauge.

*Observer.*—James McKinnon.

### STIRLING AND NASH DITCH FROM BATTLE CREEK.

*Location.*—On the SE. ¼ Sec. 22, Tp. 3, Rge. 27, W. 3rd Mer., at R. J. Stirling's ranch, near Consul.

*Records available.*—This station was established July 11, 1911. The ditch was used from July 11 to August 17, 1911, from July 3 to August 20, 1912, and from June 28 to July 19, 1913. But sufficient discharge measurements were not made during 1911–13 to estimate the daily discharge; the only daily discharge records available are for 1914 and 1915.

*Gauge.*—Vertical staff. The zero of the gauge has been maintained at 94.43 feet since establishment.

*Bench-mark.*—A permanent iron bench-mark on the right bank. Assumed elevation, 100.00 feet.

*Channel.*—Uniform and in good condition.

*Discharge measurements.*—Made by wading or with a weir.

*Artificial control.*—On May 21 a control was constructed thirty feet below the gauge consisting of plank piling, driven, end to end, at right angles to ditch, with surface outline about eight inches above contour of ditch.

*Observer.*—R. J. Stirling.

DISCHARGE MEASUREMENTS of Stirling and Nash Ditch from Battle Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 23 | H. W. Rowley | 8.0 | 5.00 | 0.69 | 1.25 | 3.50 |
| May 21 | do | ...a | ... | ... | 1.00 | Nil. |
| June 23 | do | 10.1 | 9.75 | 0.41 | 1.76 | 4.00 |
| Aug. 14 | do | ... | ... | ... | Dry. | Nil. |
| Sept. 4 | do | ... | ... | ... | " | " |
| Sept. 24 | do | ... | ... | ... | " | " |
| Oct. 21 | do | ... | ... | ... | " | " |

*a* Artificial control installed May 21. Zero flow gauge height, 1.00 feet.

DAILY GAUGE HEIGHT AND DISCHARGE of Sterling and Nash Ditch from Battle Creek, for 1915.

| Day. | April. | | May. | | June. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.45 | 6.40 | 1.41 | 1.56 |
| 2 | ..... | ..... | 1.45 | 6.40 | 1.41 | 1.56 |
| 3 | ..... | ..... | 1.47 | 6.80 | 1.40 | 1.50 |
| 4 | ..... | ..... | 1.38 | 5.20 | 1.39 | 1.36 |
| 5 | ..... | ..... | 1.32 | 4.40 | 1.39 | 1.36 |
| 6 | ..... | ..... | 1.30 | 4.10 | 1.39 | 1.36 |
| 7 | ..... | ..... | 1.30 | 4.10 | 1.39 | 1.36 |
| 8 | ..... | ..... | 1.38 | 5.20 | 1.39 | 1.36 |
| 9 | ..... | ..... | 1.48 | 6.90 | 1.39 | 1.36 |
| 10 | ..... | ..... | 1.52 | 7.70 | 1.48 | 1.98 |
| 11 | ..... | ..... | 1.54 | 8.10 | 1.68 | 3.30 |
| 12 | ..... | ..... | 1.55 | 8.30 | 1.83 | 4.60 |
| 13 | ..... | ..... | 1.55 | 8.30 | 1.84 | 4.70 |
| 14 | ..... | ..... | 1.60 | 9.30 | 1.84 | 4.70 |
| 15 | ..... | ..... | 1.32 | 4.40 | 1.79 | 4.20 |
| 16 | ..... | ..... | 1.12 | 2.30 | 1.71 | 3.60 |
| 17 | ..... | ..... | 0.85 | 0.82 | 1.64 | 3.00 |
| 18 | 0.70*a* | 0.40 | 0.60 | 0.25 | 1.61 | 2.80 |
| 19 | 1.30 | 4.10 | 0.30 | 0.00 | 1.78 | 4.10 |
| 20 | 1.45 | 6.40 | 0.30 | 0.00 | 1.80 | 4.30 |
| 21 | 1.45 | 6.40 | 1.20*b* | 0.50 | 1.80 | 4.30 |
| 22 | 1.45 | 6.40 | 1.28 | 0.86 | 1.79 | 4.20 |
| 23 | 1.45 | 6.40 | 1.36 | 1.22 | 1.76 | 4.00 |
| 24 | 1.45 | 6.40 | 1.39 | 1.36 | 1.55 | 2.40 |
| 25 | 1.45 | 6.40 | 1.39 | 1.36 | 1.38 | 1.31 |
| 26 | 1.45 | 6.40 | 1.39 | 1.36 | 1.25 | 0.72 |
| 27 | 1.45 | 6.40 | 1.39 | 1.36 | 1.09 | 0.18 |
| 28 | 1.45 | 6.40 | 1.39 | 1.36 | 1.05 | 0.10 |
| 29 | 1.45 | 6.40 | 1.39 | 1.36 | 1.03 | 0.06 |
| 30 | 1.45 | 6.40 | 1.39 | 1.36 | 1.02 | 0.04 |
| 31 | ..... | ..... | 1.39 | 1.36 | ..... | ..... |

*a* Headgate opened.
*b* New control.

MONTHLY DISCHARGE of Stirling and Nash Ditch from Battle Creek, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | |
| April (18-30) | 6.40 | 0.40 | 5.80 | 149 |
| May | 9.30 | 0.00 | 3.60 | 222 |
| June | 4.70 | 0.04 | 2.40 | 141 |
| The period | ..... | ..... | ..... | 512 |

No water used after June 30th.

BATTLE CREEK AT NASH'S RANCH.

*Location.*—On the NE. ¼ Sec. 3, Tp. 3, Rge. 27, W. 3rd Mer., at F. R. Nash's ranch (Nashlyn Post Office).

*Records available.*—May 11, 1910, to October 31, 1915.

*Gauge.*—Vertical staff. Elevation of zero maintained at 90.23 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Slightly shifting.

*Discharge measurements.*—Made from cable car, by wading or with weir.

*Winter flow.*—Station discontinued during winter season.

*Diversions.*—Water is diverted for irrigation by Jas. McKinnon, Jr., Mrs. S. J. Richardson, Gilchrist Brothers, Stirling and Nash, and L. E. Richardson, between this station and the station at Wilkes' ranch.

*Observer.*—E. R. Nash.

DISCHARGE MEASUREMENTS of Battle Creek at Nash's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 18 | H. W. Rowley | 55 | 19.5 | 0.52 | 2.66*a* | 10.1 |
| Mar. 26 | do | 65 | 166.0 | 1.14 | 5.51*a* | 189.0 |
| Mar. 30 | do | 60 | 156.0 | 0.80 | 4.90*a* | 124.0 |
| April 2 | do | 65 | 268.0 | 2.65 | 5.76 | 714.0 |
| April 3 | do | 74 | 308.0 | 2.59 | 6.30 | 798.0 |
| April 6 | do | 60 | 229.0 | 3.26 | 5.94 | 746.0 |
| April 10 | do | 36 | 65.0 | 2.31 | 2.36 | 152.0 |
| April 23 | do | 37 | 33.0 | 1.40 | 1.12 | 45.0 |
| May 21 | do | 40 | 45.6 | 1.47 | 1.46 | 67.0 |
| June 23 | do | 37 | 37.5 | 1.39 | 1.21 | 52.0 |
| July 18 | do | 35 | 53.2 | 2.06 | 1.76 | 109.0 |
| Aug. 14 | do | 30 | 17.8 | 0.83 | 0.71 | 14.8 |
| Sept. 4 | do | 32 | 23.4 | 0.96 | 0.80 | 23.0 |
| Sept. 24 | do | 32 | 26.4 | 1.04 | 0.88 | 27.0 |
| Oct. 21 | do | 33 | 27.0 | 0.96 | 0.85 | 26.0 |

*a* Gauge height affected by ice.

DAILY GAUGE HEIGHT AND DISCHARGE of Battle Creek at Nash's Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 5.60*b* | 535 | 0.94 | 31.0 | 0.85 | 25 |
| 2 | ..... | ..... | 7.15 | 976 | 0.93 | 30.0 | 0.94 | 31 |
| 3 | ..... | ..... | 6.19 | 793 | 0.90 | 28.0 | 0.95 | 32 |
| 4 | ..... | ..... | 5.44 | 652 | 0.87 | 26.0 | 1.62 | 90 |
| 5 | ..... | ..... | 6.06 | 768 | 0.90 | 28.0 | 1.95 | 123 |
| 6 | ..... | ..... | 5.91 | 740 | 0.87 | 26.0 | 3.08 | 261 |
| 7 | ..... | ..... | 4.57 | 501 | 0.67 | 14.5 | 3.15 | 272 |
| 8 | ..... | ..... | 3.24 | 285 | 0.64 | 13.0 | 2.84 | 228 |
| 9 | ..... | ..... | 2.68 | 207 | 0.54 | 8.6 | 2.42 | 174 |
| 10 | ..... | ..... | 2.32 | 162 | 0.55 | 9.0 | 2.05 | 133 |
| 11 | ..... | ..... | 2.03 | 131 | 0.45 | 5.5 | 1.75 | 103 |
| 12 | ..... | ..... | 1.85 | 113 | 0.44 | 5.2 | 1.63 | 91 |
| 13 | ..... | ..... | 1.72 | 100 | 0.44 | 5.2 | 1.55 | 83 |
| 14 | ..... | ..... | 1.63 | 91 | 0.50 | 7.0 | 1.65 | 93 |
| 15 | ..... | ..... | 1.55 | 83 | 0.80 | 22.0 | 1.43 | 72 |
| 16 | ..... | ..... | 1.45 | 73 | 1.05 | 39.0 | 1.35 | 64 |
| 17 | ..... | ..... | 1.45 | 73 | 1.05 | 39.0 | 1.33 | 63 |
| 18 | 2.66*a* | 10.1 | 1.44 | 73 | 1.78 | 106.0 | 1.30 | 60 |
| 19 | 2.71 | 40.0 | 1.34 | 64 | 1.70 | 98.0 | 1.25 | 55 |
| 20 | 2.66 | 70.0 | 1.32 | 62 | 1.55 | 83.0 | 1.30 | 60 |
| 21 | 2.66 | 100.0 | 1.25 | 55 | 1.50 | 78.0 | 1.34 | 64 |
| 22 | 2.73 | 140.0 | 1.15 | 47 | 1.40 | 69.0 | 1.25 | 55 |
| 23 | 2.73 | 170.0 | 1.13 | 45 | 1.30 | 60.0 | 1.23 | 54 |
| 24 | 2.83 | 200.0 | 1.12 | 45 | 1.15 | 47.0 | 1.15 | 47 |
| 25 | 2.86 | 230.0 | 1.04 | 38 | 1.03 | 37.0 | 1.15 | 47 |
| 26 | 6.01 | 254.0 | 1.03 | 37 | 0.95 | 32.0 | 1.05 | 39 |
| 27 | 6.72 | 361.0 | 1.05 | 39 | 0.95 | 32.0 | 1.15 | 47 |
| 28 | 5.60 | 204.0 | 1.03 | 37 | 0.94 | 31.0 | 1.06 | 40 |
| 29 | 5.51 | 194.0 | 1.01 | 36 | 0.95 | 32.0 | 1.15 | 47 |
| 30 | 5.26 | 164.0 | 0.96 | 32 | 0.95 | 32.0 | 1.13 | 45 |
| 31 | 5.30 | 336.0 | ..... | ..... | 0.93 | 30.0 | ..... | ..... |

*a* to *b* Ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Battle Creek at Nash's Ranch, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.06 | 40 | 1.15 | 47.0 | 0.68 | 15.0 | 0.85 | 25 |
| 2 | 1.04 | 38 | 1.04 | 38.0 | 0.72 | 17.2 | 0.84 | 24 |
| 3 | 0.97 | 33 | 1.03 | 37.0 | 0.82 | 23.0 | 0.84 | 24 |
| 4 | 0.96 | 32 | 1.00 | 35.0 | 0.81 | 23.0 | 0.85 | 25 |
| 5 | 1.00 | 35 | 0.96 | 32.0 | 0.83 | 24.0 | 0.85 | 25 |
| 6 | 0.95 | 32 | 0.95 | 32.0 | 0.85 | 25.0 | 0.88 | 27 |
| 7 | 0.95 | 32 | 0.90 | 28.0 | 0.85 | 25.0 | 0.90 | 28 |
| 8 | 0.97 | 33 | 0.87 | 26.0 | 0.85 | 25.0 | 0.94 | 31 |
| 9 | 1.00 | 35 | 0.85 | 25.0 | 0.85 | 25.0 | 0.94 | 31 |
| 10 | 1.15 | 47 | 0.83 | 24.0 | 0.83 | 24.0 | 1.00 | 35 |
| 11 | 1.06 | 40 | 0.77 | 20.0 | 0.90 | 28.0 | 0.95 | 32 |
| 12 | 1.05 | 39 | 0.75 | 19.0 | 0.83 | 24.0 | 0.95 | 32 |
| 13 | 1.05 | 39 | 0.75 | 19.0 | 0.85 | 25.0 | 0.95 | 32 |
| 14 | 0.95 | 32 | 0.71 | 16.6 | 0.85 | 25.0 | 0.95 | 32 |
| 15 | 0.96 | 32 | 0.73 | 17.8 | 0.85 | 25.0 | 0.96 | 32 |
| 16 | 1.74 | 102 | 0.73 | 17.8 | 0.90 | 28.0 | 0.98 | 34 |
| 17 | 1.74 | 102 | 0.73 | 17.8 | 0.93 | 30.0 | 0.95 | 32 |
| 18 | 1.65 | 93 | 0.73 | 17.8 | 0.92 | 29.0 | 0.96 | 32 |
| 19 | 1.65 | 93 | 0.71 | 16.6 | 0.93 | 30.0 | 0.94 | 31 |
| 20 | 1.64 | 92 | 0.71 | 16.6 | 0.89 | 27.0 | 0.92 | 29 |
| 21 | 1.52 | 80 | 1.05 | 39.0 | 0.86 | 26.0 | 0.85 | 25 |
| 22 | 1.40 | 69 | 0.95 | 32.0 | 0.85 | 25.0 | 0.84 | 24 |
| 23 | 1.34 | 64 | 0.90 | 28.0 | 0.84 | 24.0 | 0.83 | 24 |
| 24 | 1.25 | 55 | 0.88 | 27.0 | 0.89 | 27.0 | 0.86 | 26 |
| 25 | 1.15 | 47 | 0.85 | 25.0 | 0.85 | 25.0 | 0.86 | 26 |
| 26 | 1.08 | 41 | 0.70 | 16.0 | 0.84 | 24.0 | 0.85 | 25 |
| 27 | 1.12 | 45 | 0.77 | 20.0 | 0.83 | 24.0 | 0.85 | 25 |
| 28 | 1.15 | 47 | 0.75 | 19.0 | 0.83 | 24.0 | 0.84 | 24 |
| 29 | 1.20 | 51 | 0.75 | 19.0 | 0.84 | 24.0 | 0.89 | 27 |
| 30 | 1.13 | 45 | 0.73 | 17.8 | 0.83 | 24.0 | 0.83 | 24 |
| 31 | 1.23 | 54 | 0.71 | 16.6 | ..... | .... | 0.82 | 23 |

MONTHLY DISCHARGE of Battle Creek at Nash's Ranch, for 1915.

(Drainage area 500 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (18-31) | 361.0 | 10.1 | 177.0 | 0.354 | 0.18 | 4,904 |
| April | 976.0 | 32.0 | 230.0 | 0.460 | 0.51 | 13,686 |
| May | 106.0 | 5.2 | 36.0 | 0.072 | 0.08 | 2,214 |
| June | 272.0 | 25.0 | 87.0 | 0.174 | 0.19 | 5,177 |
| July | 102.0 | 32.0 | 52.0 | 0.104 | 0.12 | 3,197 |
| August | 47.0 | 16.0 | 25.0 | 0.050 | 0.06 | 1,537 |
| September | 30.0 | 15.0 | 25.0 | 0.050 | 0.06 | 1,488 |
| October | 35.0 | 23.0 | 28.0 | 0.056 | 0.06 | 1,722 |
| The period | | | | | 1.26 | 33,925 |

## FRENCHMAN RIVER DRAINAGE BASIN.

*General Description.*

Frenchman River drains the greater portion of southwestern Saskatchewan. It rises in Cypress Lake in Township 6, Range 26, West of the 3rd Meridian and follows a southeasterly course for some 150 miles, crossing into the United States in Range 10, West of 3rd Meridian. It eventually finds its way into Milk River near Saco, Montana, and therefore forms a part of the general drainage basin of the Missouri.

Cypress Lake is on the southern slope of Cypress Hills at an elevation of about 3155 feet above sea level. It occupies what is probably a portion of an abandoned water course or channel of an ancient river, which joined Battle Creek to the Frenchman River. The water of the lake is fresh and is supplied by a number of coulees and small streams which head in the hills to the north. The largest of these are Oxarart and Sucker creeks, both of which have a small continuous flow.

During dry years Cypress Lake does not overflow and the whole discharge of the Frenchman River is derived from Belanger, Davis and Fairwell Creeks and the north branch. From Township 6, Range 23, West of the 3rd Meridian, where the north branch joins the main stream, there is no appreciable supply to the river while in Canada. Mule Creek which joins the river in Township 5, Range 17, West of 3rd Meridian, and Snake Creek in Township 3, Range 13, West of 3rd Meridian, however, have a small flow.

The country surrounding Cypress Lake is of rolling prairie much broken by coulees. In many of these there is considerable tree growth but for the most part the country is devoid of all vegetation other than grasses. All the streams in the upper section of the drainage basin, with the exception of the north branch, rise on the plateau at the top of the hills. Flowing southward they break through deep well wooded gorges before reaching the lower flats along the river. The north branch, however, is in a deep valley throughout its entire length. Its feeders, like the western tributaries of the main stream, cut from the bench to the valley in deep well wooded coulees. Below the mouth of the north branch there is little tree growth. Here and there along the river may be found small growths of shrubs and maple, while up on the hillsides in some of the coulees there are small clumps of poplar covering an acre or so. Most of these coulees are rapidly becoming cleared by the settlers who are taking up the bench lands above the river valley. The benches are well covered with grasses but the hills and sides of the valley are almost devoid of all vegetation. In the flats along the river, except where irrigated, the chief vegetation consists of sage brush and cactus.

When the Frenchman River leaves the lake, it flows through a wide flat valley as far as the mouth of Fairwell Creek. Most of this land is under proposed or constructed irrigation ditches. Below this point the valley becomes more broken and narrows considerably while the side hills become higher. Small portions of this bottom will no doubt be brought under irrigation, but as yet little has been done in that direction.

Below the junction of the north branch, the valley becomes rough and rugged, the sides being cut with buttes and deep coulees. Here numerous outcroppings of lignite may be seen and also a deep seam of light coloured clay and sand. This seam, which has been bleached almost a pure white, shows at many points along the river's entire course and is one of the most conspicuous objects in this region. From its colour and nature the river receives its local name of the "Whitemud."

At East End, some miles lower down, the valley again widens out into flats. Here is located the largest irrigation project in the Cypress Hills district. J. C. Strong has a large dam in the river and a system of ditches and storage reservoirs, which irrigate a large part of the flat. Directly above this project there are two smaller irrigation schemes and just below Messrs. Morrison Brothers have a dam and ditch which will irrigate a large area. Their ditch is carried across the river and continued by Messrs. Duncan and Watson who irrigate another large area.

Below the East End flat none of the flats which occur at various points along the river are irrigated as yet. A short distance below the mouth of Snake Creek the river enters Bad Lands which continue into the United States.

On most of the tributary streams above Eastend and on some below that point there are irrigation schemes covering areas of various sizes.

The mean annual rainfall of this basin is not well established, but it is estimated that it would range from twelve to sixteen inches, most of which falls in May, June and July. From November to April, the streams are frozen over and usually there is an abundant rainfall.

During 1914, a number of stations were established on the lower tributaries of this stream and also two on the main stream. These stations were established to obtain the run-off of this lower region and the total discharge of the stream in Canada.

The construction of the Weyburn-Lethbridge branch of the Canadian Pacific Railway through the upper part of the valley has opened up that part of basin and this development has resulted in one or two settlements coming into existence, the most important of which is East End.

OXARART CREEK AT WYLIE'S RANCH.

*Location.*—On the NE. ¼ Sec. 20, Tp. 6, Rge. 27, W. 3rd Mer., at Joseph Wylie's ranch.

*Records available.*—From June 15, 1909 to October 31, 1915.

*Gauge.*—Vertical staff. Zero of gauge maintained at 3199.02 feet during 1909–10; zero of gauge maintained at 3199.06 feet during 1911; zero of gauge maintained at 3199.03 feet during 1912–15.

*Bench-mark.*—Permanent iron bench-mark, located on the right bank at the station. Elevation 3203.75 feet above mean sea level. (Irrigation Surveys.)

*Discharge measurements.*—Made by wading or with a weir.

*Winter flow.*—Station discontinued during winter season.

*Artificial control.*—On August 5, 1915, a permanent 36-inch sharp crested weir was installed twenty feet below the gauge which acts as a control for the gauge.

*Observer.*—Miss B. K. Wylie.

DISCHARGE MEASUREMENTS of Oxarart Creek at Wylie's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 20 | H. R. Carscallen | 3.3 | 0.96 | 0.52 | 0.81 | 0.50 |
| Mar. 29 | do | 4 9 | 2.40 | 0.45 | 0.92 | 1.10 |
| April 6 | do | 22.2 | 24 00 | 3.42 | 1.42 | 84.00 |
| April 7 | do | 22.5 | 24 00 | 3.00 | 1.36 | 71.00 |
| April 22 | H. W. Rowley | ....a | .... | .... | 0.90 | 1.40 |
| May 7 | do | ....a | .... | .... | 0.95 | 2.10 |
| June 25 | do | ....a | .... | .... | 0.92 | 1.61 |
| Aug. 4 | do | ....a | .... | .... | 0.90 | 1.46 |
| Aug. 5 | do | ....a | .... | .... | 1.24b | 1.45 |
| Sept. 4 | do | ....a | .... | .... | 1.20 | 1.15 |
| Sept. 22 | do | ....a | .... | .... | 1.17 | 0.95 |

*a* Weir measurement.
*b* New control.

DAILY GAUGE HEIGHT AND DISCHARGE of Oxarart Creek at Wylie's Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.30 | 58.00 | 0.90 | 1.10 | 0.95 | 2.00 |
| 2 | ..... | ..... | 1.98 | 207.00 | 0.90 | 1.10 | 0.97 | 3.10 |
| 3 | ..... | ..... | 2.22 | 260.00 | 1.00 | 4.80 | 0.99 | 4.20 |
| 4 | ..... | ..... | 1.45 | 91.00 | 1.05 | 9.70 | 1.03 | 7.70 |
| 5 | ..... | ..... | 1.62 | 128.00 | 1.00 | 4.80 | 1.01 | 5.80 |
| 6 | ..... | ..... | 1.32 | 62.00 | 0.95 | 2.00 | 0.98 | 3.70 |
| 7 | ..... | ..... | 1.30 | 58.00 | 0.95 | 2.00 | 0.97 | 3.10 |
| 8 | ..... | ..... | 1.15 | 26.00 | 0.95 | 2.00 | 0.95 | 2.00 |
| 9 | ..... | ..... | 1.10 | 17.00 | 0.95 | 2.00 | 0.95 | 2.00 |
| 10 | ..... | ..... | 1.10 | 17.00 | 0.94 | 1.82 | 0.95 | 2.00 |
| 11 | ..... | ..... | 1.15 | 26.00 | 0.95 | 2.00 | 0.95 | 2.00 |
| 12 | ..... | ..... | 1.10 | 17.00 | 0.96 | 2.60 | 0.95 | 2.00 |
| 13 | ..... | ..... | 1.12 | 21.00 | 1.05 | 9.70 | 0.95 | 2.00 |
| 14 | ..... | ..... | 1.00 | 4.80 | 1.06 | 10.20 | 0.94 | 1.82 |
| 15 | ..... | ..... | 1.05 | 9.70 | 1.10 | 17.00 | 0.95 | 2.00 |
| 16 | ..... | ..... | 0.95 | 2.00 | 1.05 | 9.70 | 0.95 | 2.00 |
| 17 | ..... | ..... | 0.90 | 1.10 | 1.04 | 8.90 | 0.95 | 2.00 |
| 18 | ..... | ..... | 0.90 | 1.10 | 1.00 | 4.80 | 0.94 | 1.82 |
| 19 | ..... | ..... | 0.90*a* | 1.10 | 0.98 | 3.70 | 0.94 | 1.82 |
| 20 | ..... | ..... | 0.90 | 1.10 | 0.97 | 3.10 | 0.94 | 1.82 |
| 21 | ..... | ..... | 0.90 | 1.10 | 0.95 | 2.00 | 0.95 | 2.00 |
| 22 | ..... | ..... | 0.89 | 1.02 | 0.94 | 1.82 | 0.94 | 1.82 |
| 23 | ..... | ..... | 0.90 | 1.10 | 0.94 | 1.82 | 0.94 | 1.82 |
| 24 | ..... | ..... | 0.95 | 2.00 | 0.93 | 1.60 | 0.95 | 2.00 |
| 25 | ..... | ..... | 0.95 | 2.00 | 0.92 | 1.50 | 0.95 | 2.00 |
| 26 | ..... | ..... | 0.90 | 1.10 | 0.92 | 1.50 | 0.95 | 2.00 |
| 27 | ..... | ..... | 0.89 | 1.02 | 0.94 | 1.82 | 0.95 | 2.00 |
| 28 | ..... | ..... | 0.90 | 1.10 | 0.95 | 2.00 | 0.95 | 2.00 |
| 29 | 1.25 | 47 | 0.90 | 1.10 | 0.95 | 2.00 | 0.95 | 2.00 |
| 30 | 1.30 | 58 | 0.91 | 1.28 | 0.95 | 2.00 | 0.95 | 2.00 |
| 31 | 1.50 | 102 | ..... | ..... | 0.95 | 2.00 | ..... | ..... |

*a* Gauge height interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of Oxarart Creek at Wylie's Ranch, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 0.95 | 2.00 | 0.91 | 1.28 | 1.20 | 1.15 | 1.15 | 0.82 |
| 2 | 0.95 | 2.00 | 0.91 | 1.28 | 1.20 | 1.15 | 1.15 | 0.82 |
| 3 | 0.94 | 1.82 | 0.91 | 1.28 | 1.20 | 1.15 | 1.15 | 0.82 |
| 4 | 0.94 | 1.82 | 0.91 | 1.28 | 1.20 | 1.15 | 1.15 | 0.82 |
| 5 | 0.94 | 1.82 | 1.24*a* | 1.45 | 1.20 | 1.15 | 1.15 | 0.82 |
| 6 | 0.94 | 1.82 | 1.24 | 1.45 | 1.20 | 1.15 | 1.18 | 1.01 |
| 7 | 0.94 | 1.82 | 1.24 | 1.45 | 1.20 | 1.15 | 1.18 | 1.01 |
| 8 | 1.01 | 5.80 | 1.24 | 1.45 | 1.20 | 1.15 | 1.20 | 1.15 |
| 9 | 1.02 | 6.80 | 1.24 | 1.45 | 1.20 | 1.15 | 1.20 | 1.15 |
| 10 | 1.00 | 4.80 | 1.24 | 1.45 | 1.20 | 1.15 | 1.22 | 1.30 |
| 11 | 0.95 | 2.00 | 1.24 | 1.45 | 1.20 | 1.15 | 1.22 | 1.30 |
| 12 | 0.94 | 1.82 | 1.24 | 1.45 | 1.20 | 1.15 | 1.22 | 1.30 |
| 13 | 0.95 | 2.00 | 1.24 | 1.45 | 1.20 | 1.15 | 1.22 | 1.30 |
| 14 | 0.95 | 2.00 | 1.24 | 1.45 | 1.18 | 1.01 | 1.20 | 1.15 |
| 15 | 0.95 | 2.00 | 1.24 | 1.45 | 1.18 | 1.01 | 1.20 | 1.15 |
| 16 | 0.95 | 2.00 | 1.24 | 1.45 | 1.18 | 1.01 | 1.18 | 1.01 |
| 17 | 0.95 | 2.00 | 1.24 | 1.45 | 1.18 | 1.01 | 1.17 | 0.95 |
| 18 | 0.99 | 4.20 | 1.24 | 1.45 | 1.18 | 1.01 | 1.17 | 0.95 |
| 19 | 0.99 | 4.20 | 1.25 | 1.53 | 1.18 | 1.01 | 1.17 | 0.95 |
| 20 | 0.90 | 1.10 | 1.25 | 1.53 | 1.18 | 1.01 | 1.15 | 0.82 |
| 21 | 0.91 | 1.28 | 1.25 | 1.53 | 1.18 | 1.01 | 1.15 | 0.82 |
| 22 | 0.91 | 1.28 | 1.25 | 1.53 | 1.18 | 1.01 | 1.14 | 0.76 |
| 23 | 0.91 | 1.28 | 1.25 | 1.53 | 1.18 | 1.01 | 1.14 | 0.76 |
| 24 | 0.91 | 1.28 | 1.25 | 1.53 | 1.18 | 1.01 | 1.14 | 0.76 |
| 25 | 0.91 | 1.28 | 1.25 | 1.53 | 1.18 | 1.01 | 1.14 | 0.76 |
| 26 | 0.91 | 1.28 | 1.20 | 1.15 | 1.18 | 1.01 | 1.14 | 0.76 |
| 27 | 0.91 | 1.28 | 1.20 | 1.15 | 1.18 | 1.01 | 1.10 | 0.52 |
| 28 | 0.91 | 1.28 | 1.20 | 1.15 | 1.18 | 1.01 | 1.10 | 0.52 |
| 29 | 0.91 | 1.28 | 1.20 | 1.15 | 1.18 | 1.01 | 1.10 | 0.52 |
| 30 | 0.90 | 1.10 | 1.20 | 1.15 | 1.18 | 1.01 | 1.10 | 0.52 |
| 31 | 0.91 | 1.28 | 1.20 | 1.15 | ..... | ..... | 1.10*b* | 0.52 |

*a* to *b* 36″ weir installed as control. Zero flow gauge height, 96.

MONTHLY DISCHARGE of Oxarart Creek at Wylie's Ranch, for 1915.

(Drainage area 77 square miles.)

| Month | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (29-31) | 102.00 | 47.00 | 69.00 | 0.8960 | 0.10 | 410 |
| April | 260.00 | 1.02 | 34.00 | 0.4420 | 0.49 | 2,023 |
| May | 17.00 | 1.10 | 4.00 | 0.0500 | 0.06 | 246 |
| June | 7.70 | 1.82 | 2.50 | 0.0325 | 0.04 | 149 |
| July | 6.80 | 1.10 | 2.20 | 0.0286 | 0.03 | 135 |
| August | 1.53 | 1.15 | 1.39 | 0.0180 | 0.02 | 85 |
| September | 1.15 | 1.01 | 1.07 | 0.0140 | 0.02 | 64 |
| October | 1.30 | 0.52 | 0.90 | 0.0117 | 0.01 | 55 |
| The period | ..... | ..... | ..... | ..... | 0.77 | 3,167 |

SUCKER CREEK AT GILCHRIST'S RANCH.

*Location.*—On the NW. ¼ Sec. 24, Tp. 6, Rge. 26, W. 3rd Mer.

*Records available.*—May 25, 1909, to October 31, 1915.

*Gauge.*—Vertical staff. Elevation of the zero of the gauge has been maintained at 3191.11 feet since April, 1912. Elevation of the old gauge two hundred feet below was 3189.20 feet

*Bench-mark.*—Permanent iron bench-mark. Elevation 3196.25 feet above mean sea level. (Irrigation Surveys.)

*Channel.*—Slightly shifting.

*Discharge measurements.*—Made by meter and by weir in low stages.

*Winter flow.*—This station has not been maintained during winter.

*Observer.*—J. D. Gilchrist.

DISCHARGE MEASUREMENTS of Sucker Creek at Gilchrist's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 30 | M. H. French | 13.0 | 4.90 | 1.31 | 0.84 | 6.40 |
| April 12 | do | 9.0 | 5.40 | 2.04 | 1.26 | 11.00 |
| May 16 | J. E. Caughey | 7.5 | 7.10 | 1.97 | 1.41 | 14.00 |
| June 17 | do | 6.0 | 2.80 | 1.14 | 1.01 | 3.20 |
| July 16 | do | 6.5 | 2.57 | 1.14 | 1.02 | 3.60 |
| Aug. 6 | do | 7.0 | 2.70 | 0.84 | 0.95 | 2.30 |
| Aug. 27 | do | 7.0 | 2.55 | 0.76 | 0.94 | 1.94 |
| Sept. 28 | do | 6.5 | 3.20 | 0.97 | 1.00 | 3.10 |
| Oct. 18 | do | 6.6 | 2.75 | 0.89 | 0.98 | 2.50 |
| Oct. 29 | do | 7.0 | 2.80 | 0.88 | 0.98 | 2.50 |

DAILY GAUGE HEIGHT AND DISCHARGE of Sucker Creek at Gilchrist's Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 0.83 | 6.6 | *b* | 8.3 | 1.50 | 10.5 |
| 2 | ..... | ..... | 1.92 | 22.0 | ..... | 8.3 | 1.50 | 10.5 |
| 3 | ..... | ..... | 4.75 | 102.0 | ..... | 8.4 | 1.50 | 10.5 |
| 4 | ..... | ..... | 3.40 | 62.0 | ..... | 8.5 | 1.50 | 10.5 |
| 5 | ..... | ..... | 2.60 | 38.0 | ..... | 8.6 | 1.50 | 10.5 |
| 6 | ..... | ..... | 1.75 | 18.9 | ..... | 8.7 | 1.45 | 9.8 |
| 7 | ..... | ..... | 1.58 | 16.0 | ..... | 8.7 | 1.40 | 9.0 |
| 8 | ..... | ..... | 1.35 | 12.5 | ..... | 8.8 | 1.35 | 8.2 |
| 9 | ..... | ..... | 1.35 | 12.5 | ..... | 8.8 | 1.05 | 3.8 |
| 10 | ..... | ..... | 1.32 | 12.1 | ..... | 8.9 | 1.05 | 3.8 |
| 11 | ..... | ..... | 1.22 | 10.8 | ..... | 8.9 | 1.05 | 3.8 |
| 12 | ..... | ..... | 1.24 | 11.0 | ..... | 9.0 | 1.05 | 3.8 |
| 13 | ..... | ..... | 1.31 | 11.9 | ..... | 9.1 | 1.04 | 3.6 |
| 14 | ..... | ..... | 1.30 | 11.8 | ..... | 9.2 | 1.00 | 3.0 |
| 15 | ..... | ..... | 1.30 | 11.8 | .....*c* | 9.2 | 1.00 | 3.0 |
| 16 | ..... | ..... | 1.30 | 11.8 | 1.41 | 9.2 | 1.05 | 3.8 |
| 17 | ..... | ..... | 1.30 | 11.8 | 1.20*a* | 6.0 | 1.01 | 3.2 |
| 18 | ..... | ..... | 1.29 | 11.7 | 1.03 | 3.4 | 0.90 | 1.6 |
| 19 | ..... | ..... | 1.13 | 9.7 | 1.05 | 3.8 | 1.00 | 3.0 |
| 20 | ..... | ..... | 1.10 | 9.3 | 1.04 | 3.6 | 1.11 | 4.6 |
| 21 | ..... | ..... | 1.09*a* | 9.2 | 1.04 | 3.6 | 1.04 | 3.6 |
| 22 | ..... | ..... | 1.08 | 9.1 | 1.03 | 3.4 | 1.01 | 3.2 |
| 23 | 0.85 | 6.6 | 1.03 | 8.5 | 1.03 | 3.4 | 1.00 | 3.0 |
| 24 | 0.70 | 5.1 | 1.03 | 8.5 | 1.03 | 3.4 | 0.90 | 1.6 |
| 25 | 0.80 | 6.1 | 1.02 | 8.3 | 0.99 | 2.9 | 1.15 | 5.2 |
| 26 | 0.85 | 6.6 | 1.02 | 8.3 | 1.00 | 3.0 | 1.10 | 4.5 |
| 27 | 0.73 | 5.4 | 1.02 | 8.3 | 1.00 | 3.0 | 1.05 | 3.8 |
| 28 | 0.83 | 6.4 | 1.02*a* | 8.3 | 0.92 | 1.9 | 1.00 | 3.0 |
| 29 | 0.84 | 6.5 | 1.02*a* | 8.3 | 0.92 | 1.9 | 1.00 | 3.0 |
| 30 | 0.70 | 5.1 | 1.02*a* | 8.3 | 1.00 | 3.0 | 1.00 | 3.0 |
| 31 | 0.76 | 5.7 | ..... | ..... | 1.00 | 3.0 | ..... | ..... |

*a* Gauge height interpolated.
*b* to *c* No gauge height records; discharge estimated.

DAILY GAUGE HEIGHT AND DISCHARGE of Sucker Creek at Gilchrist's Ranch, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.00 | 3.0 | 1.01 | 3.2 | 1.00 | 3.0 | 0.93 | 2.0 |
| 2 | 1.00 | 3.0 | 1.00 | 3.0 | 1.95 | 17.2 | 0.95 | 2.3 |
| 3 | 1.00 | 3.0 | 1.00 | 3.0 | 1.00 | 3.0 | 1.00 | 3.0 |
| 4 | 0.95 | 2.3 | 1.00 | 3.0 | 1.90 | 16.5 | 1.00 | 3.0 |
| 5 | 0.90 | 1.6 | 0.98 | 2.7 | 1.75 | 14.2 | 0.97 | 2.6 |
| 6 | 0.90 | 1.6 | 0.96 | 2.4 | 1.00 | 3.0 | 0.98 | 2.7 |
| 7 | 0.90 | 1.6 | 0.96 | 2.4 | 1.25 | 6.7 | 1.00 | 3.0 |
| 8 | 1.05 | 3.8 | 0.96 | 2.4 | 1.10 | 4.5 | 1.95 | 17.2 |
| 9 | 1.18 | 5.7 | 0.95 | 2.3 | 1.27 | 7.1 | 1.87 | 16.0 |
| 10 | 1.16 | 5.4 | 0.95 | 2.3 | 1.00 | 3.0 | 1.80 | 15.0 |
| 11 | 1.00 | 3.0 | 0.93 | 2.0 | 1.10 | 4.5 | 1.00 | 3.0 |
| 12 | 0.95 | 2.3 | 0.93 | 2.0 | 1.10 | 4.5 | 1.00 | 3.0 |
| 13 | 0.95 | 2.3 | 0.92 | 2.0 | 1.15 | 5.2 | 1.00 | 3.0 |
| 14 | 1.05 | 3.8 | 0.92 | 2.0 | 1.00 | 3.0 | 1.00 | 3.0 |
| 15 | 1.05 | 3.8 | 0.92 | 2.0 | 1.00 | 3.0 | 1.05 | 3.8 |
| 16 | 1.02 | 3.3 | 1.00 | 3.0 | 0.95 | 2.3 | 1.00 | 3.0 |
| 17 | 1.04 | 3.6 | 0.98 | 2.7 | 0.95 | 2.3 | 1.07 | 4.0 |
| 18 | 1.30 | 7.5 | 0.98 | 2.7 | 0.94 | 2.2 | 0.98 | 2.7 |
| 19 | 1.30 | 7.5 | 1.10 | 4.5 | 0.97 | 2.6 | 0.99 | 2.9 |
| 20 | 1.30 | 7.5 | 1.08 | 4.2 | 0.95 | 2.3 | 0.97 | 2.6 |
| 21 | 1.12 | 4.8 | 1.08 | 4.2 | 0.94 | 2.2 | 0.97 | 2.6 |
| 22 | 1.04 | 3.6 | 1.00 | 3.0 | 0.90 | 1.6 | 0.95 | 2.3 |
| 23 | 1.00 | 3.0 | 1.05 | 3.8 | 0.90 | 1.6 | 0.96 | 2.4 |
| 24 | 1.08 | 4.2 | 0.98 | 2.7 | 0.75 | 0.4 | 1.00 | 3.0 |
| 25 | 1.05 | 3.8 | 0.98 | 2.7 | 0.75 | 0.4 | 1.05 | 3.8 |
| 26 | 1.04 | 3.6 | 0.94 | 2.2 | 0.80 | 0.8 | 1.07 | 4.0 |
| 27 | 1.04 | 3.6 | 0.94 | 2.2 | 0.80 | 0.8 | 1.03 | 3.4 |
| 28 | 1.05 | 3.8 | 0.94 | 2.2 | 1.00 | 3.0 | 1.02 | 3.3 |
| 29 | 1.06 | 3.9 | 1.00 | 3.0 | 0.90 | 1.6 | 1.04 | 3.6 |
| 30 | 1.03 | 3.4 | 1.00 | 3.0 | 0.91 | 1.7 | 1.00 | 3.0 |
| 31 | 1.02 | 3.3 | 1.00 | 3.0 | ..... | ..... | 1.04 | 3.6 |

MONTHLY DISCHARGE of Sucker Creek at Gilchrist's Ranch, for 1915.

(Drainage area 30 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (23-31) | 6.6 | 5.1 | 6.0 | 0.200 | 0.07 | 107 |
| April | 102.0 | 6.6 | 16.7 | 0.557 | 0.62 | 994 |
| May | 9.2 | 1.9 | 6.1 | 0.203 | 0.23 | 375 |
| June | 10.5 | 1.6 | 5.1 | 0.170 | 0.19 | 304 |
| July | 7.5 | 1.6 | 3.8 | 0.127 | 0.15 | 234 |
| August | 4.5 | 2.0 | 2.8 | 0.093 | 0.11 | 172 |
| September | 17.2 | 4.0 | 4.1 | 0.137 | 0.15 | 244 |
| October | 17.2 | 2.0 | 4.3 | 0.143 | 0.16 | 264 |
| The period | ..... | ..... | ..... | .. | 1.68 | 2,694 |

BELANGER CREEK AT OAKES' RANCH.

*Location.*—On the NE. ¼ Sec. 19, Tp. 6, Rge. 25, W. 3rd Mer., previous to August 7, 1915, was a mile upstream on the SW. ¼ Sec. 30, Tp. 6, Rge. 25, W. 3rd Mer.

*Records available.*—April 1, 1912, to April 11, 1914; June 17, 1915, to October 31, 1915.

*Gauge.*—Vertical staff. The zero elevation of the gauge was maintained at 3164.10 feet from date of establishment until August 7, 1915; from August 7 until October 31, 1915, it was maintained at 3447.71 feet at the new station.

*Bench-mark.*—Permanent iron bench-mark. Elevation, 3168.37 feet above mean sea level. (Irrigation Surveys.)

*Channel.*—Slightly shifting, affected by weeds.
*Discharge measurements.*—Made with meter.
*Winter flow.*—This station is not maintained during the winter.
*Diversions.*—Messrs. R. G. Williamson, T. A. Drury, J. H. G. Bettington, Dixon and Stewart divert water for irrigation purposes above the gauge.
*Observer.*—Joseph Drury.

DISCHARGE MEASUREMENTS of Belanger Creek at Oakes' Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 16 | J. E. Caughey | 17.0 | 10.10 | 2.38 | 0.58 | 24.0 |
| June 17 | do | 16.0 | 7.05 | 1.30 | 0.40 | 9.2 |
| July 16 | do | 11.0 | 19.65 | 0.68 | 0.44 | 13.5 |
| Aug. 7 | do | 9.6*a* | 19.76 | 0.37 | 3.75 | 7.2 |
| Aug. 27 | do | 10.0 | 16.40 | 0.30 | 3.39 | 5.0 |
| Sept. 28 | do | 10.5 | 19.27 | 0.33 | 3.56 | 6.5 |
| Oct. 18 | do | 10.2 | 14.98 | 0.49 | 3.37 | 7.4 |
| Oct. 29 | do | 9.5*b* | 13.17 | 0.50 | 3.25 | 6.6 |

*a* to *b* New station, one mile downstream.

DAILY GAUGE HEIGHT AND DISCHARGE of Belanger Creek at Oakes' Ranch, for 1915.

| Day. | June. | | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 0.53 | 17.8 | 0.27 | 6.2 | 3.50 | 5.8 | 3.55 | 6.2 |
| 2 | ..... | ..... | 0.58 | 22.0 | 0.27 | 6.2 | 3.75 | 7.6 | 3.56 | 6.3 |
| 3 | ..... | ..... | 0.63 | 26.0 | 0.28 | 6.4 | 3.75 | 7.6 | 3.60 | 6.7 |
| 4 | ..... | ..... | 0.63 | 26.0 | 0.28 | 6.4 | 3.70 | 7.2 | 3.60 | 6.9 |
| 5 | ..... | ..... | 0.63 | 26.0 | 0.27 | 6.2 | 3.70 | 7.2 | 3.60 | 7.0 |
| 6 | ..... | ..... | 0.73 | 35.0 | 0.27 | 6.2 | 3.70 | 7.2 | 3.60 | 7.2 |
| 7 | ..... | ..... | 0.73 | 35.0 | 3.75*c* | 7.6 | 3.75 | 7.6 | 3.57 | 7.3 |
| 8 | ..... | ..... | 0.74 | 36.0 | 3.75 | 7.6 | 3.80 | 8.0 | 3.55 | 7.3 |
| 9 | ..... | ..... | 0.83 | 44.0 | 3.74 | 7.5 | 3.75 | 7.6 | 3.50 | 7.0 |
| 10 | ..... | ..... | 0.82 | 43.0 | 3.74 | 7.5 | 3.75 | 7.6 | 3.45 | 6.8 |
| 11 | ..... | ..... | 0.78 | 39.0 | 3.76 | 7.7 | 3.75 | 7.6 | 3.45 | 7.0 |
| 12 | ..... | ..... | 0.78 | 39.0 | 3.80 | 8.0 | 3.75 | 7.6 | 3.44 | 7.0 |
| 13 | ..... | ..... | 0.75 | 36.0 | 3.80 | 8.0 | 3.80 | 8.0 | 3.44 | 7.2 |
| 14 | ..... | ..... | 0.73 | 35.0 | 3.80 | 8.0 | 3.80 | 8.0 | 3.42 | 7.2 |
| 15 | ..... | ..... | 0.63*a* | 26.0 | 3.77 | 7.8 | 3.75 | 7.6 | 3.40 | 7.1 |
| 16 | ..... | ..... | 0.44 | 12.5 | 3.77 | 7.8 | 3.75 | 7.6 | 3.40 | 7.3 |
| 17 | 0.43 | 12.0 | 0.43 | 12.0 | 3.75 | 7.6 | 3.65 | 6.8 | 3.38*a* | 7.3 |
| 18 | 0.54 | 18.5 | 0.41 | 11.0 | 3.75 | 7.6 | 3.65 | 6.8 | 3.37 | 7.4 |
| 19 | 0.58 | 22.0 | 0.41 | 11.0 | 3.88 | 8.6 | 3.65 | 6.8 | 3.36*d* | 7.3 |
| 20 | 0.58 | 22.0 | 0.39 | 10.1 | 3.85 | 8.4 | 3.65 | 6.8 | 3.35 | 7.3 |
| 21 | 0.57 | 21.0 | 0.38 | 9.8 | 3.95 | 9.2 | 3.60 | 6.4 | 3.33 | 7.1 |
| 22 | 0.53 | 17.8 | 0.36 | 9.1 | 3.70 | 7.2 | 3.60 | 6.4 | 3.31 | 7.0 |
| 23 | 0.51 | 16.2 | 0.35 | 8.7 | 3.65 | 6.8 | 3.65 | 6.8 | 3.30 | 6.9 |
| 24 | 0.48 | 14.5 | 0.36 | 9.1 | 3.60 | 6.4 | 3.65 | 6.8 | 3.29 | 6.8 |
| 25 | 0.44 | 12.5 | 0.36 | 9.1 | 3.50 | 5.8 | 3.65 | 6.8 | 3.28 | 6.7 |
| 26 | 0.40 | 10.5 | 0.39 | 10.1 | 3.50 | 5.8 | 3.60 | 6.4 | 3.27 | 6.7 |
| 27 | 0.48 | 14.5 | 0.38 | 9.8 | 3.40 | 5.2 | 3.59 | 6.3 | 3.27 | 6.7 |
| 28 | 0.53 | 17.8 | 0.36 | 9.1 | 3.40*a* | 5.2 | 3.56 | 6.2 | 3.26*e* | 6.6 |
| 29 | 0.53 | 17.8 | 0.36 | 9.1 | 3.40*a* | 5.2 | 3.56 | 6.2 | 3.25 | 6.6 |
| 30 | 0.53 | 17.8 | 0.34 | 8.3 | 3.40 | 5.2 | 3.56 | 6.3 | 3.25*a* | 6.6 |
| 31 | ..... | ..... | 0.30 | 6.9 | 3.40 | 5.2 | ..... | ..... | 3.25*a* | 6.6 |

*a*, *d–e* Gauge heights interpolated.
*c* New station established.

MONTHLY DISCHARGES of Belanger Creek at Oakes' Ranch, for 1915.

(Drainage area 65 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| June (17-30) | 22.0 | 10.5 | 16.8 | 0.258 | 0.13 | 452 |
| July | 44.0 | 6.9 | 21.0 | 0.323 | 0.37 | 1,291 |
| August | 9.2 | 5.2 | 6.9 | 0.106 | 0.12 | 424 |
| September | 8.0 | 5.8 | 7.1 | 0.109 | 0.12 | 422 |
| October | 7.4 | 6.2 | 6.9 | 0.106 | 0.12 | 424 |
| The period | ..... | ..... | ..... | ..... | 0.86 | 4,013 |

DAVIS CREEK AT DRURY'S RANCH.

*Location.*—On the NE. ¼ Sec. 29, Tp. 6, Rge. 25, W. 3rd Mer.

*Records available.*—May 24 to November 3, 1909; April 23, 1911, to October 31, 1915.

*Gauge.*—Vertical staff. Zero elevation has been maintained at 3176.79 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark. Elevation 3183.06 feet above mean sea level. (Irrigation Surveys.)

*Channel.*—Permanent.

*Discharge measurements.*—Made with meter and with weir at low stages.

*Winter flow.*—This station is not maintained during the winter.

*Diversions.*—Mr. B. C. Wright diverts water for irrigation purposes above the gauge.

*Observer.*—Joseph Drury.

DISCHARGE MEASUREMENTS of Davis Creek at Drury's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq.-ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft* |
| Mar. 30 | M. H. French | 14.0 | 6.10 | 1.39 | 0.61 | 8.50 |
| April 12 | do | 19.0 | 14.80 | 2.15 | 0.78 | 32.00 |
| May 14 | J. E. Caughey | 21.0 | 24.70 | 1.07 | 0.73 | 26.00 |
| June 17 | do | 10.4 | 3.18 | 1.30 | 0.35 | 4.10 |
| July 15 | do | 16.0 | 11.15 | 1.51 | 0.56 | 16.80 |
| Aug. 6 | do | 8.5 | 1.98 | 1.19 | 0.30 | 2.40 |
| Aug. 27 | do | 5.0 | 1.55 | 1.45 | 0.25 | 2.20 |
| Sept. 28 | do | *a* | | | 0.19 | 0.61 |
| Oct. 18 | do | 5.3 | 1.90 | 1.56 | 0.32 | 3.00 |
| Oct. 29 | do | 5.1 | 1.50 | 1.33 | 0.28 | 1.99 |

*a* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Davis Creek at Drury's Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 0.72 | 27.0 | 0.32 | 3.10 | 0.45 | 8.8 |
| 2 | ..... | ..... | 2.61 | 184.0 | 0.31 | 2.80 | 0.95 | 46.0 |
| 3 | ..... | ..... | 5.03 | 384.0 | 0.30 | 2.40 | 1.10 | 59.0 |
| 4 | ..... | ..... | 4.20 | 316.0 | 0.29 | 2.20 | 1.18 | 65.0 |
| 5 | ..... | ..... | 2.95 | 212.0 | 0.28 | 2.10 | 0.99 | 49.0 |
| 6 | ..... | ..... | 1.67 | 106.0 | 0.27 | 1.89 | 0.80 | 34.0 |
| 7 | ..... | ..... | 1.27 | 73.0 | 0.27 | 1.89 | 0.65 | 22.0 |
| 8 | ..... | ..... | 1.09 | 58.0 | 0.26 | 1.72 | 0.55 | 14.6 |
| 9 | ..... | ..... | 1.00 | 50.0 | 0.26 | 1.72 | 0.50 | 11.4 |
| 10 | ..... | ..... | 0.80 | 34.0 | 0.26 | 1.72 | 0.47 | 9.8 |
| 11 | ..... | ..... | 0.74 | 29.0 | 0.26 | 1.72 | 0.45 | 8.8 |
| 12 | ..... | ..... | 0.81 | 35.0 | 0.26 | 1.72 | 0.45 | 8.8 |
| 13 | ..... | ..... | 0.79 | 33.0 | 0.26 | 1.72 | 0.43 | 7.7 |
| 14 | ..... | ..... | 0.75 | 30.0 | 0.27 | 1.89 | 0.40 | 6.1 |
| 15 | ..... | ..... | 0.70 | 25.0 | 0.50 | 11.40 | 0.39 | 5.7 |
| 16 | ..... | ..... | 0.58 | 16.6 | 0.73 | 28.00 | 0.37 | 5.0 |
| 17 | ..... | ..... | 0.56 | 15.3 | 0.70 | 25.00 | 0.35 | 4.2 |
| 18 | ..... | ..... | 0.53 | 13.4 | 0.67 | 23.00 | 0.37 | 5.0 |
| 19 | ..... | ..... | 0.53 | 13.4 | 0.60 | 17.90 | 0.42 | 7.2 |
| 20 | ..... | ..... | 0.51*a* | 12.0 | 0.55 | 14.60 | 0.71 | 26.0 |
| 21 | ..... | ..... | 0.49 | 10.9 | 0.50 | 11.40 | 0.67 | 23.0 |
| 22 | ..... | ..... | 0.48 | 10.3 | 0.40 | 6.10 | 0.60 | 17.9 |
| 23 | 0.30 | 2.40 | 0.47 | 9.8 | 0.30 | 2.40 | 0.50 | 11.4 |
| 24 | 0.26 | 1.72 | 0.46*a* | 9.3 | 0.27 | 1.89 | 0.40 | 6.1 |
| 25 | 0.26 | 1.72 | 0.44*a* | 8.2 | 0.25 | 1.55 | 0.31 | 2.8 |
| 26 | 0.25 | 1.55 | 0.43 | 7.7 | 0.26 | 1.72 | 0.40 | 6.1 |
| 27 | 0.43 | 7.70 | 0.39 | 5.7 | 0.25 | 1.55 | 0.42 | 7.2 |
| 28 | 0.51 | 12.00 | 0.35 | 4.2 | 0.45 | 8.80 | 0.45 | 8.8 |
| 29 | 0.59 | 17.20 | 0.33 | 3.5 | 0.46 | 9.30 | 0.45 | 8.8 |
| 30 | 0.61 | 18.60 | 0.33 | 3.5 | 0.45 | 8.80 | 0.44 | 8.2 |
| 31 | 0.61 | 18.60 | ..... | ..... | 0.45 | 8.80 | ..... | ..... |

*a* Gauge height interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of Davis Creek at Drury's Ranch, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 0.45 | 8.8 | 0.38 | 5.40 | 0.24 | 1.38 | 0.19 | 0.65 |
| 2 | 0.45 | 8.8 | 0.35 | 4.20 | 0.24 | 1.38 | 0.19 | 0.65 |
| 3 | 0.45 | 8.8 | 0.32 | 3.10 | 0.24 | 1.38 | 0.19 | 0.65 |
| 4 | 0.44 | 8.2 | 0.30 | 2.40 | 0.24 | 1.38 | 0.21 | 0.87 |
| 5 | 0.44 | 8.2 | 0.30 | 2.40 | 0.24 | 1.38 | 0.23 | 1.21 |
| 6 | 0.43 | 7.7 | 0.30 | 2.40 | 0.24 | 1.38 | 0.25 | 1.55 |
| 7 | 0.40 | 6.1 | 0.30 | 2.40 | 0.24 | 1.38 | 0.29 | 2.20 |
| 8 | 0.70 | 25.0 | 0.30 | 2.40 | 0.24 | 1.38 | 0.31 | 2.80 |
| 9 | 1.01 | 51.0 | 0.30 | 2.40 | 0.24 | 1.38 | 0.34 | 3.90 |
| 10 | 0.96 | 47.0 | 0.30 | 2.40 | 0.24 | 1.38 | 0.37 | 5.00 |
| 11 | 0.85 | 38.0 | 0.30 | 2.40 | 0.24 | 1.38 | 0.39 | 5.70 |
| 12 | 0.75 | 30.0 | 0.30 | 2.40 | 0.24 | 1.38 | 0.38 | 5.40 |
| 13 | 0.65 | 22.0 | 0.29 | 2.20 | 0.24 | 1.38 | 0.37 | 5.00 |
| 14 | 0.60 | 17.9 | 0.29 | 2.20 | 0.24 | 1.38 | 0.36 | 4.60 |
| 15 | 0.56 | 15.3 | 0.29 | 2.20 | 0.24 | 1.38 | 0.34 | 3.90 |
| 16 | 0.55 | 14.6 | 0.30 | 2.40 | 0.24 | 1.38 | 0.33 | 3.50 |
| 17 | 0.53 | 13.4 | 0.30 | 2.40 | 0.24 | 1.38 | 0.32 | 3.10 |
| 18 | 0.52 | 12.7 | 0.30 | 2.40 | 0.24 | 1.38 | 0.32 | 3.10 |
| 19 | 0.50 | 11.4 | 0.30 | 2.40 | 0.24 | 1.38 | 0.32 | 3.10 |
| 20 | 0.49 | 10.9 | 0.29 | 2.20 | 0.24 | 1.38 | 0.31 | 2.80 |
| 21 | 0.41 | 6.6 | 0.35 | 4.20 | 0.24 | 1.38 | 0.31 | 2.80 |
| 22 | 0.40 | 6.1 | 0.35 | 4.20 | 0.24 | 1.38 | 0.31 | 2.80 |
| 23 | 0.43 | 7.7 | 0.33 | 3.50 | 0.23 | 1.21 | 0.30 | 2.40 |
| 24 | 0.41 | 6.6 | 0.30 | 2.40 | 0.22 | 1.04 | 0.30 | 2.40 |
| 25 | 0.40 | 6.1 | 0.28 | 2.10 | 0.21 | 0.87 | 0.29 | 2.20 |
| 26 | 0.40 | 6.1 | 0.25 | 1.55 | 0.21 | 0.87 | 0.29 | 2.20 |
| 27 | 0.40 | 6.1 | 0.25 | 1.55 | 0.20 | 0.70 | 0.29 | 2.20 |
| 28 | 0.40 | 6.1 | 0.25*a* | 1.55 | 0.19 | 0.65 | 0.28 | 2.10 |
| 29 | 0.55 | 14.6 | 0.24*a* | 1.38 | 0.19 | 0.65 | 0.28 | 2.10 |
| 30 | 0.45 | 8.8 | 0.24 | 1.38 | 0.19 | 0.65 | 0.28 | 2.10 |
| 31 | 0.42 | 7.2 | 0.24 | 1.38 | ..... | ..... | 0.28 | 2.10 |

MONTHLY DISCHARGE of Davis Creek at Drury's Ranch, for 1915.

(Drainage area 45 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean. | Per Square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (23-31) | 18.60 | 1.55 | 9.00 | 0.200 | 0.07 | 161 |
| April | 38.40 | 3.50 | 58.00 | 1.290 | 1.44 | 3,451 |
| May | 2.80 | 1.55 | 6.90 | 0.151 | 0.17 | 418 |
| June | 6.50 | 2.80 | 16.80 | 0.373 | 0.42 | 1,000 |
| July | 5.10 | 6.10 | 14.50 | 0.322 | 0.37 | 892 |
| August | 5.40 | 1.38 | 2.50 | 0.056 | 0.06 | 154 |
| September | 1.38 | 0.65 | 1.23 | 0.027 | 0.03 | 74 |
| October | 5.70 | 0.65 | 2.70 | 0.060 | 0.07 | 166 |
| The period | | | | | 2.63 | 6,315 |

FAIRWELL CREEK AT DRURY'S RANCH.

*Location.*—On the NW. ¼ Sec. 30, Tp. 6, Rge. 21, W. 3rd Mer.

*Records available.*—June 10, 1909, to October 31, 1915.

*Gauge.*—Vertical staff. Zero elevation has been maintained at 3122.77 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark. Elevation, 3127.64 feet above sea level. (Irrigation Surveys' datum.)

*Channel.*—Slightly shifting owing to beaver dams.

*Discharge measurements.*—Made with meter; weir at low periods.

*Diversions.*—Messrs. Armstrong and Sons, Kearney Bros. and J. Ingram divert water for irrigation purposes above the gauge.

*Observer.*—C. A. Drury.

DISCHARGE MEASUREMENTS of Fairwell Creek at Drury's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 30 | M. H. French | 11.0 | 3.10 | 0.44 | 2.49 | 1.37 |
| April 10 | do | 81.0 | 57.95 | 1.21 | 3.07 | 70.00 |
| April 13 | do | 78.0 | 42.40 | 1.18 | 2.91 | 50.00 |
| April 21 | do | 13.4 | 8.17 | 2.18 | 2.56 | 17.80 |
| May 16 | J. E. Caughey | 18.0 | 9.75 | 2.90 | 2.60 | 28.00 |
| June 17 | do | 13.0 | 9.90 | 1.24 | 2.49 | 12.20 |
| July 15 | do | 14.0 | 9.00 | 1.40 | 2.43 | 12.60 |
| Aug. 5 | do | 12.0 | 7.80 | 1.39 | 2.43 | 10.60 |
| Aug. 27 | do | 12.0 | 5.30 | 0.97 | 2.26 | 5.10 |
| Sept. 27 | do | 12.0 | 5.35 | 0.62 | 2.18 | 3.30 |
| Oct. 15 | do | 11.0 | 4.05 | 0.69 | 2.18 | 2.80 |
| Oct. 29 | do | 12.5 | 6.17 | 0.74 | 2.26 | 4.60 |

DAILY GAUGE HEIGHT AND DISCHARGE of Fairwell Creek at Drury's Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.73 | 10.0 | 2.41 | 10.0 | 2.70 | 27.0 |
| 2 | ..... | ..... | 3.87 | 126.0 | 2.40 | 9.5 | 3.10 | 74.0 |
| 3 | ..... | ..... | 5.03 | 294.0 | 2.39 | 9.1 | 3.23 | 91.0 |
| 4 | ..... | ..... | 4.65 | 250.0 | 2.38 | 8.8 | 3.18 | 84.0 |
| 5 | ..... | ..... | 4.31 | 208.0 | 2.37 | 8.5 | 3.01 | 62.0 |
| 6 | ..... | ..... | 3.87 | 156.0 | 2.38 | 8.8 | 2.81 | 38.0 |
| 7 | ..... | ..... | 3.69 | 138.0 | 2.38 | 8.8 | 2.72 | 29.0 |
| 8 | ..... | ..... | 3.34 | 97.0 | 2.38 | 8.8 | 2.65 | 23.0 |
| 9 | ..... | ..... | 3.29 | 96.0*c* | 2.37 | 8.5 | 2.54 | 16.2 |
| 10 | ..... | ..... | 3.08*d* | 71.0 | 2.37 | 8.5 | 2.49 | 13.6 |
| 11 | ..... | ..... | 2.97 | 57.0 | 2.37 | 8.5 | 2.50 | 14.0 |
| 12 | ..... | ..... | 2.94 | 53.0 | 2.35 | 7.8 | 2.49 | 13.6 |
| 13 | ..... | ..... | 2.91 | 49.0 | 2.35 | 7.8 | 2.48 | 13.1 |
| 14 | ..... | ..... | 2.94 | 53.0 | 2.35 | 7.8 | 2.49 | 13.6 |
| 15 | ..... | ..... | 2.85 | 42.0 | 2.34 | 7.4 | 2.48 | 13.1 |
| 16 | ..... | ..... | 2.79 | 36.0 | 2.63 | 22.0 | 2.50 | 14.0 |
| 17 | ..... | ..... | 2.75 | 32.0 | 2.67 | 25.0 | 2.50 | 14.0 |
| 18 | ..... | ..... | 2.71 | 28.0 | 2.60 | 19.6 | 2.49 | 13.6 |
| 19 | ..... | ..... | 2.63 | 22.0 | 2.54 | 16.2 | 2.65 | 23.0 |
| 20 | ..... | ..... | 2.59 | 19.0 | 2.48 | 13.1 | 3.00 | 61.0 |
| 21 | ..... | ..... | 2.55 | 16.8 | 2.43 | 10.8 | 2.98 | 58.0 |
| 22 | ..... | ..... | 2.51 | 14.6 | 2.40 | 9.5 | 2.88 | 46.0 |
| 23 | ..... | ..... | 2.50 | 14.0 | 2.38 | 8.8 | 2.74 | 31.0 |
| 24 | 2.49 | 1.37*a* | 2.48 | 13.1 | 2.37 | 8.5 | 2.62 | 21.0 |
| 25 | 2.48 | 1.35 | 2.47 | 12.6 | 2.47 | 12.6 | 2.60 | 19.6 |
| 26 | 2.46 | 1.34 | 2.48 | 13.1 | 2.83 | 40.0 | 2.54 | 16.2 |
| 27 | 2.47 | 1.34 | 2.43 | 10.8 | 2.81 | 38.0 | 2.65 | 23.0 |
| 28 | 2.48 | 1.35 | 2.43 | 10.8 | 2.63 | 22.0 | 2.65 | 23.0 |
| 29 | 2.49 | 1.37*b* | 2.43 | 10.8 | 2.73 | 30.0 | 2.60 | 19.6 |
| 30 | 2.49 | 1.37 | 2.43 | 10.8 | 2.69 | 26.0 | 2.55 | 16.8 |
| 31 | 2.53 | 2.70 | ..... | ..... | 2.69 | 26.0 | ..... | ..... |

*a* to *b* Discharge interpolated.
*b* to *c* Shifting conditions.
*d* Gauge height interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of Fairwell Creek at Drury's Ranch, for 1915. —*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.50 | 14.0 | 2.56 | 17.4 | 2.26 | 4.9 | 2.20 | 3.3 |
| 2 | 2.49 | 13.6 | 2.55 | 16.8 | 2.26 | 4.9 | 2.20 | 3.3 |
| 3 | 2.48 | 13.1 | 2.52 | 15.1 | 2.26 | 4.9 | 2.22 | 3.8 |
| 4 | 2.45 | 11.8 | 2.48 | 13.1 | 2.26 | 4.9 | 2.26 | 4.9 |
| 5 | 2.45 | 11.8 | 2.43 | 10.9 | 2.26 | 4.9 | 2.26 | 4.9 |
| 6 | 2.45 | 11.8 | 2.43 | 10.9 | 2.25 | 4.6 | 2.24 | 4.4 |
| 7 | 2.45 | 11.8 | 2.43 | 10.9 | 2.25 | 4.6 | 2.24 | 4.4 |
| 8 | 2.47 | 12.6 | 2.43 | 10.9 | 2.25 | 4.6 | 2.20 | 3.3 |
| 9 | 2.52 | 15.1 | 2.41 | 10.0 | 2.25 | 4.6 | 2.19 | 3.1 |
| 10 | 2.50 | 14.0 | 2.39 | 9.1 | 2.26 | 4.9 | 2.19 | 3.1 |
| 11 | 2.45 | 11.8 | 2.38 | 8.8 | 2.26 | 4.9 | 2.19 | 3.1 |
| 12 | 2.45 | 11.8 | 2.38 | 8.8 | 2.26 | 4.9 | 2.19 | 3.1 |
| 13 | 2.45 | 11.8 | 2.38 | 8.8 | 2.26 | 4.9 | 2.19 | 3.1 |
| 14 | 2.45 | 11.8 | 2.37 | 8.5 | 2.26 | 4.9 | 2.18 | 2.9 |
| 15 | 2.43 | 10.9 | 2.37 | 8.5 | 2.26 | 4.9 | 2.17 | 2.7 |
| 16 | 2.43 | 10.9 | 2.36 | 8.1 | 2.26 | 4.9 | 2.17 | 2.7 |
| 17 | 2.55 | 16.8 | 2.35 | 7.8 | 2.26 | 4.9 | 2.17 | 2.7 |
| 18 | 2.74 | 31.0 | 2.35 | 7.8 | 2.26 | 4.9 | 2.17 | 2.7 |
| 19 | 2.72 | 29.0 | 2.35 | 7.8 | 2.26 | 4.9 | 2.18 | 2.9 |
| 20 | 2.65 | 23.0 | 2.34 | 7.4 | 2.26 | 4.9 | 2.18 | 2.9 |
| 21 | 2.64 | 23.0 | 2.33 | 7.0 | 2.26 | 4.9 | 2.18 | 2.9 |
| 22 | 2.60 | 19.6 | 2.33 | 7.0 | 2.25 | 4.6 | 2.19 | 3.1 |
| 23 | 2.60 | 19.6 | 2.33 | 7.0 | 2.25 | 4.6 | 2.20 | 3.3 |
| 24 | 2.55 | 16.8 | 2.33 | 7.0 | 2.24 | 4.4 | 2.20 | 3.3 |
| 25 | 2.50 | 14.0 | 2.33 | 7.0 | 2.23 | 4.1 | 2.21 | 3.6 |
| 26 | 2.48 | 13.1 | 2.32 | 6.7 | 2.21 | 3.6 | 2.21 | 3.6 |
| 27 | 2.50 | 14.0 | 2.30 | 6.0 | 2.19 | 3.1 | 2.21 | 3.6 |
| 28 | 2.55 | 16.8 | 2.28 | 5.5 | 2.19 | 3.1 | 2.21 | 3.6 |
| 29 | 2.60 | 19.6 | 2.26 | 4.9 | 2.19 | 3.1 | 2.21 | 3.6 |
| 30 | 2.60 | 19.6 | 2.26 | 4.9 | 2.19 | 3.1 | 2.21 | 3.6 |
| 31 | 2.58 | 18.5 | 2.26 | 4.9 | ..... | ..... | 2.21 | 3.6 |

MONTHLY DISCHARGE of Fairwell Creek at Drury's Ranch, for 1915.

(Drainage area 125 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (24-31) | 2.7 | 1.34 | 1.53 | 0.012 | 0.01 | 24 |
| April | 294.0 | 10.00 | 65.00 | 0.520 | 0.58 | 3,868 |
| May | 40.0 | 7.40 | 14.70 | 0.118 | 0.14 | 904 |
| June | 91.0 | 13.10 | 64.00 | 0.512 | 0.57 | 3,808 |
| July | 31.0 | 10.90 | 15.90 | 0.127 | 0.15 | 978 |
| August | 17.4 | 4.90 | 8.90 | 0.071 | 0.08 | 547 |
| September | 4.9 | 3.10 | 4.50 | 0.036 | 0.04 | 268 |
| October | 4.9 | 2.70 | 3.40 | 0.027 | 0.03 | 209 |
| The period | ... | .. | .. | | 1.60 | 10,806 |

A. M. CROSS DITCH FROM CALF CREEK.

*Location.*—On SE. ¼ Sec. 5, Tp. 8, Rge. 22, W. 3rd Mer.

*Records available.*—June 1 to September 13, 1914.

*Gauge*, Vertical staff, located about forty feet from the intake of the ditch. Elevation of the zero of the gauge has been maintained at 96.06 feet since establishment.

*Bench-mark.*—Is a poplar stump on the left bank of the ditch surrounded by a cairn of stones; assumed elevation 100.00 feet.

*Channel.*—Slightly shifting, owing to growth of weeds.
*Discharge measurements.*—Made with meter.
*Observer.*—A. M. Cross.
*Remarks.*—J. E. Caughey visited this station on June 15 and August 4, 1915, and reported no flow on both occasions.

### F. CROSS DITCH FROM NORTH BRANCH OF FRENCHMAN RIVER.

*Location.*On NW. ¼ Sec. 15, Tp. 7, Rge. 22, W. 3rd Mer., about 130 feet from the intake of the ditch.
*Records available.*—June 1912 to July 7, 1915.
*Gauge.*—Staff fastened to the left side of the flume. Elevation of zero maintained at 94.45 feet from establishment to July 27, 1915, and 96.63 feet since that date.
*Bench-mark.*—On July 27, 1915, a permanent iron bench-mark was set on the right bank about 10 feet north of the gauge. The assumed elevation is 100.00 feet.
*Discharge measurements.*—Made by meter at the section, or by a weir in the ditch.
*Observer.*—Frank Cross.

DISCHARGE MEASUREMENTS of F. Cross Ditch from North Branch of Frenchman River, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| June 15 | J. E. Caughey | 2.7 | 3.78 | 0.25 | 1.48 | 0.92 |
| Aug. 3 | do | ..... | ..... | ..... | ..... | Nil. |

DAILY GAUGE HEIGHT AND DISCHARGE of F. Cross Ditch from North Branch of Frenchman River, for 1915.

| Day | May. | | June. | | July. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.60 | 1.08 | 1.46 | 0.90 |
| 2 | ..... | ..... | .....c | ..... | 1.46 | 0.90 |
| 3 | ..... | ..... | ..... | ..... | 1.44 | 0.88 |
| 4 | ..... | ..... | ..... | ..... | 1.46 | 0.90 |
| 5 | ..... | ..... | ..... | ..... | 1.44 | 0.88 |
| 6 | ..... | ..... | ..... | ..... | 1.44 | 0.88 |
| 7 | ..... | ..... | ..... | ..... | 1.44 | 0.88 |
| 8 | ..... | ..... | ..... | ..... | .....c | ..... |
| 9 | ..... | ..... | ..... | ..... | ..... | ..... |
| 10 | ..... | ..... | ..... | ..... | ..... | ..... |
| 11 | ..... | ..... | ..... | ..... | ..... | ..... |
| 12 | ..... | ..... | ..... | ..... | ..... | ..... |
| 13 | ..... | ..... | ..... | ..... | ..... | ..... |
| 14 | ..... | ..... | 1.42*a* | 0.85 | ..... | ..... |
| 15 | ..... | ..... | 1.46 | 0.90 | ..... | ..... |
| 16 | ..... | ..... | 1.46 | 0.90 | ..... | ..... |
| 17 | ..... | ..... | 1.50 | 0.95 | ..... | ..... |
| 18 | ..... | ..... | 1.46 | 0.90 | ..... | ..... |
| 19 | ..... | ..... | 1.46 | 0.90 | ..... | ..... |
| 20 | ..... | ..... | .....c | ..... | ..... | ..... |
| 21 | ..... | ..... | ..... | ..... | ..... | ..... |
| 22 | ..... | ..... | ..... | ..... | ..... | ..... |
| 23 | ..... | ..... | ..... | ..... | ..... | ..... |
| 24 | 1.50*a* | 0.95 | 1.42*a* | 0.85 | ..... | ..... |
| 25 | 1.50 | 0.95 | 1.42 | 0.85 | ..... | ..... |
| 26 | 1.67 | 1.18 | 1.50 | 0.95 | ..... | ..... |
| 27 | 1.58 | 1.05 | 1.44 | 0.88 | ..... | ..... |
| 28 | 1.50 | 0.95 | 1.44 | 0.88 | ..... | ..... |
| 29 | 1.50 | 0.95 | 1.42 | 0.85 | ..... | ..... |
| 30 | .....c | ..... | 1.42 | 0.85 | ..... | ..... |
| 31 | 1.50*a* | 0.95 | ..... | ..... | ..... | ..... |

*a* Headgate opened.
*c* Headgate closed.

MONTHLY DISCHARGE of F. Cross Ditch from North Branch of Frenchman River, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| May (24-29, 31) | 1.18 | 0.95 | 1.00 | 14.00 |
| June (1, 14-20, 24-30) | 0.95 | 0.85 | 0.90 | 25.00 |
| July (1-7) | 0.90 | 0.88 | 0.89 | 12.00 |
| The period | ..... | ..... | ..... | 51.00 |

NORTH BRANCH OF FRENCHMAN RIVER AT CROSS' RANCH.

*Location.*—On NE. ¼ Sec. 16, Tp. 7, Rge. 22, W. 3rd Mer., at F. Cross' ranch near East End.

*Records available.*—August 1, 1908, to October 31, 1915.

*Gauge.*—Vertical staff. The elevation of zero maintained at 91.28 feet during 1908–11; the elevation of zero maintained at 90.27 feet during 1912–15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Sandy and slightly shifting.

*Discharge measurements.*—Made by wading.

*Winter flow.*—Station not maintained during winter.

*Diversions.*—F. Cross and A. M. Cross divert water above this station for irrigation. F. Cross was the only one to divert water during 1915.

*Observer.*—Frank Cross.

DISCHARGE MEASUREMENTS of North Branch of Frenchman River at Cross' Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft* |
| April 5 | M. H. French | 10.2 | 14.33 | 5.33 | 2.75 | 76.0 |
| April 8 | do | 13.0 | 6.50 | 2.24 | 1.11 | 14.6 |
| April 15 | do | 12.5 | 9.25 | 1.22 | 0.93 | 11.2 |
| May 7 | J. E. Caughey | 11.3 | 7.74 | 0.99 | 0.85 | 7.6 |
| June 15 | do | 11.5 | 8.07 | 1.12 | 0.78 | 9.1 |
| July 12 | do | 11.5 | 7.70 | 0.97 | 0.73 | 7.4 |
| Aug. 3 | do | 11.5 | 7.72 | 0.96 | 0.74 | 7.4 |
| Aug. 23 | do | 12.0 | 7.55 | 1.02 | 0.71 | 7.7 |
| Sept. 11 | G. H. Whyte and J. E. Caughey | 11.2 | 7.13 | 1.10 | 0.72 | 7.9 |
| Sept. 24 | J. E. Caughey | 11.5 | 7.40 | 1.01 | 0.72 | 7.5 |
| Oct. 13 | do | 11.5 | 7.35 | 1.27 | 0.73 | 9.4 |
| Oct. 28 | do | 11.5 | 7.87 | 1.30 | 0.72 | 10.2 |

DAILY GAUGE HEIGHT AND DISCHARGE of North Branch of Frenchman River at Cross' Ranch, for 1915.

| Day. | April. | | May. | | June. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 0.85 | 8.2 | 0.79 | 8.5 |
| 2 | ..... | ..... | 0.84 | 8.0 | 1.45 | 23.0 |
| 3 | ..... | ..... | 0.84 | 8.0 | 1.15 | 15.6 |
| 4 | 3.92 | 157.0 | 0.83 | 7.6 | 1.16 | 16.0 |
| 5 | 2.54 | 63.0 | 0.83 | 7.6 | 0.98 | 12.2 |
| 6 | 1.55 | 25.0 | 0.84 | 7.6 | 0.94 | 11.7 |
| 7 | 1.35 | 20.0 | 0.84 | 7.5 | 0.86 | 10.2 |
| 8 | 1.31 | 19.0 | 0.84 | 7.5 | 0.85 | 10.2 |
| 9 | 1.09 | 14.1 | 0.83 | 7.5 | 0.83 | 9.9 |
| 10 | 1.03 | 12.8 | 0.83 | 7.5 | 0.81 | 9.7 |
| 11 | 0.99 | 12.0 | 0.82 | 7.5 | 0.83 | 10.1 |
| 12 | 0.97 | 11.7 | 0.81 | 7.4 | 0.84 | 10.2 |
| 13 | 0.99 | 12.0 | 0.82 | 7.6 | 0.79 | 9.6 |
| 14 | 0.97 | 11.7 | 0.95 | 9.7 | 0.74 | 8.7 |
| 15 | 0.94 | 11.1 | 1.15 | 13.7 | 0.76 | 9.0 |
| 16 | 0.94*a* | 10.9 | 1.30 | 17.0 | 0.76 | 9.0 |
| 17 | 0.94 | 10.9 | 1.00 | 10.9 | 0.81 | 9.9 |
| 18 | 0.92 | 10.4 | 0.88 | 8.9 | 0.78 | 9.4 |
| 19 | 0.92 | 10.4 | 0.86 | 8.7 | 0.79 | 9.4 |
| 20 | 0.91 | 10.1 | 0.85 | 8.5 | 1.22 | 18.0 |
| 21 | 0.89 | 9.7 | 0.86 | 8.9 | 0.93 | 11.8 |
| 22 | 0.89 | 9.6 | 0.86 | 8.9 | 0.85 | 10.2 |
| 23 | 0.89 | 9.6 | 0.85 | 8.9 | 0.83 | 9.9 |
| 24 | 0.90 | 9.6 | 0.76 | 7.5 | 0.75 | 8.5 |
| 25 | 0.89 | 9.4 | 0.78 | 8.0 | 0.75 | 8.5 |
| 26 | 0.89 | 9.2 | 1.16 | 15.0 | 0.91 | 11.1 |
| 27 | 0.88 | 9.0 | 0.99 | 11.7 | 0.86 | 10.2 |
| 28 | 0.86 | 8.5 | 0.81 | 8.5 | 0.75 | 8.4 |
| 29 | 0.85 | 8.4 | 0.86 | 9.6 | 0.74 | 8.1 |
| 30 | 0.84 | 8.1 | 0.90 | 10.2 | 0.72 | 7.8 |
| 31 | ..... | ..... | 0.80 | 8.7 | ..... | ..... |

*a* to *b* Shifting conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of North Branch of Frenchman River at Cross' Ranch, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 0.79 | 8.9 | 0.76 | 8.1 | 0.64 | 6.4 | 0.74 | 8.1 |
| 2 | 0.74 | 8.1 | 0.75 | 8.0 | 0.78 | 8.4 | 0.76 | 8.5 |
| 3 | 0.73 | 7.8 | 0.74 | 7.8 | 0.75 | 8.0 | 0.90 | 11.1 |
| 4 | 0.80 | 8.9 | 0.74 | 7.8 | 0.74 | 7.8 | 0.86 | 10.4 |
| 5 | 0.74 | 7.8 | 0.73 | 7.6 | 0.74 | 7.8 | 0.84 | 10.2 |
| 6 | 0.73 | 7.6 | 0.71 | 7.4 | 0.73 | 7.6 | 0.83 | 10.2 |
| 7 | 0.73 | 7.5 | 0.71 | 7.4 | 0.72 | 7.5 | 0.82 | 10.2 |
| 8 | 1.00 | 12.0 | 0.68 | 6.9 | 0.75 | 8.0 | 0.79 | 9.9 |
| 9 | 0.85 | 9.4 | 0.67 | 6.8 | 0.80 | 8.7 | 0.75 | 9.4 |
| 10 | 0.84 | 9.0 | 0.66 | 6.7 | 0.75 | 8.0 | 0.73 | 9.0 |
| 11 | 0.80 | 8.4 | 0.66 | 6.7 | 0.73 | 7.6 | 0.77 | 9.9 |
| 12 | 0.73*b* | 7.4 | 0.68 | 6.9 | 0.76 | 8.1 | 0.74 | 9.4 |
| 13 | 0.71 | 7.4 | 0.67 | 6.8 | 0.78 | 8.4 | 0.73 | 9.4 |
| 14 | 0.74 | 7.8 | 0.67 | 6.8 | 0.81 | 8.9 | 0.73 | 9.4 |
| 15 | 0.84 | 9.4 | 0.67 | 6.8 | 0.79 | 8.5 | 0.73 | 9.4 |
| 16 | 0.76 | 8.1 | 0.67 | 6.8 | 0.76 | 8.1 | 0.72 | 9.4 |
| 17 | 0.84 | 9.4 | 0.67 | 6.8 | 0.74 | 7.8 | 0.72 | 9.4 |
| 18 | 0.90 | 10.4 | 0.68 | 6.9 | 0.74 | 7.8 | 0.72 | 9.4 |
| 19 | 0.80 | 8.7 | 1.30 | 18.8 | 0.73 | 7.6 | 0.72 | 9.4 |
| 20 | 0.76 | 8.1 | 0.85 | 9.6 | 0.75 | 8.0 | 0.72 | 9.4 |
| 21 | 0.75 | 8.0 | 0.74 | 7.8 | 0.74 | 7.8 | 0.72 | 9.6 |
| 22 | 0.74 | 7.8 | 0.73 | 7.6 | 0.73 | 7.6 | 0.72 | 9.6 |
| 23 | 0.79 | 8.5 | 0.70 | 7.2 | 0.73*a* | 7.5 | 0.72 | 9.6 |
| 24 | 0.84 | 9.4 | 0.70 | 7.2 | 0.73 | 7.5 | 0.73 | 9.6 |
| 25 | 0.78 | 8.4 | 0.69 | 7.1 | 0.73 | 7.5 | 0.83 | 11.7 |
| 26 | 0.76 | 8.1 | 0.68 | 6.9 | 0.73 | 7.5 | 0.76 | 10.6 |
| 27 | 0.94 | 11.1 | 0.67 | 6.8 | 0.74 | 7.8 | 0.75 | 10.6 |
| 28 | 0.78 | 8.4 | 0.66 | 6.7 | 0.75 | 8.1 | 0.73 | 10.2 |
| 29 | 0.82 | 9.0 | 0.65 | 6.6 | 0.74 | 8.1 | 0.73 | 10.2 |
| 30 | 0.82 | 9.0 | 0.65 | 6.6 | 0.74 | 8.1 | 0.72 | 10.1 |
| 31 | 0.76 | 8.1 | 0.64 | 6.4 | .... | . | 0.72*b* | 10.1 |

*a–b* Shifting conditions.

MONTHLY DISCHARGE of North Branch of Frenchman River at Cross' Ranch, for 1915.

(Drainage area 53 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per Square Mile | Depth in inches on Drainage Area | Total in Acre-feet |
| April (4–30) | 157.0 | 8.1 | 19.0 | 0.358 | 0.36 | 1,017 |
| May | 17.0 | 7.4 | 9.1 | 0.172 | 0.20 | 560 |
| June | 23.0 | 8.1 | 10.8 | 0.204 | 0.21 | 643 |
| July | 12.0 | 7.4 | 8.6 | 0.162 | 0.19 | 529 |
| August | 18.8 | 6.4 | 7.5 | 0.142 | 0.16 | 461 |
| September | 8.9 | 6.4 | 7.9 | 0.149 | 0.17 | 470 |
| October | 11.7 | 8.1 | 9.8 | 0.185 | 0.21 | 601 |
| The period | ... | | . | | 1.52 | 4,283 |

### W. H. BARNETT DITCH NEAR EAST END.

*Location.*—On the SE. ¼ Sec. 17, Tp. 7, Rge. 22, W. 3rd Mer., near East End Post Office.

*Gauge.*—Vertical staff, attached to a 4-inch round post driven into the bottom of the ditch about 100 feet S. 70°00E. from the flume. Zero elevation maintained at 98.13 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark, about 1½ ft. from the right bank of the ditch and 2.0 ft. below the gauge. Assumed elevation, 100.00 feet.

*Channel.*—One channel, clay bed.

*Discharge measurements.*—Made with a weir.

*Observer.*—W. H. Barnett.

*Remarks.*—This station was established on July 26, 1915, by M. H. French. No records were obtained in 1915.

### BARROBY DITCH NEAR RAVENSCRAG.

*Location.*—On SE. ¼ Sec. 33, Tp. 6, Rge. 23, W. 3rd Mer.

*Gauge.*—Vertical staff, nailed to a 4-inch round post driven into the left bank of the ditch about one-quarter mile S. 12° W. of the dam. Zero elevation maintained at 97.67 feet since August 10, 1915.

*Bench-mark.*—Permanent iron bench-mark, situated 5 feet above the gauge and 1.5 feet from the right bank. Assumed elevation, 100.00 feet.

*Channel.*—One, bed of sandy loam.

*Discharge measurements.*—Made with meter or weir.

*Observer.*—Frank Barroby.

*Remarks.*—J. E. Caughey visited this station on May 13, and August 5, 1915, and reported no flow on each occasion.

### FRENCHMAN RIVER AT PHILLIPS' RANCH.

*Location.*—On the NE. ¼ Sec. 23, Tp. 6, Rge. 23, W. 3rd Mer., at A. Phillips' ranch near Ravenscrag.

*Records available.*—July 9, 1912, to October 31, 1915.

*Gauge.*—Vertical staff. The elevation of the zero of the gauge has been 90.02 feet since the station was established.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Permanent.

*Discharge measurements.*—Made by wading or from cable.

*Winter flow.*—Station not maintained during winter.

*Artificial control.*—A permanent control was established at this station during October, 1914, by which means more accurate records should be obtained at this station.

*Observer.*—A. T. Phillips.

DISCHARGE MEASUREMENTS of Frenchman River at Phillips' Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 10 | M. H. French | 51.0 | 52.45 | 3.68 | 2.63 | 194.0 |
| April 13 | do | 47.0 | 35.28 | 3.42 | 2.28 | 120.0 |
| April 20 | do | 41.0 | 22.19 | 2.89 | 1.89 | 64.0 |
| May 11 | J. E. Caughey | 22.0 | 21.10 | 1.35 | 1.55 | 28.0 |
| June 16 | do | 25.0 | 24.40 | 1.50 | 1.65 | 37.0 |
| July 14 | do | 29.0 | 28.85 | 1.72 | 1.76 | 50.0 |
| Aug. 5 | do | 24.0 | 22.90 | 1.24 | 1.61 | 35.0 |
| Aug. 25 | do | 23.0 | 18.90 | 1.09 | 1.43 | 21.0 |
| Sept. 10 | G. H. Whyte & J. E. Caughey | 24.0 | 20.50 | 1.14 | 1.46 | 23.0 |
| Sept. 25 | J. E. Caughey | 23.0 | 17.80 | 1.02 | 1.39 | 18.3 |
| Oct. 14 | do | 25.0 | 20.75 | 1.35 | 1.50 | 28.3 |
| Oct. 28 | do | 23.0 | 20.20 | 1.39 | 1.46 | 28.0 |

DAILY GAUGE HEIGHT AND DISCHARGE of Frenchman River at Phillips' Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 3.06 | 68 | 1.64 | 37 | 1.72 | 45 |
| 2 | ..... | ..... | 4.60 | 154 | 1.63 | 36 | 2.02 | 81 |
| 3 | ..... | ..... | 9.93 | 1,366 | 1.63 | 36 | 2.67 | 204 |
| 4 | ..... | ..... | 8.73 | 2,668 | 1.61 | 35 | 2.60 | 186 |
| 5 | ..... | ..... | 6.96 | 2,263*b* | 1.61 | 35 | 2.37 | 136 |
| 6 | ..... | ..... | 4.82 | 945 | 1.61 | 35 | 2.19 | 106 |
| 7 | ..... | ..... | 3.71 | 498 | 1.58 | 32 | 2.09 | 91 |
| 8 | ..... | ..... | 3.10 | 308 | 1.57 | 31 | 2.02 | 81 |
| 9 | ..... | ..... | 2.84 | 244 | 1.58 | 32 | 1.88 | 63 |
| 10 | ..... | ..... | 2.66 | 200 | 1.55 | 30 | 1.76 | 49 |
| 11 | ..... | ..... | 2.48 | 159 | 1.59 | 33 | 1.74 | 47 |
| 12 | ..... | ..... | 2.36 | 135 | 1.52 | 27 | 1.73 | 46 |
| 13 | ..... | ..... | 2.32 | 128 | 1.55 | 30 | 1.72 | 45 |
| 14 | ..... | ..... | 2.31 | 125 | 1.65 | 38 | 1.66 | 39 |
| 15 | ..... | ..... | 2.25 | 115 | 1.81 | 55 | 1.68 | 41 |
| 16 | ..... | ..... | 2.13 | 96 | 2.00 | 78 | 1.68 | 41 |
| 17 | ..... | ..... | 2.05 | 85 | 2.12 | 95 | 1.69 | 42 |
| 18 | ..... | ..... | 2.02 | 81 | 2.38 | 138 | 1.66 | 39 |
| 19 | ..... | ..... | 1.96 | 73 | 1.87 | 62 | 1.70 | 43 |
| 20 | ..... | ..... | 1.91 | 66 | 1.72 | 45 | 2.10 | 92 |
| 21 | ..... | ..... | 1.84 | 58 | 1.70 | 43 | 2.28 | 120 |
| 22 | 3.47 | 10*a* | 1.80 | 54 | 1.67 | 40 | 2.32 | 127 |
| 23 | 3.72 | 68 | 1.80 | 54 | 1.64 | 37 | 1.92 | 68 |
| 24 | 3.75 | 72 | 1.78 | 51 | 1.63 | 36 | 1.78 | 51 |
| 25 | 3.50 | 77 | 1.76 | 49 | 1.74 | 47 | 1.74 | 47 |
| 26 | 3.72 | 80 | 1.74 | 47 | 1.86 | 60 | 1.76 | 49 |
| 27 | 3.49 | 84 | 1.72 | 45 | 2.06 | 86 | 1.78 | 51 |
| 28 | 3.19 | 80 | 1.70 | 43 | 1.94 | 70 | 1.86 | 60 |
| 29 | 3.19 | 76 | 1.67 | 40 | 1.86 | 60 | 1.76 | 49 |
| 30 | 3.19 | 74 | 1.64 | 37 | 1.80 | 54 | 1.74 | 47 |
| 31 | 3.08 | 71 | ..... | ..... | 1.76 | 49 | ..... | ..... |

*a–b* Flood and ice conditions. Discharge estimated from measurements at East End.

DAILY GAUGE HEIGHT AND DISCHARGE of Frenchman River at Phillips' Ranch, for 1915. —*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.64 | 37 | 1.82 | 56.0 | 1.34 | 15.4 | 1.42 | 20.0 |
| 2 | 1.64 | 37 | 1.74 | 47.0 | 1.39 | 18.4 | 1.41 | 19.7 |
| 3 | 1.63 | 36 | 1.68 | 41.0 | 1.48 | 24.0 | 1.50 | 26.0 |
| 4 | 1.64 | 37 | 1.66 | 39.0 | 1.50 | 26.0 | 1.49 | 25.0 |
| 5 | 1.63 | 36 | 1.61 | 35.0 | 1.50 | 26.0 | 1.48 | 24.0 |
| 6 | 1.63 | 36 | 1.59 | 33.0 | 1.46 | 23.0 | 1.48 | 24.0 |
| 7 | 1.62 | 35 | 1.56 | 30.0 | 1.45 | 22.0 | 1.50 | 26.0 |
| 8 | 1.70 | 43 | 1.54 | 29.0 | 1.44 | 22.0 | 1.49 | 25.0 |
| 9 | 1.74 | 47 | 1.52 | 27.0 | 1.45 | 22.0 | 1.50 | 26.0 |
| 10 | 1.92 | 68 | 1.50 | 26.0 | 1.48 | 24.0 | 1.50 | 26.0 |
| 11 | 2.30 | 124 | 1.48 | 24.0 | 1.45 | 22.0 | 1.54 | 29.0 |
| 12 | 1.92 | 68 | 1.48 | 24.0 | 1.46 | 23.0 | 1.54 | 29.0 |
| 13 | 1.76 | 49 | 1.46 | 23.0 | 1.48 | 24.0 | 1.53 | 28.0 |
| 14 | 1.76 | 49 | 1.44 | 22.0 | 1.51 | 26.0 | 1.52 | 27.0 |
| 15 | 1.78 | 51 | 1.44 | 22.0 | 1.51 | 26.0 | 1.48 | 24.0 |
| 16 | 1.88 | 63 | 1.49 | 25.0 | 1.50 | 26.0 | 1.48 | 24.0 |
| 17 | 1.98 | 75 | 1.46 | 23.0 | 1.46 | 23.0 | 1.46 | 23.0 |
| 18 | 1.99 | 77 | 1.47 | 24.0 | 1.44 | 22.0 | 1.45 | 22.0 |
| 19 | 2.14 | 98 | 1.48 | 24.0 | 1.42 | 20.0 | 1.45 | 22.0 |
| 20 | 2.04 | 84 | 1.68 | 41.0 | 1.42 | 20.0 | 1.45 | 22.0 |
| 21 | 1.90 | 65 | 1.56 | 30.0 | 1.42 | 20.0 | 1.45 | 22.0 |
| 22 | 1.86 | 60 | 1.50 | 26.0 | 1.42 | 20.0 | 1.45 | 22.0 |
| 23 | 1.95 | 72 | 1.46 | 23.0 | 1.40 | 19.0 | 1.44 | 22.0 |
| 24 | 1.76 | 49 | 1.44 | 22.0 | 1.39 | 18.4 | 1.44 | 22.0 |
| 25 | 1.74 | 47 | 1.42 | 20.0 | 1.39 | 18.4 | 1.44 | 22.0 |
| 26 | 1.76 | 49 | 1.39 | 18.4 | 1.39 | 18.4 | 1.45 | 22.0 |
| 27 | 1.82 | 56 | 1.34 | 15.4 | 1.40 | 19.0 | 1.45 | 22.0 |
| 28 | 1.80 | 54 | 1.30 | 13.0 | 1.43 | 21.0 | 1.45 | 22.0 |
| 29 | 2.04 | 84 | 1.30 | 13.0 | 1.44 | 22.0 | 1.45 | 22.0 |
| 30 | 2.06 | 86 | 1.30 | 13.0 | 1.42 | 20.0 | 1.46 | 23.0 |
| 31 | 1.95 | 72 | 1.32 | 14.2 | ..... | ..... | 1.45 | 22.0 |

MONTHLY DISCHARGE of Frenchman River at Phillips' Ranch, for 1915.

(Drainage area 598 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (22–31) | 84 | 10.0 | 69 | 0.115 | 0.04 | 1,368 |
| April | 2,668 | 37.0 | 342 | 0.572 | 0.64 | 20,350 |
| May | 138 | 27.0 | 49 | 0.082 | 0.09 | 3,013 |
| June | 204 | 39.0 | 73 | 0.122 | 0.14 | 4,344 |
| July | 124 | 35.0 | 60 | 0.100 | 0.12 | 3,689 |
| August | 56 | 13.0 | 27 | 0.045 | 0.05 | 1,660 |
| September | 26 | 15.4 | 22 | 0.037 | 0.04 | 1,309 |
| October | 29 | 19.7 | 24 | 0.040 | 0.05 | 1,476 |
| The period | ..... | ..... | ..... | ..... | 1.17 | 37,209 |

STRONG DITCH AT EAST END.

*Location.*—On the NE. ¼ Sec. 25, Tp. 6, Rge. 22, W. 3rd Mer., about one-half mile below the headgate of the ditch.

*Records available.*—May 9, 1909, to December 31, 1915.

*Gauge.*—Vertical staff, fastened to a post on the right bank.

*Bench-marks.*—(1) A spike on the initial post which is about six inches above ground, on the left bank of the ditch. Elevation. 5.49 feet above the zero of the gauge. (2) The top of plug about four inches above ground on the right bank and about 50 feet downstream from the gauge. Elevation, 7.52 feet above the zero of the gauge.

*Channel.*—Slightly shifting and affected by weeds.

*Discharge measurements.*—Made by wading.

*Observer.*—John Burge.

DISCHARGE MEASUREMENTS of Strong Ditch at East End, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 10 | J. E. Caughey | 16.0 | 18.80 | 0.88 | 1.73 | 16.50 |
| June 14 | do | 14.0 | 13.60 | 0.80 | 1.55 | 10.90 |
| July 8 | do | 13.5 | 10.55 | 0.54 | 1.35 | 5.70 |
| Aug. 2 | do | 16.0 | 20.00 | 0.15 | 1.17 | 3.05 |
| Aug. 23 | do | 9.0 | 5.80 | 0.52 | 1.22 | 3.04 |
| Sept. 9 | G. H. Whyte & J. E. Caughey | ..... | ..... | ..... | ..... | Nil. |

DAILY GAUGE HEIGHT AND DISCHARGE of Strong Ditch at East End, for 1915.

| Day. | April. | | May. | | June. | | July. | | August. | | September. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge | Gauge Height. | Discharge | Gauge Height. | Discharge | Gauge Height. | Discharge | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 0.50 | 0.00 | 1.78 | 18.5 | 1.72 | 16.30 | 1.10 | 1.80 | 0.80 | 0.20 |
| 2 | ..... | ..... | 0.93 | 0.65 | 1.75 | 17.4 | 1.75 | 17.40 | 1.17c | 2.60 | 0.90 | 0.50 |
| 3 | ..... | ..... | 1.00 | 1.00 | 1.79 | 18.8 | 1.75 | 17.40 | 1.05 | 1.40 | 0.90 | 0.50 |
| 4 | ..... | ..... | 1.40 | 6.90 | 1.64 | 13.7 | 1.73 | 16.70 | 1.05 | 1.40 | 0.92 | 0.60 |
| 5 | ..... | ..... | 1.41 | 7.20 | 1.59 | 12.1 | 1.74 | 17.00 | 1.05 | 1.40 | 0.95 | 0.75 |
| 6 | ..... | ..... | 1.59 | 12.10 | 1.57 | 11.5 | 1.78 | 18.50 | 1.03 | 1.24 | 1.00 | 1.00 |
| 7 | ..... | ..... | 1.60 | 12.40 | 1.65 | 14.0 | 1.75 | 17.40 | 1.06 | 1.48 | 1.05 | 1.40 |
| 8 | ..... | ..... | 1.68 | 15.00 | 1.56 | 11.2 | 1.38 | 6.50 | 1.08 | 1.64 | 0.70b | Nil. |
| 9 | ..... | ..... | 1.73 | 16.70 | 1.56 | 11.2 | 1.35 | 5.80 | 1.00 | 1.00 | | |
| 10 | ..... | ..... | 1.70 | 15.60 | 1.54 | 10.7 | 1.36 | 6.00 | 1.04 | 1.32 | | |
| 11 | ..... | ..... | 1.70 | 15.60 | 1.54 | 10.7 | 1.06 | 1.48 | 1.05 | 1.40 | | |
| 12 | ..... | ..... | 1.70 | 15.60 | 1.52 | 10.1 | 1.24 | 3.70 | 1.05 | 1.40 | | |
| 13 | ..... | ..... | 1.72 | 16.30 | 1.52 | 10.1 | 1.52 | 10.10 | 1.04 | 1.32 | | |
| 14 | ..... | ..... | 1.80 | 19.20 | 1.55 | 11.0 | 1.53 | 10.40 | 1.02 | 1.16 | | |
| 15 | ..... | ..... | 1.75 | 17.40 | 1.54 | 10.7 | 1.75 | 17.40 | 1.08 | 1.64 | | |
| 16 | ..... | ..... | 1.68 | 15.00 | 1.54 | 10.7 | 1.80 | 19.20 | 1.09 | 1.72 | | |
| 17 | ..... | ..... | 1.65 | 14.00 | 1.56 | 11.2 | 1.82 | 20.00 | 1.02 | 1.16 | | |
| 18 | ..... | ..... | 1.60 | 12.40 | 1.58 | 11.8 | 1.90 | 23.00 | 1.04 | 1.32 | | |
| 19 | ..... | ..... | 1.66 | 14.30 | 1.61 | 12.7 | 1.89a | 23.00 | 1.00 | 1.00 | | |
| 20 | ..... | ..... | 1.70 | 15.60 | 1.65 | 14.0 | 1.95 | 25.00 | 1.00 | 1.00 | | |
| 21 | ..... | ..... | 1.69 | 15.30 | 1.64 | 13.7 | 2.00 | 27.00 | 1.00 | 1.00 | | |
| 22 | 0.69 | 0.00 | 1.68 | 15.00 | 1.63 | 13.4 | 1.95 | 25.00 | 1.20 | 3.00 | | |
| 23 | 0.73 | 0.06 | 1.60 | 12.40 | 1.64 | 13.7 | 1.95 | 25.00 | 1.22 | 3.30 | | |
| 24 | 0.78 | 0.16 | 1.65 | 14.00 | 1.60 | 12.4 | 1.93 | 24.00 | 1.24 | 3.70 | | |
| 25 | 0.83 | 0.29 | 1.75 | 17.40 | 1.65 | 14.0 | 1.75 | 17.40 | 1.22 | 3.30 | | |
| 26 | 0.83 | 0.29 | 1.80 | 19.20 | 1.64 | 13.7 | 1.70 | 15.60 | 1.30 | 4.70 | | |
| 27 | 0.84 | 0.32 | 1.81 | 19.60 | 1.64 | 13.7 | 1.65 | 14.00 | 1.33 | 5.40 | | |
| 28 | 0.92 | 0.60 | 1.84 | 21.00 | 1.69 | 15.3 | 1.50 | 9.50 | 1.19 | 2.90 | | |
| 29 | 1.32 | 5.10 | 1.89 | 23.00 | 1.72 | 16.3 | 1.30 | 4.70 | 1.14 | 2.30 | | |
| 30 | 0.74 | 0.08 | 1.85 | 21.00 | 1.72 | 16.3 | 1.25 | 3.80 | 1.10 | 1.80 | | |
| 31 | ..... | ..... | 1.80 | 19.20 | ..... | ..... | 1.08 | 1.60 | 0.90 | 0.50 | | |

*a* to *b* Beaver dams disturbed gauge readings.
*c* Hydrometric engineer's readings.

MONTHLY DISCHARGE of Strong Ditch at East End, for 1915.

| MONTH. | DISCHARGE IN SECOND-FEET. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| April (22-30) | 5.10 | 0.06 | 0.77 | 14 |
| May | 23.00 | 0.65 | 14.00 | 861 |
| June | 18.80 | 10.10 | 13.00 | 774 |
| July | 27.00 | 1.48 | 15.00 | 922 |
| August | 5.40 | 0.50 | 1.94 | 119 |
| September (1-8) | 1.40 | 0.20 | 0.63 | 10 |
| The period | ..... | ..... | ..... | 2,700 |

FRENCHMAN RIVER AT EAST END.

*Location.*—On the SE. ¼ Sec. 31, Tp. 6, Rge. 21, W. 3rd Mer., at the Canadian Pacific Railway bridge about one-half mile east of the East End depot.

*Records available.*—April 21, 1909, to October 31, 1915.

*Gauge.*—Vertical staff fastened to the downstream pile of the fifth bent from the west end of the bridge. The elevation of the zero of the gauge is 2958.84 feet above sea level.

*Bench-mark.*—On July 31, 1915, a permanent iron bench-mark was set on the left bank above high water mark, 30 feet from the edge of the cut-bank and near the gate on the Royal Northwest Mounted Police grounds. Referring to the Canadian Pacific Railway datum the elevation is 2975.19 feet above sea level.

*Channel.*—Permanent.

*Discharge measurements.*—Made by wading or from a bridge.

*Winter flow.*—Station not maintained in winter.

*Artificial control.*—A permanent control for the gauge was established during October, 1914, one-quarter mile downstream from the gauge at the bridge.

*Diversions.*—Mr. J. C. Strong diverts water for irrigation purposes about two miles upstream from this station. A small amount returns to the river channel, above the gauge.

*Observers.*—S. B. C. Gooch and John Burge.

DISCHARGE MEASUREMENTS of Frenchman River at East End, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 16 | M. H. French | 21.0 | 17.15 | 1.06 | 3.20 | 18.2 |
| Mar. 25 | do | 24.0 | 32.90 | 2.34 | 3.50 | 77.0 |
| Mar. 27 | do | 47.0 | 36.05 | 2.33 | 3.30 | 84.0 |
| April 1 | do | 27.0 | 33.05 | 2.04 | 3.02 | 68.0 |
| April 2 | do | 47.0 | 72.40 | 1.89 | 3.65 | 137.0 |
| April 4 | do | 96.3 | 551.20 | 4.98 | 10.35 | 2,750.0 |
| April 5 | do | 37.3 | 428.70 | 4.76 | 9.35 | 2,042.0 |
| April 6 | do | 37.3 | 291.00 | 3.68 | 5.95 | 1,070.0 |
| April 9 | do | 65.0 | 65.75 | 3.89 | 3.09 | 256.0 |
| April 14 | do | 60.0 | 37.30 | 3.57 | 2.52 | 134.0 |
| April 15 | do | 61.0 | 38.18 | 3.67 | 2.50 | 141.0 |
| April 19 | do | 53.0 | 55.73 | 1.46 | 2.16 | 82.0 |
| May 8 | J. E. Caughey | 17.0 | 8.75 | 1.71 | 1.43 | 15.0 |
| June 14 | do | 21.0 | 15.40 | 2.60 | 1.72 | 40.0 |
| July 8 | do | 21.0 | 14.80 | 2.48 | 1.67 | 37.0 |
| July 30 | do | 21.0 | 26.70 | 3.02 | 2.11 | 81.0 |
| Aug. 21 | do | 20.0 | 14.05 | 2.47 | 1.69 | 35.0 |
| Sept. 9 | G. H. Whyte and J. E. Caughey | 20.0 | 10.55 | 2.72 | 1.58 | 29.0 |
| Sept. 22 | J. E. Caughey | 17.5 | 9.50 | 2.18 | 1.52 | 21.0 |
| Oct. 12 | do | 19.5 | 12.75 | 2.52 | 1.65 | 32.0 |
| Oct. 26 | do | 17.5 | 9.97 | 2.84 | 1.56 | 28.0 |

DAILY GAUGE HEIGHT AND DISCHARGE of Frenchman River at East End, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 3.04 | 68.0 | 1.83 | 49.0 | 1.63 | 31 |
| 2 | ..... | ..... | 3.73 | 154.0 | 1.43 | 16.4 | 2.50 | 142 |
| 3 | ..... | ..... | 7.79 | 1366.0 | 1.40 | 14.4 | 2.61 | 162 |
| 4 | ..... | ..... | 10.32 | 2669.0 | 1.41 | 15.1 | 2.62 | 164 |
| 5 | ..... | ..... | 9.66 | 2263.0 | 1.40 | 14.4 | 2.59 | 158 |
| 6 | ..... | ..... | 5.70 | 975.0 | 1.40 | 14.4 | 2.38 | 120 |
| 7 | ..... | ..... | 4.48 | 594.0 | 1.38 | 13.3 | 2.15 | 84 |
| 8 | ..... | ..... | 3.46 | 335.0 | 1.43 | 16.4 | 2.13 | 81 |
| 9 | ..... | ..... | 3.06 | 252.0 | 1.46 | 18.4 | 1.99 | 65 |
| 10 | ..... | ..... | 2.92 | 221.0 | 1.47 | 19.0 | 2.00 | 66 |
| 11 | ..... | ..... | 2.71 | 182.0 | 1.45 | 17.7 | 1.98 | 64 |
| 12 | ..... | ..... | 2.55 | 151.0 | 1.43 | 16.4 | 1.96 | 62 |
| 13 | ..... | ..... | 2.46 | 135.0 | 1.42 | 15.7 | 1.85 | 51 |
| 14 | ..... | ..... | 2.50 | 142.0 | 1.54 | 24.0 | 1.72 | 39 |
| 15 | ..... | ..... | 2.48 | 138.0 | 2.25 | 98.0 | 1.71 | 38 |
| 16 | 3.20 | 18.2 | 2.00*a* | 66.0 | 2.94 | 228.0 | 1.72 | 39 |
| 17 | 3.20*c* | 18.2 | 2.52*b* | 146.0 | 2.05 | 72.0 | 1.67 | 35 |
| 18 | 3.10 | 19.2 | 2.24 | 96.0 | 2.15 | 84.0 | 1.62 | 30 |
| 19 | 3.00 | 17.2 | 2.16 | 85.0 | 2.05 | 72.0 | 1.66 | 34 |
| 20 | 3.00 | 19.8 | 2.14 | 82.0 | 1.74 | 41.0 | 1.87 | 53 |
| 21 | 2.90 | 26.0 | 2.10 | 77.0 | 1.70 | 37.0 | 2.17 | 86 |
| 22 | 2.90 | 20.0*b* | 2.01 | 67.0 | 1.69 | 36.0 | 2.35 | 115 |
| 23 | 3.30 | 68.0*b* | 1.62 | 30.0 | 1.67 | 35.0 | 2.22 | 93 |
| 24 | 4.36 | 134.0 | 1.42 | 15.7 | 1.40 | 14.4 | 2.21 | 92 |
| 25 | 3.63 | 77.0 | 1.46 | 18.4 | 1.47 | 19.0 | 2.24 | 96 |
| 26 | 3.25 | 55.0 | 1.80 | 46.0 | 1.81 | 47.0 | 2.22 | 93 |
| 27 | 3.35 | 84.0 | 1.79 | 46.0 | 1.80 | 46.0 | 1.62 | 30 |
| 28 | 3.07 | 80.0*b* | 1.76 | 43.0 | 1.95 | 61.0 | 2.02 | 68 |
| 29 | 3.00 | 76.0*b* | 1.70 | 37.0 | 1.98 | 64.0 | 2.01 | 67 |
| 30 | 2.90 | 74.0*b* | 1.95 | 61.0 | 1.95 | 61.0 | 2.03 | 69 |
| 31 | 2.76 | 71.0*b* | ..... | ..... | 1.87 | 53.0 | ..... | ..... |

*a* Flash boards put in dam.
*b* Flash boards went out.
*c* Gauge height and discharge interpolated.
*b* Discharge interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of Frenchman River at East End, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.79 | 45 | 2.02 | 68.0 | 1.44 | 17.0 | 1.54 | 24 |
| 2 | 1.75*d* | 42 | 1.97 | 63.0 | 1.45 | 17.7 | 1.53 | 23 |
| 3 | 1.72 | 39 | 1.95 | 61.0 | 1.47 | 19.0 | 1.55 | 25 |
| 4 | 1.71 | 38 | 1.87 | 53.0 | 1.47 | 19.0 | 1.53 | 23 |
| 5 | 1.71 | 38 | 1.83 | 49.0 | 2.35 | 115.0 | 1.53 | 23 |
| 6 | 1.74 | 41 | 1.72 | 39.0 | 2.05 | 72.0 | 1.55 | 25 |
| 7 | 1.77 | 44 | 1.71 | 38.0 | 1.75 | 42.0 | 1.54 | 24 |
| 8 | 1.70 | 37 | 1.72 | 39.0 | 1.64 | 32.0 | 1.54 | 24 |
| 9 | 1.76 | 43 | 1.62 | 30.0 | 1.60 | 29.0 | 1.55 | 25 |
| 10 | 1.77 | 44 | 1.60 | 29.0 | 1.56 | 26.0 | 1.55 | 25 |
| 11 | 2.07 | 74 | 1.55 | 25.0 | 1.58 | 27.0 | 1.55 | 25 |
| 12 | 2.02 | 68 | 1.55 | 25.0 | 1.60 | 29.0 | 1.55 | 25 |
| 13 | 1.97 | 63 | 1.52 | 23.0 | 1.60 | 29.0 | 1.60 | 29 |
| 14 | 1.87 | 53 | 1.52 | 23.0 | 1.59 | 28.0 | 1.61 | 30 |
| 15 | 1.90 | 56 | 1.51 | 22.0 | 1.61 | 30.0 | 1.60 | 29 |
| 16 | 1.90 | 56 | 1.51 | 22.0 | 1.60 | 29.0 | 1.60 | 29 |
| 17 | 1.92 | 58 | 1.52 | 23.0 | 1.60 | 29.0 | 1.60 | 29 |
| 18 | 1.95 | 61 | 1.51 | 22.0 | 1.58 | 27.0 | 1.58 | 27 |
| 19 | 1.97 | 63 | 1.51 | 22.0 | 1.62 | 30.0 | 1.58 | 27 |
| 20 | 2.17 | 86 | 1.51 | 22.0 | 1.65 | 33.0 | 1.55 | 25 |
| 21 | 2.12 | 80 | 1.69 | 36.0 | 1.60 | 29.0 | 1.58 | 27 |
| 22 | 2.10 | 77 | 1.67 | 35.0 | 1.55 | 25.0 | 1.56 | 26 |
| 23 | 2.05 | 72 | 1.64 | 32.0 | 1.54 | 24.0 | 1.55 | 25 |
| 24 | 2.02 | 68 | 1.56 | 26.0 | 1.55 | 25.0 | 1.53 | 23 |
| 25 | 1.97 | 63 | 1.54 | 24.0 | 1.53 | 23.0 | 1.53 | 23 |
| 26 | 1.97 | 63 | 1.49 | 20.0 | 1.53 | 23.0 | 1.55 | 25 |
| 27 | 1.95 | 61 | 1.47 | 19.0 | 1.54 | 24.0 | 1.57 | 26 |
| 28 | 1.92 | 58 | 1.47 | 19.0 | 1.54 | 24.0 | 1.57 | 26 |
| 29 | 1.92 | 58 | 1.45 | 17.7 | 1.55 | 25.0 | 1.56 | 26 |
| 30 | 2.05 | 72 | 1.45 | 17.7 | 1.54 | 24.0 | 1.54 | 24 |
| 31 | 2.13 | 81 | 1.44 | 17.0 | ..... | ..... | 1.54 | 24 |

*d* Gauge height interpolated.

MONTHLY DISCHARGE of Frenchman River at East End, for 1915.

(Drainage area 648 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (16-31) | 134 | 17.2 | 54 | 0.083 | 0.05 | 1,714 |
| April | 2,668 | 15.9 | 352 | 0.543 | 0.61 | 20,945 |
| May | 243 | 15.4 | 57 | 0.088 | 0.10 | 3,505 |
| June | 181 | 42.0 | 91 | 0.140 | 0.16 | 5,415 |
| July | 111 | 44.0 | 73 | 0.113 | 0.13 | 4,489 |
| August | 70 | 17.5 | 33 | 0.051 | 0.06 | 2,029 |
| September | 116 | 17.2 | 31 | 0.048 | 0.05 | 1,845 |
| October | 30 | 23.0 | 26 | 0.040 | 0.05 | 1,599 |
| The period | ..... | ..... | ..... | ..... | 1.21 | 41,541 |

NOTE.—This table shows the total discharge of the river and Strong's Ditch at this point.

MORRISON BROTHERS DITCH FROM FRENCHMAN RIVER.

*Location.*—On the SW. ¼ Sec. 26, Tp. 6, Rge. 21, W. 3rd Mer., about three miles downstream from East End.

*Records available.*—June 12 to August 28, 1913; May 25 to October 30, 1914; May 12 to June 27, 1915.

*Gauge.*—Vertical staff fastened to a post at the right bank about one-half mile from the headgate. The elevation of the zero of the gauge has been maintained at 97.36 feet since established.

*Bench-mark.*—Top of rock marked Bench-Mark in red, located on the left bank about three hundred feet upstream from the gauge. Assumed elevation, 100.00 feet.

*Channel.*—Slightly grown with weeds.

*Discharge measurements.*—Made with meter.

*Observer.*—A. A. Morrison.

DISCHARGE MEASUREMENTS of Morrison Brothers Ditch from Frenchman River, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec. ft.* |
| May 10 | J. E. Caughey | 6.0 | 3.80 | 0.53 | 0.25 | 2.03 |
| June 14 | do | 7.0 | 7.20 | 0.54 | 0.63 | 3.90 |
| July 9 | do | 6.2 | 4.35 | 0.52 | 0.43 | 2.30 |
| July 30 | do | ..... | ..... | ..... | ..... | Nil. |

DAILY GAUGE HEIGHT AND DISCHARGE of Morrison Brothers Ditch from Frenchman River, for 1915.

| Day. | May. | | June. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.08 | 8.6 |
| 2 | ..... | ..... | 1.08 | 8.6 |
| 3 | ..... | ..... | 1.08c | 8.6 |
| 4 | ..... | ..... | ..... | ..... |
| 5 | ..... | ..... | ..... | ..... |
| 6 | ..... | ..... | ..... | ..... |
| 7 | ..... | ..... | ..... | ..... |
| 8 | ..... | ..... | ..... | ..... |
| 9 | ..... | ..... | ..... | ..... |
| 10 | ..... | ..... | ..... | ..... |
| 11 | ..... | ..... | ..... | ..... |
| 12 | 0.50b | 2.8 | | |
| 13 | 0.50 | 2.8 | 0.50b | 2.8 |
| 14 | 0.58 | 3.5 | 0.50 | 2.8 |
| 15 | 0.79a | 5.4 | 0.50 | 2.8 |
| 16 | 1.00 | 7.6 | 0.50 | 2.8 |
| 17 | 1.00 | 7.6 | 0.50 | 2.8 |
| 18 | 1.08 | 8.6 | 0.50 | 2.8 |
| 19 | 1.08 | 8.6 | 1.00 | 7.6 |
| 20 | 0.83 | 5.9 | 1.00 | 7.6 |
| 21 | 0.83 | 5.9 | 1.08 | 8.6 |
| 22 | 0.75 | 5.0 | 1.00 | 7.6 |
| 23 | 0.67 | 4.3 | 0.96a | 7.2 |
| 24 | 0.50 | 2.8 | 0.92 | 6.8 |
| 25 | 0.50 | 2.8 | 0.92 | 6.8 |
| 26 | 0.92 | 6.8 | 0.83 | 5.9 |
| 27 | 0.92 | 6.8 | 0.83c | 5.9 |
| 28 | 1.00 | 7.6 | | |
| 29 | 1.00 | 7.6 | | |
| 30 | 1.03a | 8.0 | | |
| 31 | 1.06a | 8.3 | | |

a Gauge height interpolated.
b Headgate opened.
c Headgate closed

MONTHLY DISCHARGE of Morrison Brothers Ditch from Frenchman River, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| May (12-31) | 8.60 | 2.80 | 6.00 | 238 |
| June {1-3, 13-27} | 8.60 | 2.80 | 5.90 | 211 |
| The period | ..... | ..... | ..... | 449 |

MULE CREEK AT GUNN'S RANCH.

*Location.*—On the SW. ¼ Sec. 33, Tp. 5, Rge. 17, W. 3rd Mer.

*Records available.*—April 15, 1914, to October 31, 1915. Previous records at old station about one-half mile downstream from present site consist of discharge measurements made during 1911, 1912 and 1913.

*Gauge.*—Vertical staff. Zero elevation has been maintained at 92.46 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark, assumed elevation 100.00 feet.

*Discharge measurements.*—Made with meter; with weir at low stages.

*Channel.*—Probably permanent.

*Winter flow.*—This station is not maintained during the winter.

*Diversions.*—There is no diversion above this station.

*Observer.*—Wm. Gunn, Jr.

DISCHARGE MEASUREMENTS of Mule Creek at Gunn's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 20 | F. R. Steinberger | ..... | ..... | ..... | 0.11 | 0.24 |
| May 26 | do | 8.6 | 9.3 | 0.70 | 1.84 | 6.50 |
| June 29 | do | ..... | ..... | ..... | 0.15 | 0.38 |
| July 30 | do | ..... | ..... | ..... | 0.14 | 0.34 |
| Aug. 21 | do | ..... | ..... | ..... | 0.06 | 0.10 |
| Oct. 8 | do | ..... | ..... | ..... | 0.16 | 0.42 |

DAILY GAUGE HEIGHT AND DISCHARGE of Mule Creek at Gunn's Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 5.30 | 35.00 | 0.57 | 0.14 | 0.46 | 1.98 |
| 2 | ..... | ..... | 7.50 | 40.00*a* | 0.59 | 0.16 | 2.10 | 8.60 |
| 3 | ..... | ..... | 8.50 | 60.00 | 0.60 | 0.17 | 1.75 | 5.80 |
| 4 | ..... | ..... | 6.50 | 44.00 | 0.57 | 0.14 | 1.45 | 3.60 |
| 5 | ..... | ..... | 3.50 | 19.80 | 0.59 | 0.16 | 0.40*b* | 1.62 |
| 6 | ..... | ..... | 2.33 | 10.40 | 0.58 | 0.15 | 0.30*b* | 1.06 |
| 7 | ..... | ..... | 2.35 | 10.60 | 0.57 | 0.14 | 0.35*b* | 1.33 |
| 8 | ..... | ..... | 2.30 | 10.20 | 0.56 | 0.13 | 0.30*b* | 1.06 |
| 9 | ..... | ..... | 2.20 | 9.40 | 0.60 | 0.17 | 0.25*b* | 0.81 |
| 10 | ..... | ..... | 2.08 | 8.40 | 0.62 | 0.20 | 0.21*b* | 0.63 |
| 11 | ..... | ..... | 2.10 | 8.60 | 0.59 | 0.16 | 0.18*b* | 0.50 |
| 12 | ..... | ..... | 1.98 | 7.60 | 0.61 | 0.19 | 0.15*b* | 0.38 |
| 13 | ..... | ..... | 1.22 | 2.10 | 0.58 | 0.15 | 0.11*b* | 0.24 |
| 14 | ..... | ..... | 1.12 | 1.65 | 1.42 | 3.30 | 0.16*b* | 0.42 |
| 15 | ..... | ..... | 1.02 | 1.24 | 1.52 | 4.00 | 0.20*b* | 0.58 |
| 16 | ..... | ..... | 0.73 | 0.40 | 1.62 | 4.80 | 0.22*b* | 0.67 |
| 17 | ..... | ..... | 0.55 | 0.12 | 1.32 | 2.70 | 0.23*b* | 0.72 |
| 18 | ..... | ..... | 0.59 | 0.16 | 0.86 | 0.72 | 0.20*b* | 0.58 |
| 19 | ..... | ..... | 0.61 | 0.19 | 0.77 | 0.48 | 0.35*b* | 1.33 |
| 20 | 4.00 | 4*a* | 0.62 | 0.20 | 0.11*b* | 0.24 | 0.25*b* | 0.81 |
| 21 | 4.10 | 6 | 0.57 | 0.14 | 0.13*b* | 0.31 | 0.23*b* | 0.72 |
| 22 | 7.20 | 8 | 0.59 | 0.16 | 0.30*b* | 1.06 | 0.20*b* | 0.58 |
| 23 | 6.20 | 7 | 0.61 | 0.19 | 0.40*b* | 1.62 | 0.25*b* | 0.81 |
| 24 | 5.80 | 8 | 0.59 | 0.16 | 1.52 | 4.00 | 0.20*b* | 0.58 |
| 25 | 5.40 | 10 | 0.62 | 0.20 | 0.31*b* | 1.11 | 0.30*b* | 1.06 |
| 26 | 4.10 | 12 | 0.60 | 0.17 | 1.84 | 6.50 | 2.65 | 13.00 |
| 27 | 3.80 | 14 | 0.58 | 0.15 | 0.18*b* | 0.50 | 1.65 | 5.00 |
| 28 | 4.30 | 16 | 0.55 | 0.12 | 0.20*b* | 0.58 | 0.50*b* | 2.24 |
| 29 | 5.00 | 18 | 0.56 | 0.13 | 1.80 | 6.20 | 0.50*b* | 2.24 |
| 30 | 5.50 | 24 | 0.58 | 0.15 | 0.30 | 1.06 | 0.45*b* | 1.92 |
| 31 | 5.15 | 20 | ..... | ..... | 0.40 | 1.62 | ..... | ..... |

*a* to *a* Estimated.
*b* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Mule Creek at Gunn's Ranch, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 0.47*b* | 2.04 | 0.15*b* | 0.38 | 0.49 | 0.06 | 0.75 | 0.44 |
| 2 | 0.45*b* | 1.92 | 0.16*b* | 0.42 | 0.46 | 0.04 | 0.88 | 0.77 |
| 3 | 0.47*b* | 2.05 | 0.12*b* | 0.27 | 0.47 | 0.05 | 0.28*b* | 0.96 |
| 4 | 0.45*b* | 1.92 | 0.10*b* | 0.21 | 0.45 | 0.04 | 0.25*b* | 0.81 |
| 5 | 0.43*b* | 1.80 | 1.50 | 3.90 | 0.46 | 0.04 | 0.35*b* | 1.33 |
| 6 | 0.45*b* | 1.92 | 1.30 | 2.60 | 0.44 | 0.04 | 0.58 | 2.74 |
| 7 | 0.50*b* | 2.24 | 1.40 | 3.20 | 0.80 | 0.55 | 0.48*b* | 2.11 |
| 8 | 0.44*b* | 1.86 | 0.60 | 0.17 | 0.65 | 0.25 | 0.16*b* | 0.42 |
| 9 | 0.38*b* | 1.50 | 0.50 | 0.06 | 0.40 | 0.02 | 0.17*b* | 0.46 |
| 10 | 0.30*b* | 1.06 | 0.45 | 0.04 | 0.50 | 0.06 | 0.19*b* | 0.54 |
| 11 | 0.20*b* | 0.58 | 0.43 | 0.03 | 0.50 | 0.06 | 0.20*b* | 0.58 |
| 12 | 0.15*b* | 0.38 | 0.40 | 0.02 | 0.60 | 0.17 | 0.18*b* | 0.50 |
| 13 | 0.11*b* | 0.24 | 0.44 | 0.04 | 0.95 | 0.99 | 0.17*b* | 0.46 |
| 14 | 0.12*b* | 0.27 | 0.48 | 0.05 | 1.00 | 1.16 | 0.14*b* | 0.34 |
| 15 | 0.15*b* | 0.38 | 0.53 | 0.09 | 1.10 | 1.56 | 0.16*b* | 0.42 |
| 16 | 0.18*b* | 0.50 | 0.50 | 0.06 | 0.99 | 1.13 | 0.18*b* | 0.50 |
| 17 | 0.21*b* | 0.63 | 0.40 | 0.02 | 0.98 | 1.09 | 0.18*b* | 0.50 |
| 18 | 0.28*b* | 0.96 | 0.45 | 0.04 | 0.95 | 0.99 | 0.15*b* | 0.38 |
| 19 | 0.20*b* | 0.58 | 0.48 | 0.05 | 0.70 | 0.33 | 0.64 | 0.23 |
| 20 | 0.30*b* | 1.06 | 0.48 | 0.05 | 0.65 | 0.25 | 0.67 | 0.28 |
| 21 | 0.43*b* | 1.80 | 0.53 | 0.09 | 0.63 | 0.22 | 0.65 | 0.25 |
| 22 | 0.40*b* | 1.62 | 0.58 | 0.15 | 0.60 | 0.17 | 0.69 | 0.31 |
| 23 | 0.20*b* | 0.58 | 0.60 | 0.17 | 0.57 | 0.14 | 0.67 | 0.28 |
| 24 | 1.77 | 6.00 | 0.55 | 0.12 | 0.55 | 0.12 | 0.63 | 0.22 |
| 25 | 0.20*b* | 0.58 | 0.52 | 0.08 | 0.68 | 0.30 | 0.62 | 0.20 |
| 26 | 1.46 | 3.60 | 0.48 | 0.05 | 0.63 | 0.22 | 0.60 | 0.17 |
| 27 | 0.25*b* | 0.81 | 0.44 | 0.04 | 0.60 | 0.17 | 0.63 | 0.22 |
| 28 | 0.15*b* | 0.38 | 0.40 | 0.02 | 0.65 | 0.25 | 0.65 | 0.25 |
| 29 | 0.35*b* | 1.33 | 0.43 | 0.03 | 0.67 | 0.28 | 0.67 | 0.28 |
| 30 | 0.14*b* | 0.34 | 0.46 | 0.04 | 0.75 | 0.44 | 0.62 | 0.20 |
| 31 | 0.12*b* | 0.27 | 0.48 | 0.05 | ..... | ..... | 0.64 | 0.23 |

*b* Weir measurement.

MONTHLY DISCHARGE of Mule Creek at Gunn's Ranch, for 1915.

(Drainage area 60 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (20-31) | 24.00 | 4.00 | 12.20 | 0.203 | 0.09 | 290 |
| April | 60.00 | 0.12 | 9.10 | 0.152 | 0.18 | 541 |
| May | 6.50 | 0.13 | 1.39 | 0.023 | 0.03 | 85 |
| June | 13.00 | 0.24 | 2.00 | 0.033 | 0.04 | 119 |
| July | 6.00 | 0.24 | 1.32 | 0.022 | 0.02 | 81 |
| August | 3.90 | 0.02 | 0.40 | 0.007 | 0.01 | 25 |
| September | 1.56 | 0.02 | 0.37 | 0.006 | 0.01 | 22 |
| October | 2.70 | 0.17 | 0.56 | 0.009 | 0.01 | 34 |
| The period | ..... | ..... | ..... | ..... | 0.39 | 1,197 |

BATE CREEK AT BATE'S RANCH.

*Location.*—On NW. ¼ Sec. 6, Tp. 6, Rge. 16, W. 3rd Mer., near Nummola Post Office.

*Records available.*—April 15 to October 31, 1915.

*Gauge.*—Vertical staff, fastened to a post on right bank about one-quarter mile from Mr. Bate's house. The elevation of the zero maintained 94.87 feet in 1914, and 92.77 feet in 1915.

*Bench-mark.*—Wooden plug driven in the left bank 36 feet from the gauge. Assumed elevation, 100.00 feet.

*Channel.*—Probably permanent.
*Discharge measurements.*—Made with meter and weir.
*Diversions.*—Mr. Bate diverts water for irrigation purposes above the gauge.
*Observer.*—A. E. Bate.

DISCHARGE MEASUREMENTS of Bate Creek at Bate's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 11 | F. R. Steinberger | ..... | ..... | ..... | 1.270 | 0.277*b* |
| May 20 | do | ..... | ..... | ..... | 0.115*a* | 0.255*b* |
| May 26 | do | ..... | ..... | ..... | 0.270*a* | 0.908*b* |
| May 31 | do | ..... | ..... | ..... | 0.135*a* | 0.327*b* |
| June 25 | do | ..... | ..... | ..... | 0.115*a* | 0.255*b* |
| June 26 | do | ..... | ..... | ..... | 0.190*a* | 0.539*b* |
| June 29 | do | ..... | ..... | ..... | 0.120*a* | 0.273*b* |
| July 27 | do | ..... | ..... | ..... | 0.140*a* | 0.344*b* |
| July 28 | do | ..... | ..... | ..... | 0.120*a* | 0.273*b* |
| July 30 | do | ..... | ..... | ..... | 0.120*a* | 0.273*b* |
| Aug. 21 | do | ..... | ..... | ..... | 0.100*a* | 0.209*b* |
| Aug. 23 | do | ..... | ..... | ..... | 0.090*a* | 0.176*b* |
| Aug. 25 | do | ..... | ..... | ..... | 0.120*a* | 0.273*b* |
| Sept. 14 | do | ..... | ..... | ..... | 0.150*a* | 0.381*b* |
| Sept. 16 | do | ..... | ..... | ..... | 0.150*a* | 0.381*b* |
| Oct. 4 | do | ..... | ..... | ..... | 0.140*a* | 0.341*b* |
| Oct. 6 | do | ..... | ..... | ..... | 0.140*a* | 0.341*b* |
| Oct. 7 | do | ..... | ..... | ..... | 0.150*a* | 0.381*b* |

*a* Weir gauge rod.
*b* Weir measurements.

DAILY GAUGE HEIGHT AND DISCHARGE of Bate Creek at Bate's Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft* |
| 1 | ..... | ..... | 1.83 | 1.59 | 1.24 | 0.25 | 0.16 | 0.42 |
| 2 | ..... | ..... | 2.78 | 4.70 | 1.24 | 0.25 | 0.25 | 0.81 |
| 3 | ..... | ..... | 2.40 | 3.40 | 1.24 | 0.25 | 0.18 | 0.50 |
| 4 | ..... | ..... | 1.79 | 1.47 | 1.24 | 0.25 | 0.14 | 0.34 |
| 5 | ..... | ..... | 1.78 | 1.44 | 1.23 | 0.24 | 0.16 | 0.42 |
| 6 | ..... | ..... | 1.58 | 0.89 | 1.23 | 0.24 | 0.14 | 0.34 |
| 7 | ..... | ..... | 1.50 | 0.69 | 1.23 | 0.24 | 0.13 | 0.31 |
| 8 | ..... | ..... | 1.54 | 0.79 | 1.22 | 0.22 | 0.14 | 0.34 |
| 9 | ..... | ..... | 1.54 | 0.79 | 1.22 | 0.22 | 0.12 | 0.27 |
| 10 | ..... | ..... | 1.48 | 0.65 | 1.22 | 0.22 | 0.14 | 0.34 |
| 11 | ..... | ..... | 1.48 | 0.65 | 1.24 | 0.25 | 0.12 | 0.27 |
| 12 | ..... | ..... | 1.45 | 0.58 | 1.25 | 0.26 | 0.11 | 0.24 |
| 13 | ..... | ..... | 1.52 | 0.74 | 1.28 | 0.31 | 0.10 | 0.21 |
| 14 | ..... | ..... | 1.56 | 0.84 | 1.56 | 0.84 | 0.10 | 0.21 |
| 15 | ..... | ..... | 1.38 | 0.45 | 1.43 | 0.54 | 0.11 | 0.24 |
| 16 | ..... | ..... | 1.40 | 0.48 | 1.35 | 0.40 | 0.14 | 0.34 |
| 17 | ..... | ..... | 1.37 | 0.43 | 1.30 | 0.32 | 0.14 | 0.34 |
| 18 | ..... | ..... | 1.31 | 0.34 | 1.28 | 0.31 | 0.11 | 0.24 |
| 19 | ..... | ..... | 1.32 | 0.35 | 1.24 | 0.25 | 0.19 | 0.54 |
| 20 | ..... | ..... | 1.32 | 0.35 | 1.25 | 0.26 | 0.16 | 0.42 |
| 21 | ..... | ..... | 1.28 | 0.30 | 0.12*a* | 0.27 | 0.12 | 0.27 |
| 22 | ..... | ..... | 1.27 | 0.28 | 0.11 | 0.24 | 0.10 | 0.21 |
| 23 | 2.80 | 4.90 | 1.26 | 0.27 | 0.12 | 0.27 | 0.10 | 0.21 |
| 24 | 2.46 | 3.60 | 1.27 | 0.28 | 0.12 | 0.27 | 0.09 | 0.18 |
| 25 | 2.34 | 3.20 | 1.26 | 0.27 | 0.15 | 0.38 | 0.08 | 0.15 |
| 26 | 2.08 | 2.40 | 1.25 | 0.26 | 0.26 | 0.86 | 0.30 | 1.06 |
| 27 | 2.01 | 2.10 | 1.25 | 0.26 | 0.18 | 0.50 | 0.12 | 0.27 |
| 28 | 2.00 | 2.10 | 1.24 | 0.25 | 0.12 | 0.27 | 0.12 | 0.27 |
| 29 | 1.90 | 1.80 | 1.24 | 0.25 | 0.16 | 0.42 | 0.11 | 0.24 |
| 30 | 1.82 | 1.56 | 1.24 | 0.25 | 0.14 | 0.34 | 0.13 | 0.31 |
| 31 | 1.72 | 1.27 | | | 0.12 | 0.27 | | |

*a* New weir gauge rod from May 21.

DAILY GAUGE HEIGHT AND DISCHARGE of Bate Creek at Bate's Ranch, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 0.14 | 0.34 | 0.08 | 0.15 | 0.08 | 0.15 | 0.13 | 0.31 |
| 2 | 0.10 | 0.21 | 0.09 | 0.18 | 0.12 | 0.27 | 0.14 | 0.34 |
| 3 | 0.12 | 0.27 | 0.10 | 0.21 | 0.10 | 0.21 | 0.22 | 0.67 |
| 4 | 0.12 | 0.27 | 0.08 | 0.15 | 0.10 | 0.21 | 0.14 | 0.34 |
| 5 | 0.10 | 0.21 | 0.06 | 0.10 | 0.10 | 0.21 | 0.14 | 0.34 |
| 6 | 0.14 | 0.34 | 0.06 | 0.10 | 0.08 | 0.15 | 0.14 | 0.34 |
| 7 | 0.12 | 0.27 | 0.06 | 0.10 | 0.11 | 0.24 | 0.14 | 0.34 |
| 8 | 0.10 | 0.21 | 0.05 | 0.07 | 0.10 | 0.21 | 0.14 | 0.34 |
| 9 | 0.12 | 0.27 | 0.06 | 0.10 | 0.10 | 0.21 | 0.12 | 0.27 |
| 10 | 0.12 | 0.27 | 0.05 | 0.07 | 0.11 | 0.24 | 0.14 | 0.34 |
| 11 | 0.10 | 0.21 | 0.05 | 0.07 | 0.12 | 0.27 | 0.14 | 0.34 |
| 12 | 0.08 | 0.15 | 0.06 | 0.10 | 0.14 | 0.34 | 0.12 | 0.27 |
| 13 | 0.10 | 0.21 | 0.05 | 0.07 | 0.14 | 0.34 | 0.11 | 0.24 |
| 14 | 0.16 | 0.42 | 0.05 | 0.07 | 0.12 | 0.27 | 0.10 | 0.21 |
| 15 | 0.12 | 0.27 | 0.06 | 0.10 | 0.10 | 0.21 | 0.12 | 0.27 |
| 16 | 0.10 | 0.21 | 0.04 | 0.05 | 0.10 | 0.21 | 0.11 | 0.24 |
| 17 | 0.23 | 0.72 | 0.06 | 0.10 | 0.10 | 0.21 | 0.12 | 0.27 |
| 18 | 0.18 | 0.50 | 0.06 | 0.10 | 0.10 | 0.21 | 0.12 | 0.27 |
| 19 | 0.14 | 0.34 | 0.12 | 0.27 | 0.12 | 0.27 | 0.11 | 0.24 |
| 20 | 0.11 | 0.24 | 0.08 | 0.15 | 0.12 | 0.27 | 0.12 | 0.27 |
| 21 | 0.10 | 0.21 | 0.08 | 0.15 | 0.12 | 0.27 | 0.12 | 0.27 |
| 22 | 0.08 | 0.15 | 0.08 | 0.15 | 0.12 | 0.27 | 0.11 | 0.24 |
| 23 | 0.14 | 0.34 | 0.09 | 0.18 | 0.10 | 0.21 | 0.12 | 0.27 |
| 24 | 0.12 | 0.27 | 0.07 | 0.12 | 0.11 | 0.24 | 0.11 | 0.24 |
| 25 | 0.11 | 0.24 | 0.08 | 0.15 | 0.10 | 0.21 | 0.12 | 0.27 |
| 26 | 0.12 | 0.27 | 0.07 | 0.12 | 0.10 | 0.21 | 0.11 | 0.24 |
| 27 | 0.10 | 0.21 | 0.08 | 0.15 | 0.12 | 0.27 | 0.11 | 0.24 |
| 28 | 0.10 | 0.21 | 0.08 | 0.15 | 0.12 | 0.27 | 0.10 | 0.21 |
| 29 | 0.16 | 0.42 | 0.06 | 0.10 | 0.12 | 0.27 | 0.12 | 0.27 |
| 30 | 0.10 | 0.21 | 0.08 | 0.15 | 0.12 | 0.27 | 0.11 | 0.24 |
| 31 | 0.10 | 0.21 | 0.08 | 0.15 | ..... | ..... | 0.12 | 0.27 |

MONTHLY DISCHARGE of Bate Creek at Bate's Ranch, for 1915.

(Drainage area 12 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (23-31) | 4.90 | 1.27 | 2.55 | 0.212 | 0.07 | 46 |
| April | 4.70 | 0.25 | 0.81 | 0.068 | 0.08 | 48 |
| May | 0.86 | 0.22 | 0.33 | 0.028 | 0.03 | 20 |
| June | 1.06 | 0.15 | 0.34 | 0.029 | 0.03 | 20 |
| July | 0.72 | 0.15 | 0.28 | 0.023 | 0.03 | 17 |
| August | 0.27 | 0.05 | 0.12 | 0.010 | 0.01 | 7 |
| September | 0.34 | 0.15 | 0.24 | 0.020 | 0.02 | 14 |
| October | 0.67 | 0.21 | 0.29 | 0.024 | 0.03 | 18 |
| The period | ..... | ..... | ..... | ..... | 0.30 | 190 |

## FRENCHMAN RIVER AT "76" RANCH.

*Location.*—On the SE. ¼ of Sec. 27, Tp. 5, Rge. 16, W. 3rd Mer., at the "76" ranch near Waldville Post Office.

*Records available.*—April 10, 1914, to October 11, 1915.

*Gauge.*—Vertical staff. Zero elevation has been maintained at 87.95 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Probably permanent.

*Discharge Measurements.*—Made by wading or from cable.

*Winter flow.*—Station not maintained during winter.

*Diversions.*—Messrs. Morrison Brothers, Duncan and Watson, divert water from the stream some fifty miles above the station.

*Observer.*—S. D. Lowry.

DISCHARGE MEASUREMENTS of Frenchman River at "76" Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 10 | F. R. Steinberger | 28 | 22.8 | 1.06 | 2.10 | 24 |
| May 19 | do | 39 | 38.2 | 1.05 | 2.45 | 59 |
| May 21 | do | 64 | 63.0 | 1.24 | 2.55 | 78 |
| May 25 | do | 45 | 39.6 | 1.02 | 2.28 | 40 |
| June 1 | do | 39 | 34.8 | 1.66 | 2.42 | 58 |
| June 23 | do | 62 | 55.8 | 1.32 | 2.54 | 74 |
| June 24 | do | 68 | 84.6 | 1.53 | 2.82 | 129 |
| June 28 | do | 38 | 32.3 | 1.59 | 2.37 | 51 |
| July 3 | do | 38 | 33.9 | 1.52 | 2.37 | 52 |
| July 26 | do | 40 | 40.8 | 1.60 | 2.48 | 65 |
| July 29 | do | 39 | 37.0 | 1.46 | 2.39 | 54 |
| Aug. 20 | do | 35 | 20.5 | 1.07 | 2.08 | 23 |
| Aug. 26 | do | 36 | 21.6 | 1.15 | 2.13 | 28 |
| Sept. 17 | do | 33 | 26.4 | 1.18 | 2.17 | 31 |
| Sept. 30 | do | 32 | 24.4 | 0.87 | 2.11 | 21 |
| Oct. 3 | do | 35 | 25.6 | 1.23 | 2.21 | 31 |
| Oct. 9 | do | 33 | 25.2 | 1.20 | 2.19 | 30 |

DAILY GAUGE HEIGHT AND DISCHARGE of Frenchman River at "76" Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | | | 2.24 | 34 | 2.67 | 98 | 2.41 | 55 |
| 2 | | | 3.85 | 392 | 2.61 | 87 | 2.40 | 53 |
| 3 | | | 4.08 | 455 | 2.47 | 64 | 2.70 | 104 |
| 4 | | | 3.45 | 284 | 2.49 | 66 | 2.50 | 68 |
| 5 | | | 7.72 | 1.437 | 2.48 | 65 | 2.70 | 104 |
| 6 | | | 7.37 | 1.343 | 2.42 | 56 | 3.80 | 379 |
| 7 | | | 8.98 | 1.778 | 2.27 | 37 | 3.70 | 352 |
| 8 | | | 5.37 | 803 | 2.09 | 22 | 3.18 | 213 |
| 9 | | | 4.71 | 625 | 2.10 | 22 | 2.90 | 147 |
| 10 | | | 3.65 | 339 | 2.10 | 22 | 2.70 | 104 |
| 11 | | | 3.42 | 276 | 2.09 | 22 | 2.50 | 68 |
| 12 | | | 3.42 | 276 | *b* | | 2.60 | 85 |
| 13 | | | 3.29*a* | 241 | | | 2.50 | 68 |
| 14 | | | 3.15 | 206 | | | 2.40 | 53 |
| 15 | | | 3.10 | 194 | | | 2.30 | 40 |
| 16 | | | 2.95 | 158 | | | 2.20 | 31 |
| 17 | | | 2.83 | 132 | | | 2.18 | 28 |
| 18 | | | 2.80 | 125 | 2.35 | 46 | 2.18 | 28 |
| 19 | | | 2.75 | 114 | 2.44 | 59 | 2.20 | 41 |
| 20 | | | 2.85 | 136 | 2.40 | 62 | 2.29 | 39 |
| 21 | | | 2.86 | 138 | 2.54 | 75 | 2.26 | 36 |
| 22 | | | 2.73 | 110 | 2.48*a* | 65 | 2.44 | 45 |
| 23 | | | 2.70 | 104 | 2.42*a* | 56 | 2.40 | 53 |
| 24 | 2.00 | 17.2 | 2.65 | 95 | 2.34 | 45 | 2.82 | 129 |
| 25 | 2.05 | 19.8 | 2.60 | 85 | 2.28 | 38 | 2.70 | 104 |
| 26 | 2.26 | 36.0 | 2.50 | 68 | 2.34 | 45 | 2.72 | 108 |
| 27 | 1.90 | 12.5 | 2.45 | 46 | 2.41 | 41 | 2.58 | 73 |
| 28 | 2.15 | 26.0 | 2.49 | 66 | 2.32*a* | 43 | 2.50 | 68 |
| 29 | 2.37 | 49.0 | 2.48 | 65 | 2.30*a* | 44 | 2.44 | 45 |
| 30 | 2.29 | 39.0 | 2.47 | 64 | 2.34 | 48 | 2.46 | 48 |
| 31 | 2.19 | 29.0 | | | 2.29 | 49 | | |

*a* Interpolated.
*b* to *c* Gauge heights not available.

DAILY GAUGE HEIGHT AND DISCHARGE of Frenchman River at "76" Ranch, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.31 | 41 | 2.40 | 53 | ....*b*... | ..... | 2.09 | 22 |
| 2 | 2.30 | 40 | 2.38 | 50 | ..... | ..... | 2.10 | 22 |
| 3 | 2.29 | 39 | 2.40 | 53 | ..... | ..... | 2.20 | 30 |
| 4 | 2.30 | 40 | 2.42 | 56 | ..... | ..... | 2.20 | 30 |
| 5 | 2.30 | 40 | 2.19 | 29 | ..... | ..... | 2.20*a* | 30 |
| 6 | 2.20 | 30 | 2.14 | 26 | ..... | ..... | 2.20 | 30 |
| 7 | 2.29 | 39 | 2.10 | 22 | ..... | ..... | 2.19 | 29 |
| 8 | 2.30 | 40 | 2.23 | 33 | ..... | ..... | 2.19 | 29 |
| 9 | 2.30 | 40 | 2.21 | 31 | ..... | ..... | 2.19 | 29 |
| 10 | 2.39 | 52 | 2.20 | 30 | ....*c*... | ..... | 2.20 | 30 |
| 11 | 2.60 | 85 | 2.18 | 28 | 2.09 | 22 | 2.20 | 30 |
| 12 | 2.50 | 68 | 2.12 | 24 | 2.12 | 24 | ..... | ..... |
| 13 | 2.53 | 73 | 2.08 | 21 | 2.10 | 22 | ..... | ..... |
| 14 | 2.70 | 104 | 2.06 | 20 | 2.12*a* | 24 | ..... | ..... |
| 15 | 2.70 | 104 | 2.05 | 20 | 2.14*a* | 26 | ..... | ..... |
| 16 | 2.57 | 80 | 2.05 | 20 | 2.15 | 26 | ..... | ..... |
| 17 | 2.70 | 104 | 2.05 | 20 | 2.17 | 28 | ..... | ..... |
| 18 | 2.50 | 68 | 2.06 | 20 | 2.17 | 28 | ..... | ..... |
| 19 | 2.53 | 73 | 2.11 | 23 | *b* | ..... | ..... | ..... |
| 20 | 2.50 | 68 | 2.12 | 24 | ..... | ..... | ..... | ..... |
| 21 | 2.56 | 78 | 2.09 | 22 | ..... | ..... | ..... | ..... |
| 22 | 2.67 | 98 | 2.07 | 21 | ..... | ..... | ..... | ..... |
| 23 | 2.66 | 96 | 2.09 | 22 | ..... | ..... | ..... | ..... |
| 24 | 2.56 | 78 | 2.09 | 22 | ..... | ..... | ..... | ..... |
| 25 | 2.50 | 68 | 2.09 | 22 | ..... | ..... | ..... | ..... |
| 26 | 2.46 | 62 | 2.13 | 25 | ..... | ..... | ..... | ..... |
| 27 | 2.50 | 68 | 2.13 | 25 | ..... | ..... | ..... | ..... |
| 28 | 2.42 | 56 | 2.13 | 25 | ..... | ..... | ..... | ..... |
| 29 | 2.43 | 58 | 2.12*a* | 24 | .....*c* | ..... | ..... | ..... |
| 30 | 2.38 | 50 | 2.12*a* | 24 | 2.11 | 23 | ..... | ..... |
| 31 | 2.42 | 56 | 2.12*a* | 24 | ..... | ..... | ..... | ..... |

*a* Interpolated.
*b* to *c* Gauge heights not available.

MONTHLY DISCHARGE of Frenchman River at "76" Ranch, for 1915.

(Drainage area 1,106 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (24-31) | 49 | 12.5 | 28 | 0.025 | 0.01 | 444 |
| April | 1,437 | 34.0 | 340 | 0.307 | 0.34 | 20,231 |
| May (1-11 and 18-31) | 98 | 22.0 | 51 | 0.046 | 0.04 | 2,529 |
| June | 379 | 28.0 | 92 | 0.083 | 0.09 | 5,474 |
| July | 104 | 30.0 | 64 | 0.058 | 0.07 | 3,935 |
| August | 56 | 20.0 | 28 | 0.025 | 0.03 | 1,722 |
| September (11-18 and 30) | 28 | 22.0 | 25 | 0.023 | 0.01 | 446 |
| October (1-11) | 30 | 22.0 | 28 | 0.025 | 0.01 | 611 |
| The period | ..... | ..... | ..... | ..... | 0.30 | 35,392 |

SNAKE CREEK NEAR VAL MARIE.

*Location.*—On SW. ¼ of Sec. 16, Tp. 4, Rge. 13, W. 3rd Mer., about one-half mile east of Val Marie Post Office.

*Records available.*—April 7, 1914, to October 31, 1915.

*Gauge.*—Vertical staff. Zero elevation has been maintained at 87.91 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark, located three feet north of the east tower of the cable. Assumed elevation, 100.00 feet.

*Channel.*—Permanent.

*Discharge measurements.*—Made from cable and by weir.

*Observer.*—Jean Denniel.

DISCHARGE MEASUREMENTS of Snake Creek near Val Marie, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 7 | F. R. Steinberger | ..... | ..... | ..... | 0.59 | 0.39a |
| May 22 | do | ..... | ..... | ..... | 0.60 | 0.39a |
| June 4 | do | 2.6 | 1.04 | 1.13 | 0.89 | 1.18 |
| June 21 | do | ..... | ..... | ..... | 0.70 | 0.50a |
| July 7 | do | ..... | ..... | ..... | 0.60 | 0.35a |
| July 24 | do | ..... | ..... | ..... | 0.50 | 0.28a |
| Aug. 2 | do | ..... | ..... | ..... | 0.60 | 0.36a |
| Aug. 17 | do | ..... | ..... | ..... | 0.45 | 0.09a |
| Aug. 28 | do | ..... | ..... | ..... | 0.42 | 0.05a |
| Sept. 10 | do | ..... | ..... | ..... | 0.53 | 0.28a |
| Sept. 19 | do | ..... | ..... | ..... | 0.65 | 0.25a |
| Sept. 29 | do | ..... | ..... | ..... | 0.64 | 0.28a |
| Oct. 12 | do | ..... | ..... | ..... | 0.64 | 0.30a |

*a* Weir measurements.

DAILY GAUGE HEIGHT AND DISCHARGE of Snake Creek near Val Marie, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 4.37 | 14.00 | 0.57 | 0.24 | 0.92 | 1.32 |
| 2 | ..... | ..... | 5.89 | 22.00a | 0.57 | 0.24 | 0.90 | 1.23 |
| 3 | ..... | ..... | 6.87 | 28.00 | 0.57 | 0.24 | 0.89 | 1.19 |
| 4 | ..... | ..... | 5.39 | 21.00 | 0.58 | 0.26 | 0.88 | 1.14 |
| 5 | ..... | ..... | 4.11 | 15.70 | 0.59 | 0.28 | 0.81 | 0.84 |
| 6 | ..... | ..... | 3.50 | 12.90 | 0.60 | 0.29 | 0.69 | 0.48 |
| 7 | ..... | ..... | 3.09 | 11.10 | 0.59 | 0.28 | 0.65 | 0.39 |
| 8 | ..... | ..... | 2.57 | 8.70 | 0.59 | 0.28 | 0.67 | 0.44 |
| 9 | ..... | ..... | 2.12 | 6.70 | 0.58 | 0.26 | 0.65 | 0.39 |
| 10 | ..... | ..... | 1.79 | 5.20 | 0.58 | 0.26 | 0.63 | 0.35 |
| 11 | ..... | ..... | 1.52 | 4.00 | 0.58 | 0.26 | 0.60 | 0.29 |
| 12 | ..... | ..... | 1.32 | 3.10 | 0.58 | 0.26 | 0.59 | 0.28 |
| 13 | ..... | ..... | 1.11 | 2.20 | 0.59 | 0.28 | 0.59 | 0.28 |
| 14 | ..... | ..... | 1.01 | 1.72 | 0.62 | 0.33 | 0.63 | 0.35 |
| 15 | ..... | ..... | 0.99 | 1.64 | 0.65 | 0.39 | 0.60 | 0.29 |
| 16 | ..... | ..... | 0.87 | 1.10 | 0.69 | 0.48 | 0.57 | 0.24 |
| 17 | ..... | ..... | 0.85 | 1.01 | 0.67 | 0.44 | 0.65 | 0.39 |
| 18 | ..... | ..... | 0.82 | 0.89 | 0.66 | 0.42 | 0.61 | 0.31 |
| 19 | ..... | ..... | 0.79 | 0.77 | 0.62 | 0.33 | 0.62 | 0.33 |
| 20 | ..... | ..... | 0.72 | 0.56 | 0.59 | 0.28 | 0.65 | 0.39 |
| 21 | ..... | ..... | 0.72 | 0.56 | 0.57 | 0.24 | 0.71 | 0.53 |
| 22 | 1.37 | 3a | 0.71 | 0.53 | 0.59 | 0.28 | 0.72 | 0.56 |
| 23 | 1.42 | 3 | 0.72 | 0.56 | 0.57 | 0.24 | 0.75 | 0.65 |
| 24 | 3.52 | 8 | 0.72 | 0.56 | 0.55 | 0.22 | 0.76 | 0.68 |
| 25 | 3.69 | 10 | 0.69 | 0.48 | 0.54 | 0.20 | 0.70 | 0.50 |
| 26 | 3.37 | 9 | 0.67 | 0.44 | 0.69 | 0.48 | 0.67 | 0.44 |
| 27 | 3.33 | 9 | 0.65 | 0.39 | 0.75 | 0.65 | 0.68 | 0.46 |
| 28 | 3.37 | 9 | 0.63 | 0.35 | 0.75 | 0.65 | 0.69 | 0.48 |
| 29 | 2.92 | 8 | 0.61 | 0.31 | 0.70 | 0.50 | 0.68 | 0.46 |
| 30 | 3.27 | 10 | 0.61 | 0.31 | 0.96 | 1.50 | 0.68 | 0.46 |
| 31 | 4.27 | 12 | | | 0.95 | 1.45 | | |

*a* to *a* Estimated

DAILY GAUGE HEIGHT AND DISCHARGE of Snake Creek near Val Marie, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 0.64 | 0.37 | 0.57 | 0.24 | 0.44 | 0.08 | 0.65 | 0.39 |
| 2 | 0.65 | 0.39 | 0.56 | 0.23 | 0.45 | 0.09 | 0.66 | 0.42 |
| 3 | 0.65 | 0.39 | 0.57 | 0.24 | 0.45 | 0.09 | 0.75 | 0.65 |
| 4 | 0.66 | 0.42 | 0.57 | 0.24 | 0.45 | 0.09 | 0.74 | 0.62 |
| 5 | 0.63 | 0.35 | 0.55 | 0.22 | 0.45 | 0.09 | 0.73 | 0.59 |
| 6 | 0.61 | 0.31 | 0.53 | 0.18 | 0.45 | 0.09 | 0.70 | 0.50 |
| 7 | 0.60 | 0.29 | 0.51 | 0.16 | 0.47 | 0.11 | 0.68 | 0.46 |
| 8 | 0.64 | 0.37 | 0.52 | 0.17 | 0.51 | 0.16 | 0.65 | 0.39 |
| 9 | 0.62 | 0.33 | 0.51 | 0.16 | 0.52 | 0.17 | 0.65 | 0.39 |
| 10 | 0.61 | 0.31 | 0.50 | 0.14 | 0.53 | 0.18 | 0.64 | 0.37 |
| 11 | 0.60 | 0.29 | 0.48 | 0.12 | 0.56 | 0.23 | 0.64 | 0.37 |
| 12 | 0.59 | 0.28 | 0.46 | 0.10 | 0.59 | 0.28 | 0.64 | 0.37 |
| 13 | 0.57 | 0.24 | 0.47 | 0.11 | 0.63 | 0.35 | 0.63 | 0.35 |
| 14 | 0.55 | 0.22 | 0.46 | 0.10 | 0.66 | 0.42 | 0.63 | 0.35 |
| 15 | 0.58 | 0.26 | 0.46 | 0.10 | 0.65 | 0.39 | 0.62 | 0.33 |
| 16 | 0.60 | 0.29 | 0.46 | 0.10 | 0.64 | 0.37 | 0.62 | 0.33 |
| 17 | 0.62 | 0.33 | 0.45 | 0.09 | 0.65 | 0.39 | 0.63 | 0.35 |
| 18 | 0.79 | 0.77 | 0.46 | 0.10 | 0.65 | 0.39 | 0.63 | 0.35 |
| 19 | 0.79 | 0.77 | 0.47 | 0.11 | 0.65 | 0.39 | 0.64 | 0.37 |
| 20 | 0.76 | 0.68 | 0.48 | 0.12 | 0.64 | 0.37 | 0.63 | 0.35 |
| 21 | 0.73 | 0.59 | 0.47 | 0.11 | 0.62 | 0.33 | 0.64 | 0.37 |
| 22 | 0.69 | 0.48 | 0.47 | 0.11 | 0.61 | 0.31 | 0.62 | 0.33 |
| 23 | 0.64 | 0.37 | 0.46 | 0.10 | 0.61 | 0.31 | 0.60 | 0.29 |
| 24 | 0.63 | 0.35 | 0.46 | 0.10 | 0.60 | 0.29 | 0.60 | 0.29 |
| 25 | 0.63 | 0.35 | 0.45 | 0.09 | 0.59 | 0.28 | 0.59 | 0.28 |
| 26 | 0.61 | 0.31 | 0.45 | 0.09 | 0.59 | 0.28 | 0.58 | 0.26 |
| 27 | 0.60 | 0.29 | 0.45 | 0.09 | 0.60 | 0.29 | 0.58 | 0.26 |
| 28 | 0.58 | 0.26 | 0.44 | 0.08 | 0.64 | 0.37 | 0.57 | 0.24 |
| 29 | 0.58 | 0.26 | 0.44 | 0.08 | 0.65 | 0.39 | 0.56 | 0.23 |
| 30 | 0.59 | 0.28 | 0.44 | 0.08 | 0.65 | 0.39 | 0.57 | 0.24 |
| 31 | 0.57 | 0.24 | 0.44 | 0.08 | ..... | ..... | 0.59 | 0.28 |

MONTHLY DISCHARGE of Snake Creek near Val Marie, for 1915.

(Drainage area 188 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (22-31) | 12.00 | 3.00 | 8.10 | 0.0430 | 0.016 | 161 |
| April | 28.00 | 0.31 | 5.60 | 0.0300 | 0.034 | 333 |
| May | 1.50 | 0.20 | 0.40 | 0.0020 | 0.002 | 25 |
| June | 1.32 | 0.24 | 0.54 | 0.0030 | 0.003 | 32 |
| July | 0.77 | 0.22 | 0.37 | 0.0020 | 0.002 | 23 |
| August | 0.24 | 0.08 | 0.13 | 0.0007 | 0.001 | 8 |
| September | 0.42 | 0.08 | 0.27 | 0.0014 | 0.002 | 16 |
| October | 0.65 | 0.23 | 0.37 | 0.0020 | 0.002 | 23 |
| The period | ..... | ..... | ..... | ..... | 0.062 | 621 |

BIGBREED CREEK AT BUZZARD'S RANCH.

*Location.*—On the NW. ¼ Sec. 3, Tp. 2, Rge. 11, W. 3rd Mer., about 300 feet from the junction with the Frenchman River. Previous to April 20, 1915, located on SE. ¼ Sec. 15, Tp. 2, Rge. 11, W. 3rd Mer.

*Records available.*—March 23, 1914, to October 31, 1915.

*Gauge.*—Vertical staff. Zero elevation maintained at 95.42 feet since April 20, 1915. At old station maintained at 92.13 feet.

*Bench-marks.*—Wooden plug, eight feet northeast of rod. Assumed elevation, 100.00 feet; Supplementary bench-mark on I. P. stake. Elevation, 104.47 feet. Permanent iron bench-mark. Assumed elevation, 100.00 feet used at old station.

*Channel.*—Slightly shifting, and may be affected by high stages on Frenchman River.

*Discharge measurements.*—Made with water or weir.

*Gauge heights.*—No records were available after June 2, 1915.

*Winter flow.*—Station not maintained during winter.

*Observer.*—C. T. McNamara.

DISCHARGE MEASUREMENTS of Bigbreed Creek at Buzzard's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 23 | F. R. Steinberger | 5.0 | 1.10 | 0.60 | 0.97 | 0.670 |
| Mar. 25 | do | 31.0 | 55.35 | 1.15 | 3.37 | 63.000 |
| Mar. 26 | do | 28.4 | 44.32 | 1.10 | 3.07 | 48.000 |
| Mar. 29 | do | 18.3 | 17.44 | 1.70 | 2.23 | 30.000 |
| Mar. 30 | do | 18.0 | 16.40 | 1.60 | 2.12 | 26.000 |
| Mar. 31 | do | 14.0 | 13.90 | 1.70 | 1.91 | 24.000 |
| April 1 | do | 14.0 | 14.80 | 1.20 | 2.05 | 28.000 |
| April 2 | do | 26.0 | 41.45 | 1.70 | 3.42 | 74.000 |
| April 5 | do | 22.0 | 26.00 | 1.84 | 2.62 | 48.000 |
| April 6 | do | 18.0 | 17.40 | 1.79 | 2.12 | 31.000 |
| April 7 | do | 16.0 | 13.20 | 1.30 | 1.83 | 18.000 |
| April 8 | do | 13.5 | 8.95 | 0.97 | 1.63 | 8.800 |
| April 9 | do | 11.5 | 6.68 | 1.09 | 1.49 | 7.400 |
| April 10 | do | 9.0 | 6.63 | 0.74 | 1.63 | 5.000 |
| April 12 | do | 6.3 | 5.15 | 0.49 | 1.32 | 2.600 |
| April 20 | do | ..... | ..... | ..... | 1.01 | 0.431*a* |
| April 28 | do | ..... | ..... | ..... | 0.67 | 0.074*a* |
| June 7 | do | 4.6 | 4.47 | 1.30 | 1.71 | 5.700 |
| June 8 | do | 4.2 | 3.92 | 1.00 | 1.55 | 3.900 |
| June 16 | do | ..... | ..... | ..... | 0.93 | 0.459*a* |
| July 10 | do | ..... | ..... | ..... | 0.00 | Nil. |
| July 21 | do | ..... | ..... | ..... | 0.70 | 0.146*a* |
| Aug. 4 | do | ..... | ..... | ..... | Dry. | Nil. |
| Aug. 13 | do | ..... | ..... | ..... | " | " |
| Aug. 31 | do | ..... | ..... | ..... | " | " |
| Sept. 8 | do | ..... | ..... | ..... | " | " |
| Sept. 21 | do | ..... | ..... | ..... | " | " |
| Oct. 14 | do | ..... | ..... | ..... | " | " |

*a* Weir measurements.

DAILY GAUGE HEIGHT AND DISCHARGE of Bigbreed Creek at Buzzard's Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.00 | 27.00 | 0.70 | 0.07 | 1.50 | 3.40 |
| 2 | ..... | ..... | 3.40 | 73.00 | 0.65 | 0.04 | 1.50*d* | 3.40 |
| 3 | ..... | ..... | 5.09 | 130.00 | 0.60 | Nil. | 1.53 | 3.70 |
| 4 | ..... | ..... | 4.49 | 110.00 | 0.60 | " | 1.56 | 4.00 |
| 5 | ..... | ..... | 2.62 | 47.00 | 0.60 | " | 1.60 | 4.30 |
| 6 | ..... | ..... | 2.12 | 31.00 | 0.65 | 0.04 | 1.63 | 4.60 |
| 7 | ..... | ..... | 1.79 | 18.00*k* | 0.60 | Nil. | 1.67*e* | 5.00 |
| 8 | ..... | ..... | 1.69 | 8.80 | 0.50 | " | 1.71 | 5.40 |
| 9 | ..... | ..... | 1.69*d* | 7.40 | Dry. | " | 1.62*d* | 4.50 |
| 10 | ..... | ..... | 1.64 | 5.00*l* | " | " | 1.52 | 3.60 |
| 11 | ..... | ..... | 1.59 | 4.20 | " | " | 1.42 | 2.80 |
| 12 | ..... | ..... | 1.54*e* | 3.80 | " | " | 1.32 | 2.10 |
| 13 | ..... | ..... | 1.49 | 3.40 | " | " | 1.22 | 1.42 |
| 14 | ..... | ..... | 1.39 | 2.60 | 0.70 | 0.07 | 1.12 | 0.94 |
| 15 | ..... | ..... | 1.29 | 1.84 | 1.00 | 0.50 | 1.02*e* | 0.57 |
| 16 | ..... | ..... | 1.39 | 2.60 | 1.90 | 7.30 | 0.92 | 0.34*x* |
| 17 | ..... | ..... | 1.39 | 2.60 | 2.10 | 9.30 | ..... | ..... |
| 18 | ..... | ..... | 1.49 | 3.40 | 2.00 | 8.30 | ..... | ..... |
| 19 | ..... | ..... | 1.49 | 3.40 | 1.70 | 5.30 | ..... | ..... |
| 20 | ..... | ..... | 1.49 | 3.40 | 1.00 | 0.50 | ..... | ..... |
| 21 | ..... | ..... | 1.86*a* | 6.90 | 0.90 | 0.30 | ..... | ..... |
| 22 | ..... | ..... | 0.96 | 0.42 | 0.80 | 0.15 | ..... | ..... |
| 23 | 0.97 | 0.67*f* | 0.96 | 0.42 | 0.60 | 0.00 | ..... | ..... |
| 24 | 3.42 | 32.00*n* | 0.76 | 0.12 | Dry. | Nil. | ..... | ..... |
| 25 | 3.36 | 63.00 | 0.76 | 0.12 | " | " | ..... | ..... |
| 26 | 3.11 | 48.00 | 0.76 | 0.12 | " | " | ..... | ..... |
| 27 | 2.91 | 42.00*n* | 0.67 | 0.05 | " | " | ..... | ..... |
| 28 | 2.21 | 36.00*n* | 0.67 | 0.05 | " | " | ..... | ..... |
| 29 | 2.31 | 30.00 | 0.70 | 0.07 | " | " | ..... | ..... |
| 30 | 2.10 | 26.00*h* | 0.70 | 0.07 | " | " | ..... | ..... |
| 31 | 1.90 | 23.80 | ..... | ..... | " | " | ..... | ..... |

*a* Gauge rod at new station.
*d* to *e* Gauge heights interpolated.
*f* to *h* Ice conditions.
*k* to *l* Shifting conditions.
*n* Discharge interpolated.
*x* No observations after June 16.

MONTHLY DISCHARGE of Bigbreed Creek at Buzzard's Ranch, for 1915.

(Drainage area 83 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (23-31) | 63.00 | 0.67 | 33.00 | 0.398 | 0.133 | 589 |
| April | 130.00 | 0.05 | 16.60 | 0.200 | 0.223 | 988 |
| May | 9.30 | 0.00 | 1.03 | 0.012 | 0.014 | 63 |
| June | 5.40 | 0.00 | 1.67 | 0.020 | 0.022 | 99 |
| The period | ..... | ..... | ..... | ..... | 0.400 | 1,774 |

FRENCHMAN RIVER AT BUZZARD'S RANCH.

*Location.*—On the NW. ¼ Sec. 3, Tp. 2, Rge. 11, W. 3rd Mer., at Wm. Buzzard's ranch near Corriander Post Office, and below the mouth of Bigbreed Creek.

*Records available.*—March 27, 1914, to October 25, 1915.

*Gauge.*—Vertical staff fastened to post on left bank, about one-half mile upstream from Mr. Buzzard's house. Zero elevation of gauge maintained at 87.50 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark located two feet west of the sill of the north tower of the cable. Assumed elevation, 100.00 feet.

*Channel.*—Probably permanent.

*Discharge measurements.*—Made by wading or from cable.

*Winter flow.*—Station not maintained during winter.

*Observer.*—C. T. MacNamara.

DISCHARGE MEASUREMENTS of Frenchman River at Buzzard's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar 20 | F. R. Steinberger | 7.2 | 3.03 | 1.28 | 0.56 | 3.9 |
| Mar. 22 | do | 9.2 | 4.02 | 1.52 | 0.71 | 6.2 |
| Mar. 23 | do | 31.5 | 31.13 | 2.03 | 1.31 | 84.0 |
| Mar. 24 | do | 52.0 | 146.10 | 1.40 | 3.81 | 204.0 |
| Mar. 25 | do | 52.0 | 147.60 | 1.34 | 3.71 | 198.0 |
| Mar. 26 | do | 57.0 | 270.00 | 1.50 | 5.89 | 406.0 |
| Mar. 29 | do | 54.0 | 207.60 | 1.65 | 4.74 | 341.0 |
| Mar. 30 | do | 54.0 | 204.60 | 1.78 | 4.75 | 364.0 |
| Mar. 31 | do | 55.0 | 233.80 | 1.90 | 5.41 | 442.0 |
| April 1 | do | 57.0 | 247.10 | 2.03 | 5.76 | 502.0 |
| April 3 | do | 70.0 | 355.00 | 2.59 | 7.50 | 920.0 |
| April 5 | do | 83.0 | 508.40 | 2.20 | 9.53 | 1122.0 |
| April 6 | do | 74.0 | 423.00 | 2.08 | 8.34 | 923.0 |
| April 7 | do | 81.0 | 471.40 | 2.10 | 9.08 | 1092.0 |
| April 8 | do | 90.0 | 572.50 | 2.26 | 10.24 | 1287.0 |
| April 9 | do | 101.0 | 646.00 | 2.24 | 11.04 | 1444.0 |
| April 10 | do | 107.0 | 716.60 | 2.20 | 11.70 | 1578.0 |
| April 12 | do | 53.0 | 150.10 | 3.18 | 3.59 | 478.0 |
| April 20 | do | 44.0 | 49.60 | 3.08 | 1.38 | 149.0 |
| April 28 | do | 42.0 | 35.00 | 2.16 | 0.95 | 79.0 |
| April 30 | do | 42.0 | 30.40 | 1.87 | 0.83 | 58.0 |
| June 7 | do | 42.0 | 41.70 | 2.58 | 1.04 | 107.0 |
| June 15 | do | 41.0 | 33.20 | 2.02 | 0.88 | 67.0 |
| July 10 | do | 43.0 | 40.65 | 1.22 | 0.76 | 49.0 |
| July 21 | do | 43.0 | 41.30 | 2.51 | 1.00 | 104.0 |
| Aug. 4 | do | 43.0 | 33.00 | 1.70 | 0.79 | 57.0 |
| Aug. 13 | do | 34.0 | 35.50 | 0.87 | 0.69 | 31.0 |
| Aug. 31 | do | 31.0 | 31.55 | 0.67 | 0.60 | 21.0 |
| Sept. 8 | do | 31.0 | 24.20 | 0.74 | 0.55 | 17.8 |
| Sept. 21 | do | 29.0 | 20.85 | 1.25 | 0.65 | 26.0 |
| Oct. 14 | do | 31.0 | 20.55 | 1.34 | 0.66 | 27.0 |
| Oct. 25 | do | 31.0 | 20.30 | 1.29 | 0.65 | 26.0 |

DAILY GAUGE HEIGHT AND DISCHARGE of Frenchman River at Buzzard's Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 5.80 | 502 | 0.78 | 50 | 0.77 | 49 |
| 2 | ..... | ..... | 5.86 | 590 | 0.84 | 59 | 0.97 | 79 |
| 3 | ..... | ..... | 7.55 | 920 | 0.88 | 65 | 0.87*a* | 64 |
| 4 | ..... | ..... | 9.20 | 1,000 | 0.88 | 65 | 0.84*a* | 59 |
| 5 | ..... | ..... | 10.33 | 1,122 | 0.90 | 69 | 0.91*a* | 70 |
| 6 | ..... | ..... | 8.34 | 923 | 0.93 | 73 | 0.98*a* | 81 |
| 7 | ..... | ..... | 9.25 | 1,092 | 0.83 | 57 | 1.04 | 107 |
| 8 | ..... | ..... | 10.15 | 1,287 | 0.78 | 50 | 1.02*a* | 87 |
| 9 | ..... | ..... | 11.04 | 1,444 | 0.78 | 50 | 1.00*a* | 84 |
| 10 | ..... | ..... | 11.70 | 1,578 | 0.69 | 37 | 0.98*a* | 81 |
| 11 | ..... | ..... | 7.24 | 738 | 0.73 | 42 | 0.96*a* | 78 |
| 12 | ..... | ..... | 3.59 | 478 | 0.68 | 34 | 0.94*a* | 75 |
| 13 | ..... | ..... | 4.40 | 601 | 0.68 | 34 | 0.92*a* | 71 |
| 14 | ..... | ..... | 3.20 | 418 | 0.83 | 58 | 0.90*a* | 69 |
| 15 | ..... | ..... | 3.00 | 388 | 0.98 | 81 | 0.88 | 67 |
| 16 | ..... | ..... | 1.80 | 205 | 0.78 | 50 | 0.78*a* | 50 |
| 17 | ..... | ..... | 1.60 | 175 | 0.88 | 65 | 0.68*a* | 35 |
| 18 | ..... | ..... | 1.50 | 160 | 0.89 | 67 | 0.58*a* | 19 |
| 19 | ..... | ..... | 1.50 | 160 | 0.78 | 50 | 0.49*a* | 9 |
| 20 | 0.56 | 3.9 | 1.48 | 149 | 0.98 | 80 | 0.40 | 3 |
| 21 | 0.64 | 5.0 | 1.38 | 141 | 0.88 | 65 | 1.70 | 190 |
| 22 | 0.71 | 6.2 | 1.18 | 111 | 0.78 | 50 | 1.00 | 84 |
| 23 | 1.31 | 84.0 | 1.28 | 126 | 5.25 | 730 | 0.98*a* | 81 |
| 24 | 3.80 | 204.0 | 1.38 | 141 | 4.78 | 658 | 0.96*a* | 78 |
| 25 | 3.65 | 198.0 | 1.18 | 111 | 4.28*a* | 582 | 0.94*a* | 75 |
| 26 | 5.92 | 406.0 | 1.08 | 95 | 3.78*a* | 505 | 0.92*a* | 71 |
| 27 | 5.80 | 385.0 | 0.98 | 81 | 3.28*a* | 430 | 0.90*a* | 69 |
| 28 | 5.10 | 365.0 | 0.95 | 79 | 2.78*a* | 354 | 0.88*a* | 65 |
| 29 | 4.89 | 341.0 | 0.87*a* | 65 | 2.28*a* | 278 | 0.87*a* | 64 |
| 30 | 4.68 | 364.0 | 0.83 | 58 | 1.78*a* | 202 | 0.86*a* | 63 |
| 31 | 5.47 | 442.0 | ..... | ..... | 1.28*a* | 126 | ..... | ..... |

*a* Interpolated gauge height.

DAILY GAUGE HEIGHT AND DISCHARGE of Frenchman River at Buzzard's Ranch, for 1915. —*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 0.85*a* | 61 | 0.82*a* | 56 | 0.59*a* | 21.0 | 0.65*a* | 26 |
| 2 | 0.84*a* | 59 | 0.81*a* | 55 | 0.58*a* | 19.8 | 0.65*a* | 26 |
| 3 | 0.83*a* | 57 | 0.80*a* | 53 | 0.57*a* | 19.2 | 0.65*a* | 26 |
| 4 | 0.82*a* | 56 | 0.79 | 57 | 0.57*a* | 19.2 | 0.65*a* | 26 |
| 5 | 0.81*a* | 55 | 0.77*a* | 49 | 0.56*a* | 18.6 | 0.65*a* | 26 |
| 6 | 0.80*a* | 53 | 0.75*a* | 46 | 0.56*a* | 18.6 | 0.65*a* | 26 |
| 7 | 0.79*a* | 52 | 0.74*a* | 44 | 0.55*a* | 18.0 | 0.65*a* | 26 |
| 8 | 0.78*a* | 50 | 0.73*a* | 42 | 0.55 | 18.0 | 0.65*a* | 26 |
| 9 | 0.77*a* | 49 | 0.72*a* | 41 | 0.56*a* | 18.6 | 0.65*a* | 26 |
| 10 | 0.76 | 49 | 0.71*a* | 40 | 0.56*a* | 18.6 | 0.65*a* | 26 |
| 11 | 0.78*a* | 50 | 0.69*a* | 36 | 0.57*a* | 19.2 | 0.65*a* | 26 |
| 12 | 0.80*a* | 53 | 0.68*a* | 34 | 0.57*a* | 19.2 | 0.65*a* | 26 |
| 13 | 0.82*a* | 56 | 0.69 | 31 | 0.58*a* | 19.8 | 0.65*a* | 26 |
| 14 | 0.84*a* | 59 | 0.67*a* | 28 | 0.58*a* | 19.8 | 0.66 | 27 |
| 15 | 0.86*a* | 62 | 0.67*a* | 28 | 0.59*a* | 21 0 | 0.66*a* | 27 |
| 16 | 0.88*a* | 65 | 0.67*a* | 28 | 0.60*a* | 21.0 | 0.66*a* | 27 |
| 17 | 0.90*a* | 69 | 0.66*a* | 27 | 0.61*a* | 22.0 | 0.66*a* | 27 |
| 18 | 0.92*a* | 72 | 0.66*a* | 27 | 0.62*a* | 23.0 | 0.66*a* | 27 |
| 19 | 0.94*a* | 75 | 0.65*a* | 26 | 0.63*a* | 24.0 | 0.66*a* | 27 |
| 20 | 0.97*a* | 79 | 0.65*a* | 26 | 0.64*a* | 25.0 | 0.66*a* | 27 |
| 21 | 1.00 | 104 | 0.64*a* | 25 | 0.65 | 26.0 | 0.66*a* | 27 |
| 22 | 0.98*a* | 81 | 0.64*a* | 25 | 0.65*a* | 26.0 | 0.66*a* | 27 |
| 23 | 0.96*a* | 78 | 0.63*a* | 24 | 0.65*a* | 26.0 | 0.66*a* | 27 |
| 24 | 0.94*a* | 75 | 0.63*a* | 24 | 0.65*a* | 26.0 | 0.66*a* | 27 |
| 25 | 0.92*a* | 72 | 0.62*a* | 23 | 0.65*a* | 26.0 | 0.65 | 26 |
| 26 | 0.90*a* | 69 | 0.62*a* | 23 | 0.65*a* | 26.0 | ..... | ..... |
| 27 | 0.88*a* | 65 | 0.61*a* | 22 | 0.65*a* | 26.0 | ..... | ..... |
| 28 | 0.86*a* | 62 | 0.61*a* | 22 | 0.65*a* | 26.0 | ..... | ..... |
| 29 | 0.85*a* | 61 | 0.60*a* | 21 | 0.65*a* | 26.0 | ..... | ..... |
| 30 | 0.84*a* | 59 | 0.60*a* | 21 | 0.65*a* | 26.0 | ..... | ..... |
| 31 | 0.83*a* | 57 | 0.60 | 21 | ..... | ..... | ..... | ..... |

*a* Interpolated gauge height.

MONTHLY DISCHARGE of Frenchman River at Buzzard's Ranch, for 1915.

(Drainage area 1,778 square miles.)

| Month. | Discharge in Second Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (20–31) | 442 | 3.9 | 234 | 0.132 | 0.06 | 5,568 |
| April | 1,578 | 58.0 | 498 | 0.280 | 0.31 | 29,633 |
| May | 730 | 34.0 | 165 | 0.093 | 0.11 | 10,145 |
| June | 190 | 3.0 | 69 | 0.039 | 0.04 | 4,106 |
| July | 104 | 49.0 | 63 | 0.035 | 0.04 | 3,874 |
| August | 57 | 21.0 | 33 | 0.019 | 0.02 | 2,029 |
| September | 26 | 18.0 | 22 | 0.012 | 0.01 | 1,309 |
| October (1–25) | 27 | 26.0 | 26 | 0.015 | 0.01 | 1,290 |
| The period | ..... | ..... | ..... | ..... | 0.60 | 57,954 |

LITTLEHREED CREEK NEAR BUZZARD'S RANCH.

*Location.*—On the NW. ¼ Sec. 11, Tp. 2, Rge. 11, W. 3rd Mer., near Corriander Post Office.

*Records available.*—March 28, 1914, to October 31, 1915.

*Gauge.*—Vertical staff. Zero elevation has been maintained at 92.82 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark located on the left bank about 60 feet from the gauge. Assumed elevation, 100.00 feet.

*Channel.*—Probably permanent.
*Discharge measurements.*—Made by meter and by weir at low stages.
*Winter flow.*—This station is not maintained during the winter.
*Observer.*—C. T. MacNamara.

DISCHARGE MEASUREMENTS of Littlebreed Creek near Buzzard's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft* | *Ft. per sec* | *Feet.* | *Sec.-ft.* |
| Mar. 29 | F. R. Steinberger | 18 | 22.0 | 0.58 | 2.50 | 12.80 |
| Mar. 30 | do | 28 | 54.0 | 0.32 | 3.10 | 17.40 |
| Mar. 31 | do | 19 | 27.0 | 0.56 | 2.62 | 15.20 |
| April 1 | do | 19 | 26.0 | 0.54 | 2.50 | 13.80 |
| April 6 | do | 22 | 39.0 | 0.58 | 3.13 | 22.00 |
| April 7 | do | 16 | 21.0 | 0.59 | 2.25 | 12.30 |
| April 8 | do | 14 | 10.0 | 0.68 | 1.62 | 6.70 |
| April 9 | do | 11 | 4.2 | 0.97 | 1.22 | 4.00 |
| April 10 | do | 7 | 2.5 | 0.76 | 1.04 | 1.91 |
| April 12 | do | ..... | ..... | ..... | 0.82 | 0.79*a* |
| April 20 | do | ..... | ..... | ..... | 0.42 | Nil. |
| April 28 | do | ..... | ..... | ..... | Dry. | " |
| June 7 | do | 5 | 3.4 | 0.68 | 1.01 | 2.30 |
| June 16 | do | ..... | ..... | ..... | 0.50 | 0.18*a* |
| July 10 | do | ..... | ..... | ..... | Dry. | Nil. |
| July 21 | do | ..... | ..... | ..... | 0.55 | 0.36*a* |
| Aug. 4 | do | ..... | ..... | ..... | Dry. | Nil. |
| Aug. 13 | do | ..... | ..... | ..... | " | " |
| Aug. 31 | do | ..... | ..... | ..... | " | " |
| Sept. 8 | do | ..... | ..... | ..... | " | " |
| Sept. 21 | do | ..... | ..... | ..... | " | " |
| Oct. 14 | do | ..... | ..... | ..... | " | " |

*a* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Littlebreed Creek near Buzzard's Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.85 | 17.80 | Dry. | Nil. | 1.15 | 3.60 |
| 2 | ..... | ..... | 3.55 | 31.00 | " | " | 2.15 | 10.60 |
| 3 | ..... | ..... | 5.35 | 125.00 | " | " | Dry. | Nil. |
| 4 | ..... | ..... | 4.85 | 95.00 | " | " | " | " |
| 5 | ..... | ..... | 3.90 | 42.00 | " | " | " | " |
| 6 | ..... | ..... | 3.15 | 22.00 | " | " | " | " |
| 7 | ..... | ..... | 2.05 | 9.80 | " | " | " | " |
| 8 | ..... | ..... | 1.55 | 6.20 | " | " | " | " |
| 9 | ..... | ..... | 1.22 | 4.00 | " | " | " | " |
| 10 | ..... | ..... | 1.04 | 2.90 | " | " | " | " |
| 11 | ..... | ..... | 0.93*a* | 2.30 | " | " | " | " |
| 12 | ..... | ..... | 0.82 | 1.76 | " | " | " | " |
| 13 | ..... | ..... | 1.25 | 4.20 | " | " | " | " |
| 14 | ..... | ..... | 1.15 | 3.60 | " | " | " | " |
| 15 | ..... | ..... | 1.05 | 3.00 | 2.45 | 13.30 | " | " |
| 16 | ..... | ..... | 0.45 | 0.09 | 2.55 | 14.30 | " | |
| 17 | ..... | ..... | 0.35 | Nil. | 2.75 | 16.60 | " | " |
| 18 | ..... | ..... | Dry. | " | 1.35 | 4.80 | " | " |
| 19 | ..... | ..... | " | " | 1.05 | 3.00 | " | " |
| 20 | ..... | ..... | " | " | 1.00 | 2.70 | " | " |
| 21 | ..... | ..... | " | " | 0.95 | 2.40 | " | " |
| 22 | ..... | ..... | " | " | 0.85 | 1.93 | " | " |
| 23 | ..... | ..... | " | " | 0.75 | 1.38 | " | " |
| 24 | ..... | ..... | " | " | 0.66 | 0.90 | " | " |
| 25 | ..... | ..... | " | " | Dry. | Nil. | " | " |
| 26 | ..... | ..... | " | " | " | " | " | " |
| 27 | ..... | ..... | " | " | " | " | " | " |
| 28 | 3.15 | 22.0 | " | " | " | " | " | " |
| 29 | 2.75 | 16.6 | " | " | " | " | " | " |
| 30 | 3.10 | 21.0 | " | " | " | " | " | " |
| 31 | 2.95 | 19.1 | ..... | ..... | " | " | ..... | ..... |

*a* Interpolated.
Dry July 1 to Oct. 31.

MONTHLY DISCHARGE of Littlebreed Creek near Buzzard's Ranch, for 1915.

(Drainage area 61 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (28–31) | 22.0 | 16.60 | 20.00 | 0.328 | 0.05 | 159 |
| April | 125.0 | 0.09 | 12.30 | 0.201 | 0.22 | 732 |
| May | 16.6 | 0.90 | 2.00 | 0.033 | 0.04 | 123 |
| June | 10.6 | 3.60 | 0.47 | 0.008 | 0.01 | 28 |
| July | ..... | ..... | ..... | ..... | ..... | Nil. |
| August | ..... | ..... | ..... | ..... | ..... | " |
| September | ..... | ..... | ..... | ..... | ..... | " |
| October | ..... | ..... | ..... | ..... | ..... | " |
| The period | ..... | ..... | ..... | ..... | 0.32 | 1,042 |

FRENCHMAN RIVER AT MARTIN'S RANCH.

*Location.*—On the NW. ¼ Sec. 24, Tp. 1, Rge. 11, W. 3rd Mer., about five miles below station at Buzzard's ranch.

*Records available.*—Two discharge measurements only in 1915.

*Gauge.*—Vertical staff on right bank just above trail crossing.

*Bench-marks.*—Temporary. No. 1: Top of wooden plug, 40 feet east of rod at fence. Elevation 8.58 feet above zero of gauge. No. 2: On left corner of west window sill of S. A. Martin's house. Elevation 17.46 feet above zero of gauge.

*Discharge measurements.*—Made by wading at crossing below gauge or from cable at Buzzard's ranch.

*Remarks.*—This station was established to take the place of that at Buzzard's ranch on September 22, 1915, as an observer could not be obtained at that point.

DISCHARGE MEASUREMENTS of Frenchman River at Martin's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Sept. 22 | G. H. Whyte and F. R. Steinberger | 47 | 29 | 0.91 | 1.00 | 26 |
| Oct. 15 | F. R. Steinberger | 47 | 28 | 0.92 | 1.00 | 26 |

MCEACHRAN CREEK AT MCCOY'S RANCH.

*Location.*—On the SW. ¼ Sec. 6, Tp. 1, Rge. 7, W. 3rd Mer., about fifty feet north of Mr. McCoy's house.

*Records available.*—May 1, 1914, to October 31, 1915.

*Gauge.*—Vertical staff. Zero elevation has been maintained at 89.5 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Probably permanent.

*Discharge measurements.*—Made with meter and by weir at low stages.

*Winter flow.*—Station not maintained during the winter.

*Diversion.*—There is no diversion from this stream.

*Observer.*—Donald McCoy.

DISCHARGE MEASUREMENTS of McEachran Creek at McCoy's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 23 | F. R. Steinberger | ..... | ..... | ..... | 0.50 | 0.35*a* |
| June 11 | do | 3.5 | 1.92 | 1.28 | 0.92 | 2.40 |
| July 14 | do | ..... | ..... | ..... | 0.41 | 0.11*a* |
| July 17 | do | ..... | ..... | ..... | 0.45 | 0.28*a* |
| Sept. 4 | do | ..... | ..... | ..... | Dry. | Nil. |
| Oct. 19 | do | ..... | ..... | ..... | " | " |

*a* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of McEachran Creek at McCoy's Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.85 | 8.60 | 0.34 | 0.08 | 1.18 | 4.10 |
| 2 | ..... | ..... | 2.05 | 10.00 | 0.34 | 0.08 | 1.18 | 4.10 |
| 3 | ..... | ..... | 2.60 | 13.60 | 0.34 | 0.08 | 1.18 | 4.10 |
| 4 | ..... | ..... | 2.85 | 15.30 | 0.34 | 0.08 | 1.18 | 4.10 |
| 5 | ..... | ..... | 2.40 | 12.30 | 0.32 | 0.06 | 1.18 | 4.10 |
| 6 | ..... | ..... | 1.75 | 8.00 | 0.29 | 0.04 | 1.23 | 4.50 |
| 7 | ..... | ..... | 1.55 | 6.60 | 0.29 | 0.04 | 1.21 | 4.30 |
| 8 | ..... | ..... | 1.30 | 4.90 | 0.24 | 0.03 | 1.13 | 3.80 |
| 9 | ..... | ..... | 1.25 | 4.60 | 0.14 | 0.01 | 1.03 | 3.10 |
| 10 | ..... | ..... | 1.25 | 4.60 | 0.14 | 0.01 | 0.85 | 1.94 |
| 11 | ..... | ..... | 1.10 | 3.60 | Dry. | Nil. | 0.78 | 1.51 |
| 12 | ..... | ..... | 1.00 | 2.90 | " | " | 0.75 | 1.35 |
| 13 | ..... | ..... | 0.95 | 2.60 | " | " | 0.70 | 1.08 |
| 14 | ..... | ..... | 0.85 | 1.94 | 0.44 | 0.22 | 0.70 | 1.08 |
| 15 | ..... | ..... | 0.80 | 1.62 | 0.52 | 0.41 | 0.68 | 0.99 |
| 16 | ..... | ..... | 0.75 | 1.35 | 0.56 | 0.53 | 0.62 | 0.74 |
| 17 | ..... | ..... | 0.70 | 1.08 | 0.49 | 0.33 | 0.60 | 0.65 |
| 18 | ..... | ..... | 0.65 | 0.86 | 0.44 | 0.22 | 0.60 | 0.65 |
| 19 | ..... | ..... | 0.65 | 0.86 | 0.44 | 0.22 | 0.60 | 0.65 |
| 20 | ..... | ..... | 0.60 | 0.65 | 0.39 | 0.13 | 0.60 | 0.65 |
| 21 | ..... | ..... | 0.55 | 0.50 | 0.39 | 0.13 | 0.58 | 0.59 |
| 22 | ..... | ..... | 0.55 | 0.50 | 0.39 | 0.13 | 0.55 | 0.50 |
| 23 | ..... | ..... | 0.53 | 0.44 | 0.39 | 0.13 | 0.55 | 0.50 |
| 24 | 1.40 | 5.6 | 0.50 | 0.35 | 0.39 | 0.13 | 0.55 | 0.50 |
| 25 | 2.50 | 13.0 | 0.50 | 0.35 | 0.44 | 0.22 | 0.52 | 0.41 |
| 26 | 2.50 | 13.0 | 0.50 | 0.35 | 4.57 | 27.00 | 0.60 | 0.65 |
| 27 | 2.40 | 12.3 | 0.45 | 0.24 | 3.34 | 18.60 | 0.55 | 0.50 |
| 28 | 2.15 | 10.6 | 0.45 | 0.24 | 1.84 | 8.60 | 0.68 | 0.99 |
| 29 | 2.05 | 10.0 | 0.40 | 0.14 | 1.49 | 6.20 | 1.10 | 3.60 |
| 30 | 2.05 | 10.0 | 0.37 | 0.11 | 1.39 | 5.50 | 1.10 | 3.60 |
| 31 | 1.95 | 9.3 | ..... | ..... | 1.26 | 4.70 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of McEachran Creek at McCoy's Ranch, for 1915. —*Concluded.*

| Day. | July. | | August. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 0.78 | 1.51 | 0.20 | 0.02 |
| 2 | 0.70 | 1.08 | 0.18 | 0.02 |
| 3 | 0.65 | 0.86 | 0.18 | 0.02 |
| 4 | 0.62 | 0.74 | 0.18 | 0.02 |
| 5 | 0.60 | 0.65 | 0.18 | 0.02 |
| 6 | 0.58 | 0.59 | 0.18 | 0.02 |
| 7 | 0.52 | 0.41 | 0.18 | 0.02 |
| 8 | 0.50 | 0.35 | 0.17 | 0.02 |
| 9 | 0.50 | 0.35 | 0.17 | 0.02 |
| 10 | 0.50 | 0.35 | 0.17 | 0.02 |
| 11 | 0.48 | 0.31 | 0.17 | 0.02 |
| 12 | 0.40 | 0.14 | 0.17 | 0.02 |
| 13 | 0.34 | 0.07 | 0.17 | 0.02 |
| 14 | 0.42 | 0.18 | 0.17 | 0.02 |
| 15 | 0.37 | 0.11 | 0.17 | 0.02 |
| 16 | 0.46 | 0.27 | 0.17 | 0.02 |
| 17 | 0.46 | 0.27 | 0.17 | 0.02 |
| 18 | 0.45 | 0.24 | 0.17 | 0.02 |
| 19 | 0.44 | 0.22 | 0.17 | 0.02 |
| 20 | 0.40 | 0.14 | 0.17 | 0.02 |
| 21 | 0.36 | 0.10 | 0.16 | 0.02 |
| 22 | 0.35 | 0.09 | 0.16 | 0.02 |
| 23 | 0.34 | 0.08 | 0.16 | 0.02 |
| 24 | 0.32 | 0.06 | 0.16 | 0.02 |
| 25 | 0.30 | 0.04 | 0.15 | 0.02 |
| 26 | 0.30 | 0.04 | 0.14 | 0.01 |
| 27 | 0.28 | 0.04 | 0.13 | 0.01 |
| 28 | 0.25 | 0.03 | 0.12 | 0.01 |
| 29 | 0.25 | 0.03 | 0.10 | 0.01 |
| 30 | 0.25 | 0.03 | 0.06 | Nil.a |
| 31 | 0.22 | 0.02 | 0.04 | " |

*a* Dry until Oct. 31.

MONTHLY DISCHARGE of McEachran Creek at McCoy's Ranch, for 1915.

(Drainage area 107 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per Square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (21-31) | 13.00 | 5.60 | 10.50 | 0.098 | 0.029 | 127 |
| April | 15.30 | 0.11 | 3.60 | 0.034 | 0.038 | 214 |
| May | 27.00 | Nil. | 2.40 | 0.022 | 0.025 | 147 |
| June | 4.50 | 0.41 | 1.90 | 0.018 | 0.002 | 113 |
| July | 1.51 | 0.02 | 0.30 | 0.003 | 0.003 | 18 |
| August | 0.02 | Nil. | 0.02 | 0.001 | 0.001 | 1 |
| September | ..... | ..... | ..... | ..... | ..... | Nil |
| October | ..... | ..... | ..... | ..... | ..... | " |
| The period | ..... | ..... | ..... | ..... | 0.038 | [illegible] |

HORSE CREEK NEAR BARNARD, MONTANA, U.S.A.

*Location.*—About one mile north of Barnard post office on United States unsurveyed land and about one-quarter mile south of the international boundary.

*Records available.*—May 1, 1914, to October 31, 1915.

*Gauge.*—Staff gauge, fastened to a post on the right bank. The elevation of the zero of the gauge has been maintained at 92.54 feet since establishment.

*Bench-mark.*—Wooden plug driven in the left bank 30 feet from the gauge. Assumed elevation, 100.00 feet.

*Channel.*—Probably permanent.

*Discharge measurements.*—Made by wading with meter and by weir at low stages.

*Winter flow.*—This station is not maintained during the winter.

*Observer.*—W. J. Harris.

DISCHARGE MEASUREMENTS of Horse Creek near Barnard, Mont., U.S.A., in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 24 | F. R. Steinberger | ..... | ..... | ..... | 0.44 | 0.336 |
| June 12 | do | ..... *a* | ..... | ..... | 0.44 | 0.351 |
| July 15 | do | ..... *a* | ..... | ..... | 0.30 | Nil. |
| Aug. 9 | do | ..... | ..... | ..... | 0.00 | " |
| Sept. 4 | do | ..... | ..... | ..... | 0.00 | " |
| Oct. 19 | do | ..... *a* | ..... | ..... | 0.24 | " |

*a* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Horse Creek near Barnard, Mont., U.S.A., for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.20 | 14.00 | Dry. | Nil. | 0.44 | 0.64 |
| 2 | ..... | ..... | 2.50 | 87.00 | " | " | 0.44 | 0.64 |
| 3 | ..... | ..... | 3.10 | 135.00 | " | " | 0.44 | 0.64 |
| 4 | ..... | ..... | 4.00 | 207.00 | " | " | 0.43 | 0.58 |
| 5 | ..... | ..... | 3.50 | 167.00 | " | " | 0.52 | 1.20 |
| 6 | ..... | ..... | 3.10 | 135.00 | " | " | 0.53 | 1.30 |
| 7 | ..... | ..... | 3.00 | 127.00 | " | " | 0.51 | 1.10 |
| 8 | ..... | ..... | 2.70 | 103.00 | " | " | 0.49 | 0.94 |
| 9 | ..... | ..... | 2.50 | 87.00 | " | " | 0.49 | 0.94 |
| 10 | ..... | ..... | 2.50 | 87.00 | " | " | 0.48 | 0.88 |
| 11 | ..... | ..... | 2.00 | 51.00 | " | " | 0.46 | 0.76 |
| 12 | ..... | ..... | 1.50 | 24.00 | " | " | 0.44 | 0.64 |
| 13 | ..... | ..... | 1.18 | 13.40 | " | " | 0.44 | 0.64 |
| 14 | ..... | ..... | 0.93 | 7.00 | 0.50 | 1.00 | 0.44 | 0.64 |
| 15 | ..... | ..... | 0.83 | 5.00 | 0.60 | 2.00 | 0.44 | 0.64 |
| 16 | ..... | ..... | 0.68 | 2.80 | 0.45 | 0.70 | 0.44 | 0.64 |
| 17 | ..... | ..... | 0.58 | 1.80 | 0.45 | 0.70 | 0.44 | 0.64 |
| 18 | ..... | ..... | 0.58 | 1.80 | 0.44 | 0.64 | 0.44 | 0.64 |
| 19 | ..... | ..... | 0.63 | 2.30 | 0.44 | 0.64 | 0.44 | 0.64 |
| 20 | ..... | ..... | 0.58 | 1.80 | 0.42 | 0.52 | 0.44 | 0.64 |
| 21 | ..... | ..... | 0.54 | 1.40 | 0.42 | 0.52 | 0.44 | 0.64 |
| 22 | ..... | ..... | 0.52 | 1.20 | 0.42 | 0.52 | 0.45 | 0.70 |
| 23 | ..... | ..... | 0.48 | 0.88 | 0.42 | 0.52 | 0.45 | 0.70 |
| 24 | ..... | ..... | 0.44 | 0.64 | 0.42 | 0.52 | 0.45 | 0.70 |
| 25 | ..... | ..... | 0.40 | 0.40 | 1.00 | 8.40 | 0.45 | 0.70 |
| 26 | ..... | ..... | 0.35 | 0.20 | 2.30 | 71.00 | 0.45 | 0.70 |
| 27 | ..... | ..... | 0.34 | 0.16 | 2.00 | 51.00 | 0.46 | 0.76 |
| 28 | 0.50 | 1.00 | 0.33 | 0.12 | 1.50 | 24.00 | 0.46 | 0.76 |
| 29 | 0.50 | 1.00 | 0.36 | 0.24 | 1.00 | 8.40 | 0.46 | 0.76 |
| 30 | 1.00 | 8.40 | 0.33 | 0.12 | 1.75 | 36.00 | 0.46 | 0.76 |
| 31 | 1.00 | 8.40 | ..... | ..... | 0.50 | 1.00 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Horse Creek near Barnard, Mont., U.S.A., for 1915. —*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 0.47 | 0.82 | Dry. | Nil. | Dry. | Nil. | 0.25 | Nil. |
| 2 | 0.46 | 0.76 | " | " | " | " | 0.26 | " |
| 3 | 0.44 | 0.64 | " | " | " | " | 0.26 | " |
| 4 | 0.44 | 0.40 | " | " | " | " | 0.28 | " |
| 5 | 0.39 | 0.36 | " | " | " | " | 0.29 | " |
| 6 | 0.36 | 0.24 | " | " | " | " | 0.30 | " |
| 7 | 0.35 | 0.20 | " | " | " | " | 0.30 | " |
| 8 | 0.35 | 0.20 | " | " | " | " | 0.30 | " |
| 9 | 0.35 | 0.20 | " | " | " | " | 0.32 | 0.08 |
| 10 | 0.35 | 0.20 | " | " | " | " | 0.32 | 0.08 |
| 11 | 0.34 | 0.16 | " | " | " | " | 0.34 | 0.16 |
| 12 | 0.34 | 0.16 | " | " | 0.25 | " | 0.34 | 0.16 |
| 13 | 0.33 | 0.12 | " | " | 0.25 | " | 0.35 | 0.20 |
| 14 | 0.33 | 0.12 | " | " | 0.30 | " | 0.35 | 0.20 |
| 15 | 0.33 | 0.12 | " | " | 0.31 | 0.04 | 0.35 | 0.20 |
| 16 | 0.33 | 0.12 | 0.25 | " | 0.30 | Nil. | 0.35 | 0.20 |
| 17 | Dry. | Nil. | 0.30 | " | 0.30 | " | 0.35 | 0.20 |
| 18 | " | " | 0.25 | " | 0.30 | " | 0.35 | 0.20 |
| 19 | " | " | Dry. | " | 0.32 | 0.08 | 0.35 | 0.20 |
| 20 | " | " | " | " | 0.35 | 0.20 | 0.34 | 0.16 |
| 21 | " | " | " | " | 0.37 | 0.28 | 0.33 | 0.12 |
| 22 | 0.35 | 0.20 | " | " | 0.40 | 0.40 | 0.32 | 0.08 |
| 23 | 0.35 | 0.20 | " | " | 0.45 | 0.70 | 0.30 | Nil. |
| 24 | 0.34 | 0.16 | " | " | 0.40 | 0.40 | 0.30 | " |
| 25 | 0.30 | 0.00 | " | " | 0.40 | 0.40 | 0.30 | " |
| 26 | 0.30 | 0.00 | " | " | 0.35 | 0.20 | 0.28 | " |
| 27 | Dry. | Nil. | " | " | 0.30 | Nil. | 0.28 | " |
| 28 | " | " | " | " | 0.30 | " | 0.27 | " |
| 29 | " | " | " | " | 0.25 | " | 0.27 | " |
| 30 | " | " | " | " | 0.25 | " | 0.25 | " |
| 31 | " | " | " | " | ..... | ..... | 0.25 | " |

MONTHLY DISCHARGE of Horse Creek near Barnard, Mont., U.S.A., for 1915.

(Drainage area 71 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (28-31) | 8.40 | 1.00 | 4.70 | 0.0660 | 0.070 | 34 |
| April | 207.00 | 0.12 | 42.00 | 0.5920 | 0.660 | 2,499 |
| May | 71.00 | 0.00 | 6.70 | 0.0940 | 0.180 | 412 |
| June | 1.30 | 0.58 | 0.75 | 0.0110 | 0.011 | 45 |
| July | 0.82 | Nil. | 0.17 | 0.0024 | 0.003 | 12 |
| August | Nil. | " | Nil. | Nil. | Nil. | Nil. |
| September | 0.70 | " | 0.09 | 0.0013 | 0.001 | 5 |
| October | 0.20 | " | 0.07 | 0.0010 | 0.001 | 4 |
| The period | | | | | 0.854 | 3,011 |

BOWREY DITCH FROM ROCK CREEK, MONTANA, U.S.A.

*Location.*—In United States unsurveyed territory near Barnard, Montana.
*Records available.*—June 1, August 26, 1914. No records obtainable in 1915.
*Gauge.*—Vertical staff. Elevation of zero, 96.51 feet.
*Bench-mark.*—Stake on left bank. Assumed elevation, 100.00 feet.
*Discharge measurements.*—By wading.
*Observer.*—C. W. Bowrey.

ROCK CREEK NEAR BARNARD, MONTANA, U.S.A.

*Location.*—On United States unsurveyed land, about one-half mile south of the international boundary.

*Records available.*—May 1, 1914, to October 31, 1915.

*Gauge.*—Vertical staff on the right bank of the creek 120 feet below Mr. Bowrey's dam. The elevation of the zero of the gauge was maintained at 91.83 feet up to October 19, 1915, at the old station one-quarter mile downstream. New station was established on October 19, 1915, with an elevation of zero at 91.91 feet.

*Bench-mark.*—Wooden plug 20 feet from rod. Assumed elevation, 100.00 feet.

*Channel.*—Permanent.

*Discharge measurements.*—Made by wading.

*Winter flow.*—Station not maintained during the winter.

*Observer.*—Chas. Bowrey.

DISCHARGE MEASUREMENTS of Rock Creek near Barnard, Montana, U.S.A., in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 24 | F. R. Steinberger | 11.0 | 4.60 | 2.08 | ..... | 9.6 |
| June 12 | do | 14.3 | 5.86 | 1.00 | 0.83 | 5.9 |
| July 15 | do | 15.0 | 3.90 | 0.67 | 0.66 | 2.6 |
| Aug. 9 | do | 8.5 | 4.08 | 0.63 | 0.64 | 2.6 |
| Sept. 4 | do | ..... | ..... | ..... | 0.25 | .....*a* |
| Oct. 19 | do | 9.7 | 2.87 | 0.46 | 1.65 | 1.3 |

*a* Small trickle, too small to measure.

DAILY GAUGE HEIGHT AND DISCHARGE of Rock Creek near Barnard, Montana, U.S.A., for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.86 | 30.0*b* | 0.95*a* | 8.3 | 1.26 | 14.9 |
| 2 | ..... | ..... | 2.86 | 32.0*b* | 0.91 | 7.5 | 1.11 | 11.7 |
| 3 | ..... | ..... | 3.46*a* | 35.0*b* | 0.91 | 7.5 | ..... | 11.0*b* |
| 4 | ..... | ..... | 4.90*a* | 44.0*b* | 0.91*a* | 7.5 | ..... | 10.6*b* |
| 5 | ..... | ..... | 4.14*a* | 52.0*b* | 0.91 | 7.5 | ..... | 10.2*b* |
| 6 | ..... | ..... | 3.36 | 61.0 | 0.91*a* | 7.5 | ..... | 9.8*b* |
| 7 | ..... | ..... | 2.36 | 39.0 | 0.91*a* | 7.5 | ..... | 9.4*b* |
| 8 | ..... | ..... | 2.11 | 34.0 | 0.90 | 7.3 | ..... | 8.2*b* |
| 9 | ..... | ..... | 2.11 | 34.0 | ..... | 6.5*b* | ..... | 7.5*b* |
| 10 | ..... | ..... | 2.11 | 34.0 | ..... | 6.2*b* | ..... | 6.8*b* |
| 11 | ..... | ..... | 1.36 | 17.1 | ..... | 5.0*b* | ..... | 6.2*b* |
| 12 | ..... | ..... | 1.26 | 14.9 | ..... | 3.2*b* | 0.83 | 5.8 |
| 13 | ..... | ..... | 1.21 | 13.8 | ..... | 2.4*b* | ..... | 5.7*b* |
| 14 | ..... | ..... | 1.14*a* | 12.3 | ..... | 2.2*b* | ..... | 5.5*b* |
| 15 | ..... | ..... | 1.06 | 10.6 | ..... | 5.4*b* | ..... | 5.4*b* |
| 16 | ..... | ..... | 1.06 | 10.6 | ..... | 10.2*b* | ..... | 4.8*b* |
| 17 | ..... | ..... | 1.06 | 10.6 | ..... | 9.4*b* | ..... | 4.6*b* |
| 18 | ..... | ..... | 1.02 | 9.8 | ..... | 9.4*b* | ..... | 4.8*b* |
| 19 | ..... | ..... | 1.00 | 9.4 | ..... | 8.6*b* | ..... | 5.2*b* |
| 20 | ..... | ..... | 0.96 | 8.5 | ..... | 8.2*b* | ..... | 4.8*b* |
| 21 | ..... | ..... | 1.00 | 9.4 | ..... | 7.6*b* | ..... | 4.6*b* |
| 22 | ..... | ..... | 1.06 | 10.6 | ..... | 7.4*b* | ..... | 4.4*b* |
| 23 | ..... | ..... | 1.03 | 10.0 | ..... | 6.6*b* | ..... | 3.6*b* |
| 24 | 5.48 | 24*b* | 1.03 | 10.0 | ..... | 6.0*b* | ..... | 3.0*b* |
| 25 | 5.16 | 40*b* | 1.02 | 9.8 | ..... | 5.4*b* | ..... | 2.8*b* |
| 26 | 4.36 | 25*b* | 1.01*a* | 9.6 | ..... | 70.0*b* | ..... | 5.6*b* |
| 27 | 4.06 | 30*b* | 1.01 | 9.6 | 3.36 | 61.0 | ..... | 8.4*b* |
| 28 | 3.56 | 28*b* | 1.11 | 11.7 | 2.16 | 35.0 | ..... | 10.6*b* |
| 29 | 3.32 | 34*b* | 1.02*a* | 9.8 | 1.86 | 28.0 | ..... | 10.4*b* |
| 30 | 3.13 | 30*b* | 1.00*a* | 9.4 | 1.60 | 22.0 | ..... | 11.6*b* |
| 31 | 2.94*a* | 28*b* | ..... | ..... | 1.34 | 16.7 | ..... | ..... |

*a* Interpolated.
*b* Estimated.

DAILY GAUGE HEIGHT AND DISCHARGE of Rock Creek near Barnard, Montana, U.S.A., for 1915. —*Concluded.*

| Day | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | 10.4*c* | 0.75*a* | 4.30 | 0.35*a* | 0.25 | 0.65 | 0.01 |
| 2 | ..... | 8.6*c* | 0.75 | 4.30 | 0.33*a* | 0.19 | 0.69*a* | 0.02 |
| 3 | ..... | 8.2*c* | 0.75*a* | 4.30 | 0.29*a* | 0.09 | 0.80*a* | 0.05 |
| 4 | ..... | 7.6*c* | 0.74 | 4.10 | 0.25*a* | 0.05 | 1.50 | 5.20 |
| 5 | ..... | 7.6*c* | 0.72*a* | 3.70 | 0.25*a* | 0.07*b* | 1.25*a* | 1.20 |
| 6 | ..... | 6.8*c* | 0.70 | 3.30 | 0.24*a* | 0.07 | 1.00 | 0.08 |
| 7 | ..... | 6.2*c* | 0.72*a* | 3.70 | 0.25*a* | 0.08 | 1.00*a* | 0.06 |
| 8 | ..... | 6.0*c* | 0.74 | 4.10 | 0.28*a* | 0.08 | 1.00 | 0.04 |
| 9 | ..... | 5.6*c* | 0.64 | 2.50 | 0.31*a* | 0.10 | 0.95*a* | 0.02 |
| 10 | ..... | 5.4*c* | 0.65*a* | 2.60 | 0.30*a* | 0.10 | 0.90 | 0.01 |
| 11 | 0.80 | 5.2 | 0.67*a* | 2.90 | 0.32*a* | 0.11 | 1.00*a* | 0.02 |
| 12 | 0.80 | 5.2 | 0.68 | 3.00 | 0.34*a* | 0.12 | 1.08*a* | 0.06 |
| 13 | 0.78 | 4.9 | 0.65 | 2.60 | 0.38*a* | 0.13 | 1.16*a* | 0.08 |
| 14 | 0.75 | 4.3 | 0.65 | 2.60 | 0.75 | 1.30 | 1.25*a* | 0.14 |
| 15 | 0.68 | 3.0 | 0.65*a* | 2.60 | 0.72*a* | 0.95 | 1.33*a* | 0.20 |
| 16 | 0.74*a* | 4.1 | 0.65 | 2.60 | 0.70 | 0.68 | 1.42*a* | 0.40 |
| 17 | 0.79*a* | 5.0 | 0.65*a* | 2.60 | 0.69*a* | 0.54 | 1.48*a* | 0.60 |
| 18 | 0.85 | 6.2 | 0.64 | 2.50 | 0.68 | 0.57 | 1.57*a* | 0.90 |
| 19 | 0.92 | 7.7 | 0.62*a* | 2.20 | 0.67*a* | 0.42 | 1.65 | 1.33*b* |
| 20 | 1.00 | 9.4 | 0.60*a* | 1.90 | 0.67*a* | 0.35 | ..... | 1.02*c* |
| 21 | 0.97*a* | 8.8 | 0.56*a* | 1.54 | 0.65 | 0.22 | ..... | 0.72*c* |
| 22 | 0.93 | 7.9 | 0.54*a* | 1.36 | 0.65*a* | 0.15 | ..... | 0.40*c* |
| 23 | 0.91*a* | 7.5 | 0.52*a* | 1.18 | 0.65*a* | 0.11 | ..... | 0.28*c* |
| 24 | 0.89*a* | 7.1 | 0.50*a* | 1.00 | 0.65 | 0.08 | ..... | 0.22*c* |
| 25 | 0.87 | 6.7 | 0.48*a* | 0.88 | 0.67*a* | 0.07 | ..... | 0.24*c* |
| 26 | 0.86*a* | 6.5 | 0.46*a* | 0.76 | 0.68 | 0.07 | ..... | 0.42*c* |
| 27 | 0.85 | 6.2 | 0.45*a* | 0.70 | 0.67*a* | 0.05 | ..... | 0.36*c* |
| 28 | 0.82*a* | 5.6 | 0.44*a* | 0.64 | 0.66*a* | 0.04 | ..... | 0.25*c* |
| 29 | 0.80 | 5.2 | 0.42*a* | 0.52 | 0.65 | 0.03 | ..... | 0.18*c* |
| 30 | 0.78*a* | 4.8 | 0.40*a* | 0.40 | 0.65*a* | 0.02 | ..... | 0.22*c* |
| 31 | 0.75 | 4.3 | 0.38*a* | 0.34 | ..... | ..... | ..... | 0.16*c* |

*a* Interpolated.
*b* to *b* Shifting conditions.
*c* Estimated.

MONTHLY DISCHARGE of Rock Creek near Barnard, Montana, U.S.A., for 1915

(Drainage area 230 square miles.)

| Month. | Discharge in Second-Feet | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet |
| March (24-31) | 40.00 | 24.00 | 30.00 | 0.130 | 0.04 | 476 |
| April | 61.00 | 8.50 | 20.00 | 0.087 | 0.10 | 1,190 |
| May | 70.00 | 2.20 | 13.00 | 0.057 | 0.07 | 799 |
| June | 14.90 | 2.80 | 7.30 | 0.032 | 0.04 | 434 |
| July | 10.40 | 3.00 | 6.40 | 0.028 | 0.03 | 394 |
| August | 4.30 | 0.34 | 2.30 | 0.010 | 0.01 | 141 |
| September | 1.30 | 0.02 | 0.24 | 0.001 | 0.01 | 15 |
| October | 5.20 | 0.01 | 0.48 | 0.002 | 0.01 | 30 |
| The period | ..... | ..... | ..... | ..... | 0.31 | 3,179 |

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Frenchman River drainage basin, in 1915.

| Date. | Engineer. | Stream. | Location. | Width. | Area of Section. | Mean. Velocity. | Discharge. |
|---|---|---|---|---|---|---|---|
| | | | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Sec.-ft.* |
| Mar. 30 | M. H. French | Belanger Creek | SW. 30-6-25-3 | 9.0 | 6.50 | 3.58 | 24.000 |
| April 12 | do | do | do | 14.0 | 6.60 | 2.06 | 13.600 |
| July 15 | J. E. Caughey | Blacktail Creek | NW. 20-6-23-3 | *a* | | | 0.282 |
| Aug. 5 | do | do | do | *a* | | | 0.282 |
| Aug. 25 | do | do | do | *a* | | | 0.239 |
| Sept. 25 | do | do | do | *a* | | | 0.428 |
| Oct. 14 | do | do | do | *a* | | | 0.332 |
| Oct. 28 | do | do | do | *a* | | | 0.302 |
| April 22 | F. R. Steinberger | Bluff Creek | SE. 10-2-9-3 | *a* | | | 0.058 |
| July 12 | J. E. Caughey | Calf Creek | SE. 5-8-22-3 | 4.5 | 1.25 | 1.05 | 1.310 |
| Aug. 4 | do | do | do | 4.5 | 1.10 | 1.55 | 1.700 |
| Aug. 24 | do | do | do | *a* | | | 1.050 |
| Sept. 24 | do | do | do | *a* | | | 0.919 |
| Oct. 13 | do | do | do | *a* | | | 1.320 |
| July 13 | do | Concrete Coulee | NW. 2-7-23-3 | *a* | | | 0.998 |
| Aug. 4 | do | do | do | *a* | | | 0.494 |
| Aug. 25 | do | do | do | *a* | | | 0.836 |
| Sept. 25 | do | do | do | *a* | | | 1.090 |
| Oct. 14 | do | do | do | *a* | | | 1.134 |
| Oct. 28 | do | do | do | *a* | | | 1.178 |
| July 13 | do | Doyle Coulee | SW. 17-7-22-3 | *a* | | | 0.520 |
| Aug. 4 | do | do | do | *a* | | | 0.420 |
| Aug. 25 | do | do | do | *a* | | | 0.217 |
| Sept. 25 | do | do | do | *a* | | | 0.302 |
| Oct. 14 | do | do | do | *a* | | | 0.302 |
| Oct. 28 | do | do | do | *a* | | | 0.332 |
| April 12 | M. H. French | Frenchman River | SE. 19-6-25-3 | | | | 3.000*c* |
| July 16 | J. E. Caughey | do | do | 7.0 | 2.90 | 0.79 | 2.300 |
| Aug. 6 | do | do | do | 5.0 | 1.25 | 0.32 | 0.399 |
| Aug. 27 | do | do | do | *a* | | | 0.039 |
| Sept. 28 | do | do | do | *a* | | | 0.302 |
| Oct. 18 | do | do | do | *a* | | | 0.028 |
| Oct. 29 | do | do | do | *a* | | | 0.015 |
| Mar. 18 | M. H. French | do | SE. 32-6-21-3 | 21.0 | 17.80 | 1.09 | 19.200 |
| Mar. 19 | do | do | do | 21.0 | 16.95 | 1.05 | 17.200 |
| Mar. 20 | do | do | do | 21.0 | 18.65 | 1.06 | 19.800 |
| Mar. 21 | do | do | do | 23.0 | 21.15 | 1.23 | 26.000 |
| Mar. 24 | do | do | do | 42.0 | 32.60 | 4.15 | 134.000 |
| Mar. 26 | do | do | do | 41.0 | 25.65 | 2.13 | 55.000 |
| Mar. 29 | do | do | NW. 25-6-22-3 | 23.0 | 24.10 | 1.65 | 40.000 |
| April 19 | do | do | do | 34.0 | 38.50 | 2.22 | 86.000 |
| April 19 | do | do | do | 53.6 | 25.58 | 2.70 | 70.000 |
| May 24 | F. R. Steinberger | do | Sec. 14-4-14-3 | 32.0 | 36.40 | 1.50 | 53.000 |
| June 3 | do | do | do | 35.0 | 35.50 | 1.84 | 65.000 |
| June 22 | do | do | do | 26.0 | 20.80 | 2.03 | 43.000 |
| Aug. 18 | do | do | do | 27.0 | 17.10 | 1.42 | 24.000 |
| Aug. 27 | do | do | do | 27.0 | 18.30 | 1.35 | 25.000 |
| Sept. 11 | do | do | do | 29.5 | 21.66 | 1.62 | 35.000 |
| July 31 | do | do | do | 32.5 | 37.27 | 1.40 | 53.000 |
| Mar. 27 | M. H. French | N. Br. Frenchman River | NE. 16-7-22-3 | 8.0 | 5.11 | 2.25 | 11.600 |
| May 1 | F. R. Steinberger | Fireguard Creek | SW. 9-3-11-3 | | | | *b* |
| June 9 | do | Littlebreed Creek | Sec. 2-3-10-3 | *a* | | | 0.140 |
| June 15 | do | do | do | *a* | | | 0.100 |
| July 12 | do | do | do | *a* | | | 0.101 |
| July 19 | do | do | do | *a* | | | 1.060 |
| July 27 | do | do | do | *a* | | | 0.726 |
| Aug. 5 | do | do | do | *a* | | | 0.051 |
| Aug. 12 | do | do | do | | | | *b* |
| June 12 | do | E. Br. McEachran Creek | SE. 6-1-7-3 | | | | *b* |
| April 22 | do | Molestead Coulee | Sec. 12-2-10-3 | | | | Nil. |
| July 30 | do | Mule Creek | SE. 27-5-17-3 | *a* | | | 0.762 |
| Aug. 21 | do | do | do | *a* | | | 0.327 |
| June 10 | do | Ogne Coulee | Sec. 28-1-8-3 | *a* | | | 0.216 |
| June 14 | do | do | do | *a* | | | 0.169 |
| July 19 | do | do | do | *a* | | | 0.126 |
| Aug. 6 | do | do | do | | | | *b* |
| Aug. 11 | do | do | do | | | | *b* |
| April 22 | do | Otter Coulee | SW. 1-2-10-3 | | | | Nil. |
| July 13 | J. E. Caughey | Petrified Coulee | SE. 18-7-22-3 | *a* | | | 0.349 |
| Aug. 4 | do | do | do | *a* | | | 0.303 |
| Aug. 25 | do | do | do | *a* | | | 0.161 |
| Sept. 25 | do | do | do | *a* | | | 0.219 |
| Oct. 14 | do | do | do | *a* | | | 0.180 |
| Oct. 28 | do | do | do | *a* | | | 0.260 |
| May 1 | F. R. Steinberger | Police Creek | NW. 12-4-12-3 | | | | Nil. |
| June 5 | do | do | do | *a* | | | 0.120 |
| June 18 | do | do | do | *a* | | | 0.224 |
| July 9 | do | do | do | *a* | | | 0.193 |
| Aug. 3 | do | do | do | | | | Nil. |
| Aug. 6 | do | do | do | | | | *b* |
| June 2 | do | Shotgun Coulee | NE. 21-4-14-3 | *a* | | | 2.040 |
| July 25 | do | do | Sec. 14-4-11-3 | *a* | | | 0.236 |

*a* Weir measurement. *b* Flow very small. *c* Estimated flow.

## SWIFTCURRENT CREEK DRAINAGE BASIN

*General Description.*

Swiftcurrent Creek rises in the eastern slope of the Cypress Hills, follows a northeasterly course for seventy-five miles and then a northerly one for about twenty-five miles and finally empties into the South Saskatchewan River in Township 20, Range 13, West of 3rd Meridian.

The only important tributary is Bone Creek, which rises in the Cypress Hills and joins the Swiftcurrent in Township 10, Range 19, West of 3rd Meridian.

The main stream flows through a valley, two to three hundred feet deep and a mile wide, to within a few miles of its mouth, where it enters a sandstone gorge, about five hundred feet deep.

The bench land above the creek is of rolling prairie broken by innumerable coulees. The soil is a sandy loam. There is very little tree growth along the stream.

The mean annual rainfall at the town of Swift Current is about fifteen inches. This increases slightly at the stream's headwaters. The greatest precipitation occurs during the months of May, June and July. From November to April the stream is frozen over.

There are a number of small irrigation ditches in this drainage basin, and the town of Swift Current and the Canadian Pacific Railway Company take water for domestic and industrial purposes from the creek.

### D. H. POLLOCK EAST DITCH FROM SWIFTCURRENT CREEK.

*Location.*—On NW. ¼ Sec. 22, Tp. 7, Rge. 21, W. 3rd Mer., about one-quarter mile from point of intake.

*Records available.*—Irrigation seasons 1913–15 and a few discharge measurements from 1909–12.

*Gauge.*—Vertical staff. Zero maintained at elevation of 98.92 feet during 1915.

*Bench-mark.*—Wooden plug. Assumed elevation of 100.00 feet.

*Discharge measurements.*—Made with meter or weir.

*Observer.*—D. H. Pollock.

DISCHARGE MEASUREMENTS of D. H. Pollock East Ditch from Swiftcurrent Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec. ft.* |
| May 18 | J. E. Caughey | ..... | ..... | ..... | ..... | Nil. |
| June 11 | do | 3.0 | 1.07 | 0.87 | 0.58 | 0.91 |
| July 7 | do | 3.0 | 0.90 | 0.74 | 0.58 | 0.66 |
| July 29 | do | ..... | ..... | ..... | ..... | Nil. |

DAILY GAUGE HEIGHT AND DISCHARGE of D. H. Pollock East Ditch from Swiftcurrent Creek, for 1915.

| Day. | June. | | July. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec. ft.* |
| 1 | ..... | ..... | 0.54 | 0.59 |
| 2 | ..... | ..... | 0.54 | 0.59 |
| 3 | 0.67*a* | 1.62 | 0.54 | 0.59 |
| 4 | 0.67 | 1.62 | 0.54 | 0.59 |
| 5 | 0.67 | 1.62 | 0.54 | 0.59 |
| 6 | 0.50 | 0.35 | 0.54 | 0.59 |
| 7 | 0.50 | 0.35 | 0.54 | 0.59 |
| 8 | 0.50 | 0.35 | 0.54 | 0.59 |
| 9 | 0.50 | 0.35 | 0.54 | 0.59 |
| 10 | 0.50 | 0.35 | 0.54 | 0.59 |
| 11 | 0.58 | 0.83 | 0.54 | 0.59 |
| 12 | 0.50 | 0.35 | 0.54 | 0.59 |
| 13 | 0.50 | 0.35 | 0.54 | 0.59 |
| 14 | 0.50 | 0.35 | 0.54 | 0.59 |
| 15 | 0.50 | 0.35 | 0.54 | 0.59 |
| 16 | 0.50 | 0.35 | 0.54*b* | 0.59 |
| 17 | 0.50 | 0.35 | ..... | ..... |
| 18 | 0.50 | 0.35 | ..... | ..... |
| 19 | 0.85 | 3.40 | ..... | ..... |
| 20 | 0.83 | 3.20 | ..... | ..... |
| 21 | 0.75 | 2.40 | ..... | ..... |
| 22 | 0.62 | 1.14 | ..... | ..... |
| 23 | 0.58 | 0.83 | ..... | ..... |
| 24 | 0.56 | 0.71 | ..... | ..... |
| 25 | 0.54 | 0 59 | ..... | ..... |
| 26 | 0.67 | 1.62 | ..... | ..... |
| 27 | 0.54 | 0.59 | ..... | ..... |
| 28 | 0.54 | 0.59 | ..... | ..... |
| 29 | 0.54 | 0.59 | ..... | ..... |
| 30 | 0.62 | 1.14 | ..... | ..... |
| 31 | ..... | ..... | ..... | ..... |

*a* Headgates opened.
*b* Headgates closed.

MONTHLY DISCHARGE of D. H. Pollock East Ditch from Swiftcurrent Creek, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| June (3-30) | 3.40 | 0.35 | 0.95 | 53 |
| July (1-16) | 0.59 | 0.59 | 0.59 | 19 |
| | | | | 72 |

D. H. POLLOCK WEST DITCH FROM SWIFTCURRENT CREEK.

*Location.*—On NW. ¼ Sec. 22, Tp. 7, Rge. 21, W. 3rd Mer.

*Records available.*—Discharge measurements taken in the irrigation season of 1913. Gauge heights during the irrigation season of 1914. J. E. Caughey visited this station on May 18, 1915, and reported no flow.

*Gauge.*—Vertical staff, on the north side of the west end of the flume. Zero elevation 3072.92 feet referred to Canadian Pacific Railway datum.

*Bench-mark.*—Permanent iron bench-mark, situated near the flume. Elevation 3074.89 feet Canadian Pacific Railway datum.

*Channel.*—Flume.

*Discharge measurements.*—Made with meter or weir.

*Observer.*—D. H. Pollock.

SWIFTCURRENT CREEK AT POLLOCK'S RANCH.

*Location.*—On the SW. ¼ Sec. 22, Tp. 7, Rge. 21, W. of the 3rd Meridian.

*Records available.*—May 18, 1909, to October 31, 1915. Two discharge measurements in 1908.

*Gauge.*—Vertical staff. Elevation of zero 1909–12 maintained at 89.25 feet; 1913–15 maintained at 88.75 feet.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Sand and gravel.

*Discharge measurements.*—At high stages by wading; permanent three-foot weir installed in 1914 for measuring the ordinary flow.

*Winter flow.*—Station not maintained during the winter.

*Observer.*—D. H. Pollock.

DISCHARGE MEASUREMENTS of Swiftcurrent Creek at Pollock's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 2 | M. H. French | 5.2 | 4.94 | 1.88 | 4.15 | 9.30 |
| April 8 | do | 4.2 | 5.96 | 0.79 | 1.99 | 4.70 |
| April 16 | do | 4.5 | 2.55 | 0.96 | 1.87 | 2.40 |
| May 18 | J. E. Caughey | 6.1 | 3.75 | 1.00 | 1.91 | 3.80 |
| June 11 | do | ..... | ..... | ..... | 1.45 | 0.94*a* |
| July 7 | do | ..... | ..... | ..... | 1.43 | 0.57*a* |
| July 29 | do | 2.5 | 1.67 | 0.79 | 1.81 | 1.28 |
| Aug. 20 | do | 5.0 | 2.81 | 0.68 | 1.76 | 1.91 |
| Sept. 8 | G. H. Whyte and J. E. Caughey | 2.0 | 1.22 | 0.93 | 1.72 | 1.14 |
| Sept. 21 | J. E. Caughey | ..... | ..... | ..... | 1.71 | 1.32*a* |
| Oct. 11 | do | 2.0 | 1.10 | 1.29 | 1.72 | 1.42 |
| Oct. 26 | do | ..... | ..... | ..... | 1.68 | 1.32*a* |

*a* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Swiftcurrent Creek at Pollock's Ranch, for 1915.

| Day. | April. | | May. | | June. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.63 | 1.42 | 1.73 | 2.31 |
| 2 | 4.15 | 9.30 | 1.62 | 1.40 | 2.12 | 6.26 |
| 3 | 4.75 | 8.53*a* | 1.62 | 1.42 | 1.78 | 2.66 |
| 4 | 4.50 | 7.76 | 1.62 | 1.44 | 1.76 | 2.52 |
| 5 | 2.79 | 7.00 | 1.61 | 1.40 | 1.76 | 2.52 |
| 6 | 2.19 | 6.24 | 1.61 | 1.42 | 1.70 | 2.10 |
| 7 | 2.09 | 5.47*b* | 1.62 | 1.48 | 1.65 | 1.83 |
| 8 | 1.99 | 4.70 | 1.61 | 1.44 | 1.57 | 1.43 |
| 9 | 1.99*b* | 4.58 | 1.61 | 1.46 | 1.55 | 1.34 |
| 10 | 1.99 | 4.44 | 1.60 | 1.42 | 1.52 | 1.21 |
| 11 | 1.99 | 4.30 | 1.61 | 1.50 | 1.45 | 0.96 |
| 12 | 1.99 | 4.16 | 1.62 | 1.58 | 1.45*c* | 0.94 |
| 13 | 2.04 | 4.54 | 1.63 | 1.64 | 1.45 | 0.92 |
| 14 | 1.99 | 3.80 | 1.75 | 2.26 | 1.45 | 0.91 |
| 15 | 1.97 | 3.40 | 2.29 | 8.40 | 1.45 | 0.90 |
| 16 | 1.87 | 2.40 | 2.19 | 7.06 | 1.45 | 0.89 |
| 17 | 1.85 | 2.30 | 1.64*b* | 1.78 | 1.45 | 0.88 |
| 18 | 1.79 | 1.98 | 1.75 | 2.45 | 1.45 | 0.86 |
| 19 | 1.77 | 1.88 | 1.74 | 2.38 | 2.45 | 10.20 |
| 20 | 1.75 | 1.80 | 1.74 | 2.38 | 2.00 | 4.32 |
| 21 | 1.73 | 1.71 | 1.74 | 2.38 | 1.79 | 2.40 |
| 22 | 1.73 | 1.74 | 1.74 | 2.38 | 1.65 | 1.58 |
| 23 | 1.72 | 1.70 | 1.75 | 2.45 | 1.48 | 0.89 |
| 24 | 1.69 | 1.56 | 1.76 | 2.52 | 1.46 | 0.82 |
| 25 | 1.67 | 1.48 | 1.78 | 2.66 | 1.45 | 0.78 |
| 26 | 1.63 | 1.32 | 1.95 | 4.23 | 1.55 | 1.08 |
| 27 | 1.64 | 1.40 | 1.75 | 2.45 | 1.49 | 0.86 |
| 28 | 1.63 | 1.38 | 1.76 | 2.52 | 1.45 | 0.74 |
| 29 | 1.62 | 1.34 | 1.76 | 2.52 | 1.45 | 0.73 |
| 30 | 1.62 | 1.36 | 1.75 | 2.45 | 1.[illegible] | 0.86 |
| 31 | | | 1.72 | 2.24 | | |

*a* to *a* Discharge interpolated.
*b* to *b* and *c* to *c* Shifting conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Swiftcurrent Creek at Pollock's Ranch, for 1915. —*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.49*c* | 0.82 | 1.80 | 1.36 | 1.62 | 1.02 | 1.70 | 1.30 |
| 2 | 1.46 | 0.72 | 1.80 | 1.40 | 1.64 | 1.06 | 1.72 | 1.39 |
| 3 | 1.45 | 0.68 | 1.76 | 1.29 | 1.65 | 1.07 | 1.78 | 1.65 |
| 4 | 1.45 | 0.66 | 1.75 | 1.29 | 1.71 | 1.24 | 1.77 | 1.61 |
| 5 | 1.45 | 0.64 | 1.72 | 1.22 | 1.72 | 1.23 | 1.80 | 1.74 |
| 6 | 1.45*c* | 0.63 | 1.70 | 1.18 | 1.72 | 1.20 | 1.95 | 2.65 |
| 7 | 1.45 | 0.62 | 1.68 | 1.14 | 1.73 | 1.21 | 1.80 | 1.74 |
| 8 | 1.43*d* | 0.57 | 1.65 | 1.07 | 1.73 | 1.15 | 1.75 | 1.52 |
| 9 | 1.45 | 0.62 | 1.65 | 1.10 | 1.74 | 1.22 | 1.75 | 1.52 |
| 10 | 1.47 | 0.66 | 1.65 | 1.13 | 1.75 | 1.28 | 1.90 | 2.30 |
| 11 | 1.50 | 0.70 | 1.64 | 1.12 | 1.75 | 1.30 | 1.80 | 1.74 |
| 12 | 1.52 | 0.76 | 1.65 | 1.19 | 2.00 | 2.65 | 1.75 | 1.52 |
| 13 | 1.55 | 0.82 | 1.65 | 1.21 | 1.90 | 2.04 | 1.73 | 1.43 |
| 14 | 1.55 | 0.81 | 1.65 | 1.24 | 1.90 | 2.06 | 1.71 | 1.34 |
| 15 | 1.47 | 0.84 | 2.00 | 3.34 | 1.85 | 1.82 | 1.71 | 1.34 |
| 16 | 1.47 | 0.83 | 1.90 | 2.62 | 1.79 | 1.56 | 1.70 | 1.30 |
| 17 | 2.15 | 4.10 | 1.65 | 1.33 | 1.75 | 1.42 | 1.70 | 1.30 |
| 18 | 2.10 | 3.60 | 1.65 | 1.36 | 1.73 | 1.36 | 1.70 | 1.30 |
| 19 | 1.85 | 2.04 | 2.00 | 3.60 | 1.72 | 1.34 | 1.70 | 1.30 |
| 20 | 1.84 | 1.68 | 1.76 | 1.91 | 1.72*d* | 1.36 | 1.70 | 1.30 |
| 21 | 1.83 | 1.60 | 1.75 | 1.83 | 1.71 | 1.32 | 1.70 | 1.30 |
| 22 | 1.80 | 1.46 | 1.75 | 1.80 | 1.71 | 1.34 | 1.70 | 1.30 |
| 23 | 2.20 | 4.26 | 1.75 | 1.78 | 1.70 | 1.30 | 1.69 | 1.27 |
| 24 | 2.00 | 2.46 | 1.74 | 1.68 | 1.71 | 1.34 | 1.69 | 1.27 |
| 25 | 1.90 | 1.80 | 1.73 | 1.60 | 1.70 | 1.30 | 1.68 | 1.24 |
| 26 | 1.86 | 1.58 | 1.70 | 1.45 | 1.70 | 1.30 | 1.68 | 1.24 |
| 27 | 1.80 | 1.30 | 1.70 | 1.43 | 1.72 | 1.39 | 1.67 | 1.21 |
| 28 | 1.80 | 1.28 | 1.69 | 1.36 | 1.73 | 1.43 | 1.66 | 1.18 |
| 29 | 1.80 | 1.26 | 1.65 | 1.20 | 1.71 | 1.34 | 1.68 | 1.24 |
| 30 | 1.80 | 1.28 | 1.62 | 1.07 | 1.70 | 1.30 | 1.68 | 1.24 |
| 31 | 1.80 | 1.32 | 1.62 | 1.05 | ..... | ..... | 1.67 | 1.21 |

*c* to *c* and *d* to *d* Shifting conditions.

MONTHLY DISCHARGE of Swiftcurrent Creek at Pollock's Ranch, for 1915.

(Drainage area 16 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| April (2-30) | 9.3 | 1.3 | 3.6 | 0.225 | 0.24 | 207 |
| May | 8.4 | 1.4 | 2.4 | 0.150 | 0.17 | 148 |
| June | 10.2 | 0.7 | 1.9 | 0.119 | 0.13 | 113 |
| July | 4.3 | 0.6 | 1.4 | 0.088 | 0.10 | 86 |
| August | 3.6 | 1.0 | 1.5 | 0.094 | 0.11 | 92 |
| September | 2.6 | 1.0 | 1.4 | 0.088 | 0.10 | 83 |
| October | 2.6 | 1.2 | 1.4 | 0.088 | 0.10 | 86 |
| The period | ..... | ..... | ..... | ..... | 0.95 | 815 |

AXTON DITCH FROM SPPING COULEE.

*Location.*—On NE. ¼ Sec. 26, Tp. 7, Rge. 21, W. 3rd Mer., near South Fork Post Office.
*Records available.*—Gauge heights for the period June 10 to July 9, 1914.
*Gauge.*—Vertical staff. Zero elevation, 3014.01 feet.
*Bench-mark.*—Iron bench-mark. Elevation, 3015.96 feet.
*Observer.*—J. W. E. Axton.
*Remarks.*—J. E. Caughey visited this station on May 18, June 11 and July 7, 1915, and reported no flow on each occasion.

JONES CREEK AT STEARNS' RANCH.

*Location.*—On SE. ¼ Sec. 20, Tp. 8, Rge. 20, W. 3rd Mer.
*Records available.*—May 15, 1912, to September 12, 1915.
*Gauge.*—Vertical staff. Zero maintained at elevation of 93.14 since establishment.
*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.
*Channel.*—Composed of clay and sand.
*Discharge measurements.*—Made by wading or with a weir.
*Winter flow.*—Station not maintained during winter.
*Observer.*—C. E. Stearns.

DISCHARGE MEASUREMENTS of Jones Creek at Stearns' Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 16 | M. H. French | 4.0 | 2.30 | 1.32 | 1.25 | 3.00 |
| May 18 | J. E. Caughey | 5.5 | 5.80 | 0.90 | 1.45 | 5.10 |
| June 10 | do | 5.3 | 2.16 | 1.16 | 0.82 | 2.50 |
| July 6 | do | 5.2 | 1.84 | 0.92 | 0.75 | 1.69 |
| July 28 | do | 5.4 | 2.15 | 0.98 | 0.79 | 2.10 |
| Aug. 19 | do | 2.7 | 1.10 | 0.84 | 0.66 | 0.92 |
| Sept. 8 | G. H. Whyte and J. E. Caughey | 5.3 | 1.46 | 0.58 | 0.67 | 0.85 |
| Sept. 21 | J. E. Caughey | ..... | ..... | ..... | 0.64 | 0.60*a* |
| Oct. 11 | do | ..... | ..... | ..... | 0.70 | 1.36*a* |
| Oct. 26 | do | ..... | ..... | ..... | 0.64 | 0.60*a* |

*a* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Jones Creek at Stearns' Ranch, for 1915.

| Day. | March. | | April. | | May. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | .. | .. | 5.00*a* | 3.00 | 0.76 | 0.56 |
| 2 | .. | .. | 4.96 | 4.00 | 0.74 | 0.50 |
| 3 | | | 4.76 | 5.00 | 0.72*a* | 0.45 |
| 4 | | | 4.76 | 6.00 | 0.71 | 0.4[illegible] |
| 5 | | | 4.00*a* | 8.00 | 0.70 | 0.40 |
| 6 | | | 3.13 | 10.00*a* | 0.69*a* | [illegible] |
| 7 | | | 2.80*a* | 24.00 | 0.68 | [illegible] |
| 8 | | | 2.51 | 20.00 | 0.68 | 0.36 |
| 9 | | | 2.11 | 15.00 | 0.67*a* | [illegible] |
| 10 | | | 1.96 | 12.70 | 0.66 | 0.[illegible] |
| 11 | | | 1.95*a* | 12.60 | 0.64 | 0.2[illegible] |
| 12 | | | 1.93*a* | 12.20 | 0.64 | 0.2[illegible] |
| 13 | | | 1.91 | 12.00 | 0.80*a* | [illegible] |
| 14 | | | 1.43 | 4.80 | 2.13 | 15.[illegible] |
| 15 | | | 1.35*a* | 3.90 | 2.75 | 24.[illegible] |
| 16 | | | 1.25 | 3.00 | 2.[illegible]*a* | 17.[illegible] |
| 17 | | | 1.20 | 2.60 | 1.70*a* | 8.8[illegible] |
| 18 | | | 1.17 | 2.40 | 1.45 | 5.1[illegible] |
| 19 | | | 1.10*a* | 1.94 | 1.2[illegible] | 2.8[illegible] |
| 20 | | | 1.04 | 1.62 | 1.04 | 1.[illegible] |
| 21 | | | 1.00 | 1.40 | 1.00*a* | 1.40 |
| 22 | | | 0.97 | 1.28 | 0.[illegible] | 1.2[illegible] |
| 23 | 6.32 | 1.00*b* | 0.95*a* | 1.20 | 0.90*a* | 1.[illegible] |
| 24 | 5.37 | 1.00 | 0.92 | 1.08 | 0.8[illegible] | 0.8[illegible] |
| 25 | 5.15*a* | 2.00 | 0.85 | 0.83 | 1.0[illegible]*a* | 1.4[illegible] |
| 26 | 5.00*a* | 2.00 | 0.82*a* | 0.73 | 1.52 | [illegible].10 |
| 27 | 5.00*a* | 2.00 | 0.79 | 0.63 | 1.0[illegible]*a* | 1.4[illegible] |
| 28 | 5.00*a* | 2.00 | 0.78*a* | 0.61 | 0.80 | [illegible] |
| 29 | 5.00*a* | 2.00 | 0.77 | 0.58 | 0.80 | 1.[illegible] |
| 30 | 5.00*a* | 2.00 | 0.77 | 0.58 | 0.92 | 1.08 |
| 31 | 5.00*a* | 2.00 | | | 0.93 | 1.2[illegible] |

*a* Gauge height interpolated.
*b* to *c* Ice conditions, discharge estimated.

DAILY GAUGE HEIGHT AND DISCHARGE of Jones Creek at Stearns' Ranch, for 1915.—*Concluded.*

| Day. | June. | | July. | | August. | | September. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.00*a* | 13.30 | 0.85*a* | 2.80 | 0.75 | 1.70 | 0.60 | 0.50 |
| 2 | 2.50 | 26.00 | 0.81 | 2.30 | 0.73 | 1.50 | 0.59 | 0.46 |
| 3 | 2.35 | 24.00 | 0.80 | 2.20 | 0.70 | 1.20 | 0.60*a* | 0.50 |
| 4 | 1.64 | 13.70 | 0.80 | 2.20 | 0.70*a* | 1.20 | 0.61*a* | 0.57 |
| 5 | 1.28 | 8.60 | 0.77*a* | 1.90 | 0.69*a* | 1.13 | 0.62*a* | 0.64 |
| 6 | 1.10*a* | 6.10 | 0.75 | 1.70 | 0.68 | 1.06 | 0.63*a* | 0.71 |
| 7 | 0.98 | 4.40 | 1.02 | 5.00 | 0.68 | 1.06 | 0.64*a* | 0.78 |
| 8 | 0.90*a* | 3.40 | 0.90*a* | 3.40 | 0.67 | 0.99 | 0.65*a* | 0.85 |
| 9 | 0.82 | 2.40 | 0.80 | 2.20 | 0.66 | 0.92 | 0.66 | 0.92 |
| 10 | 0.82 | 2.40 | 0.80 | 2.20 | 0.65 | 0.85 | 0.66 | 0.92 |
| 11 | 0.80 | 2.20 | 0.78*a* | 2.00 | 0.65 | 0.85 | 0.67 | 0.99 |
| 12 | 0.79*a* | 2.10 | 0.75 | 1.70 | 0.65*a* | 0.85 | 0.68*b* | 1.06 |
| 13 | 0.78 | 2.00 | 0.75 | 1.70 | 0.65*a* | 0.85 | ..... | ..... |
| 14 | 0.85 | 2.80 | 0.95 | 4.00 | 0.65 | 0.85 | ..... | ..... |
| 15 | 0.85*a* | 2.40 | 0.90 | 3.40 | 0.65 | 0.85 | ..... | ..... |
| 16 | 0.80 | 2.20 | 0.87 | 3.00 | 0.65 | 0.85 | ..... | ..... |
| 17 | 0.80 | 2.20 | 0.95*a* | 4.00 | 0.64 | 0.78 | ..... | ..... |
| 18 | 0.79 | 2.10 | 1.00 | 4.70 | 0.65*a* | 0.85 | ..... | ..... |
| 19 | 3.30 | 37.00 | 0.87 | 3.00 | 0.66 | 0.92 | ..... | ..... |
| 20 | 3.50 | 40.00 | 0.78 | 2.00 | 0.65*a* | 0.85 | ..... | ..... |
| 21 | 2.00*a* | 18.70 | 0.75 | 1.70 | 0.65 | 0.85 | ..... | ..... |
| 22 | 1.30 | 8.90 | 0.73 | 1.50 | 0.65*a* | 0.85 | ..... | ..... |
| 23 | 1.01 | 4.80 | 0.85*a* | 2.80 | 0.64*a* | 0.78 | ..... | ..... |
| 24 | 0.90 | 3.40 | 1.00 | 4.70 | 0.64 | 0.78 | ..... | ..... |
| 25 | 0.95*a* | 4.00 | 0.98 | 4.40 | 0.64 | 0.78 | ..... | ..... |
| 26 | 1.01 | 4.80 | 0.90 | 3.40 | 0.63*a* | 0.71 | ..... | ..... |
| 27 | 0.98 | 4.40 | 0.85*a* | 2.80 | 0.63 | 0.71 | ..... | ..... |
| 28 | 0.95 | 4.00 | 0.79 | 2.10 | 0.62 | 0.64 | ..... | ..... |
| 29 | 0.90 | 3.40 | 0.77 | 1.90 | 0.62 | 0.64 | ..... | ..... |
| 30 | 0.90*a* | 3.40 | 0.77 | 1.90 | 0.61*a* | 0.57 | ..... | ..... |
| 31 | ..... | ..... | 0.76 | 1.80 | 0.60 | 0.50 | ..... | ..... |

*a* Gauge height interpolated.
*b* No gauge height observations after this date.

MONTHLY DISCHARGE of Jones Creek at Stearns' Ranch, for 1915.

(Drainage area 23 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (23-31) | 2.00 | 1.00 | 1.78 | 0.077 | 0.03 | 32 |
| April | 24.00 | 0.58 | 5.80 | 0.252 | 0.28 | 345 |
| May | 24.00 | 0.28 | 3.00 | 0.130 | 0.15 | 184 |
| June | 40.00 | 2.00 | 8.60 | 0.374 | 0.42 | 512 |
| July | 5.00 | 1.50 | 2.70 | 0.117 | 0.14 | 166 |
| August | 1.70 | 0.50 | 0.90 | 0.039 | 0.04 | 55 |
| September (1-12) | 1.06 | 0.46 | 0.74 | 0.032 | 0.01 | 17 |
| The period | ..... | ..... | ..... | ..... | 1.07 | 1,311 |

## Monthly Discharge of Jones Creek at Stearns' Ranch, for 1914.

(Drainage area 23 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| April | 18.20 | 2.10 | 6.93 | 0.301 | 0.34 | 412 |
| May | 2.30 | 0.88 | 1.77 | 0.077 | 0.09 | 109 |
| June | 2.50 | 0.34 | 1.12 | 0.049 | 0.05 | 67 |
| July | 0.51 | 0.00 | 0.13 | 0.005 | 0.01 | 8 |
| August | ..... | ..... | ..... | ..... | ..... | Nil. |
| September | ..... | ..... | ..... | ..... | ..... | " |
| October | ..... | ..... | ..... | ..... | ..... | " |
| The period | ..... | ..... | ..... | ..... | 0.49 | 596 |

Note.—This table is inserted in this report to correct a table which was published on page 401 of the report for 1914.

STEARNS BROS. SOUTH DITCH NEAR LEITCHVILLE.

*Location.*—On SW. ¼ Sec. 9, Tp. 9, Rge. 20, W. 3rd Mer.

*Gauge.*—Vertical staff just above weir. Elevation of zero of gauge maintained at 110.83 feet since establishment. Elevation of crest of weir maintained at 111.39 feet since establishment.

*Bench-mark.*—One bench-mark used for both north and south ditches; seven-eighths inch iron pin located four feet to the right and two feet above the weir in the north ditch. Assumed elevation, 100.00 feet.

*Channel.*—One, heavy loam bed.

*Discharge measurements.*—Made by a weir.

*Observer.*—Stearns Bros.

*Remarks.*—This station was established by M. Gurofsky on July 21, 1915. No records were obtained in 1915.

STEARNS BROS. NORTH DITCH NEAR LEITCHVILLE.

*Location.*—On SW. ¼ Sec. 9, Tp. 9, Rge. 20, W. 3rd Mer.

*Gauge.*—Vertical staff just above weir. Elevation of zero maintained at 98.67 feet since establishment. Elevation of crest of weir maintained at 99.14 feet since establishment.

*Bench-mark.*—Seven-eighths inch iron pin, located four feet to the right and two feet above the weir. Assumed elevation, 100.00 feet.

*Channel.*—One, heavy loam bed.

*Discharge measurements.*—Made by a weir.

*Observer.*—Stearns Bros.

*Remarks.*—This station was established July 21, 1915, by M. Gurofsky. No records were obtained in 1915.

SINCLAIR SOUTH DITCH NEAR GULL LAKE.

*Location.*—On SE. ¼ Sec. 18, Tp. 10, Rge. 19, W. 3rd Mer.

*Gauge.*—Vertical staff, situated on the right side of the ditch and 300 feet below the headgate. Zero elevation maintained at 97.72 feet since establishment. Elevation of crest of weir maintained at 98.32 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark four feet to the right and two feet above the weir. Assumed elevation, 100.00 feet.

*Channel.*—One channel at all stages, clay loam bed.

*Discharge measurements.*—Made by a weir.

*Observer.*—K. Sinclair.

*Remarks.*—This station was established on July 22, 1915, by M. H. French. No records were obtained in 1915.

SWIFTCURRENT CREEK AT SINCLAIR'S RANCH (UPPER STATION).

*Location.*—On the NE. ¼ Sec. 18, Tp. 10, Rge. 19, W. 3rd Mer., above the mouth of Bone Creek.

*Records available.*—June 15, 1910, to October 31, 1915.

*Gauge.*—Vertical staff. Zero was maintained at 87.91 feet during 1910–11 and at 87.86 feet during 1912–15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Permanent.

*Discharge measurements.*—Made with meter, and by weir at low stages.

*Winter flow.*—This station is not maintained during the winter.

*Diversions.*—Messrs. D. H. Pollock and J. W. E. Axton divert water for irrigation purposes above this station.

*Observer.*—Mrs. K. Sinclair.

*Remarks.*—Records at this station are affected by backwater from Bone Creek at certain stages of that stream.

DISCHARGE MEASUREMENTS of Swiftcurrent Creek at Sinclair's Ranch (Upper Station), in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 17 | M. H. French | 14.0 | 13.92 | 1.33 | 1.25 | 18.60 |
| May 19 | J. E. Caughey | 13.5 | 15.55 | 1.42 | 1.41 | 22.00 |
| June 9 | do | 10.5 | 9.39 | 1.48 | 0.92 | 13.90 |
| June 29 | do | 10.2 | 11.34 | 1.40 | 1.17 | 16.00 |
| July 26 | do | 12.5 | 9.45 | 0.67 | 0.90 | 6.40 |
| Aug. 18 | do | 10.5 | 3.70 | 0.49 | 0.51 | 1.82 |
| Sept. 6 | G. H. Whyte and J. E. Caughey | 11.0 | 4.13 | 0.53 | 0.56 | 2.20 |
| Sept. 20 | J. E. Caughey | 11.5 | 6.15 | 0.67 | 0.72 | 4.10 |
| Oct. 9 | do | 13.0 | 7.75 | 0.71 | 0.86 | 5.50 |
| Oct. 25 | do | 11.0 | 2.87 | 1.04 | 0.64 | 3.00 |

DAILY GAUGE HEIGHT AND DISCHARGE of Swiftcurrent Creek at Sinclair's Ranch (Upper Station), for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 5.00 | ..... | 0.51 | 7.1 | 0.73 | 9.8 |
| 2 | ..... | ..... | 5.25 | ..... | 0.50 | 7.0 | 0.76 | 10.2 |
| 3 | ..... | ..... | 5.65 | ..... | 0.49 | 6.9 | 0.98 | 13.5 |
| 4 | ..... | ..... | 6.00 | ..... | 0.49 | 6.9 | 1.01 | 14.0 |
| 5 | ..... | ..... | 5.25 | ..... | 0.48 | 6.8 | 1.13 | 16.1 |
| 6 | ..... | ..... | 4.75 | ..... | 0.50 | 7.0 | 1.21 | 17.7 |
| 7 | ..... | ..... | 4.60 | ..... | 0.50 | 7.0 | 1.27 | 19.0 |
| 8 | ..... | ..... | 4.40 | ..... | 0.50 | 7.0 | 0.99 | 13.6 |
| 9 | ..... | ..... | 4.00 | ..... | 0.50 | 7.0 | 0.92 | 12.5 |
| 10 | ..... | ..... | 3.25 | ..... | 0.51 | 7.1 | 0.92 | 12.5 |
| 11 | ..... | ..... | 2.75 | ..... | 0.51 | 7.1 | 0.91 | 12.4 |
| 12 | ..... | ..... | 2.355 | ..... | 0.52 | 7.2 | 0.88 | 11.9 |
| 13 | ..... | ..... | 1.55 | 27.0 | 0.54 | 7.4 | 0.84 | 11.4 |
| 14 | ..... | ..... | 1.50 | 25.0 | 1.25 | 18.6 | 0.77 | 10.4 |
| 15 | ..... | ..... | 1.50 | 25.0 | 2.75 | 75.0 | 0.73 | 9.8 |
| 16 | ..... | ..... | 1.48 | 25.0 | 4.65 | 151.0 | 0.70 | 9.4 |
| 17 | ..... | ..... | 1.25 | 18.6 | 4.54 | 147.0 | 0.70 | 9.4 |
| 18 | ..... | ..... | 1.23 | 18.1 | 2.55 | 67.0 | 0.71 | 9.5 |
| 19 | ..... | ..... | 1.20 | 17.5 | 1.45 | 24.0 | 0.78 | 10.5 |
| 20 | ..... | ..... | 1.18 | 17.1 | 1.26 | 18.8 | 2.00 | 45.0 |
| 21 | ..... | ..... | 1.05 | 14.6 | 1.26 | 18.8 | 2.30 | 57.0 |
| 22 | ..... | ..... | 0.97 | 13.3 | 1.24 | 18.3 | 2.22 | 54.0 |
| 23 | ..... | ..... | 0.75 | 10.1 | 1.20 | 17.5 | 2.00 | 45.0 |
| 24 | ..... | ..... | 0.67 | 9.0 | 1.22 | 17.9 | 1.98 | 44.0 |
| 25 | ..... | ..... | 0.68 | 9.1 | 1.29 | 19.4 | 2.00 | 45.0 |
| 26 | ..... | ..... | 0.70 | 9.4 | 1.20 | 17.5 | 2.10 | 49.0 |
| 27 | ..... | ..... | 0.64 | 8.6 | 1.00 | 13.8 | 2.11 | 49.0 |
| 28 | ..... | ..... | 0.58 | 7.8 | 0.98 | 13.5 | 1.70 | 33.0 |
| 29 | 6.75*a* | ..... | 0.56 | 7.6 | 0.88 | 11.9 | 1.17 | 16.9 |
| 30 | 6.25 | ..... | 0.53 | 7.3 | 0.81 | 10.9 | 1.20 | 17.5 |
| 31 | 6.00 | ..... | ..... | ..... | 0.76 | 10.2 | ..... | ..... |

*a* to *b* Ice conditions and affected by backwater from Bone Creek.

DAILY GAUGE HEIGHT AND DISCHARGE of Swiftcurrent Creek at Sinclair's Ranch (Upper Station), for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.25 | 18.6 | 0.75 | 4.20 | 0.35 | 1.00 | 0.62 | 2.80 |
| 2 | 1.28 | 19.2 | 0.74 | 4.10 | 0.50 | 1.90 | 0.63 | 2.90 |
| 3 | 1.57 | 28.0 | 0.74 | 4.10 | 0.69 | 3.50 | 0.81 | 4.90 |
| 4 | 1.25 | 18.5 | 0.68 | 3.40 | 0.70 | 3.60 | 0.95 | 7.00 |
| 5 | 1.00 | 13.8 | 0.66 | 3.20 | 0.68 | 3.40 | 0.94 | 6.90 |
| 6 | 3.00 | 64.0 | 0.65 | 3.10 | 0.56 | 2.30 | 0.94 | 6.90 |
| 7 | 2.89 | 61.0 | 0.65 | 3.10 | 0.54 | 2.20 | 0.95 | 7.00 |
| 8 | 2.50 | 49.0 | 0.64 | 3.00 | 0.53 | 2.10 | 0.86 | 5.60 |
| 9 | 2.00 | 34.0 | 0.62 | 2.80 | 0.52 | 2.00 | 0.86 | 5.60 |
| 10 | 1.30 | 14.0 | 0.60 | 2.60 | 0.53 | 2.10 | 0.71 | 3.70 |
| 11 | 1.00 | 7.9 | 0.60 | 2.60 | 0.54 | 2.20 | 0.69 | 3.50 |
| 12 | 0.92 | 6.5 | 0.59 | 2.50 | 0.56 | 2.30 | 0.68 | 3.40 |
| 13 | 0.85 | 5.5 | 0.59 | 2.50 | 0.62 | 2.80 | 0.67 | 3.30 |
| 14 | 0.88 | 5.9 | 0.59 | 2.50 | 0.76 | 4.30 | 0.59 | 2.50 |
| 15 | 0.85 | 5.5 | 0.57 | 2.40 | 0.79 | 4.70 | 0.60 | 2.60 |
| 16 | 0.81 | 4.9 | 0.53 | 2.10 | 0.77 | 4.40 | 0.57 | 2.40 |
| 17 | 0.89 | 6.1 | 0.50 | 1.90 | 0.72 | 3.80 | 0.55 | 2.20 |
| 18 | 0.91 | 6.4 | 0.48 | 1.76 | 0.70 | 3.60 | 0.52 | 2.00 |
| 19 | 1.14 | 10.5 | 0.49 | 1.83 | 0.70 | 3.60 | 0.50 | 1.90 |
| 20 | 0.97 | 7.4 | 0.47 | 1.69 | 0.71 | 3.70 | 0.50 | 1.90 |
| 21 | 0.89 | 6.1 | 0.45 | 1.55 | 0.72 | 3.80 | 0.49 | 1.83 |
| 22 | 0.85 | 5.5 | 0.45 | 1.55 | 0.76 | 3.60 | 0.49 | 1.83 |
| 23 | 0.82 | 5.1 | 0.44 | 1.48 | 0.69 | 3.50 | 0.56 | 2.30 |
| 24 | 0.82 | 5.1 | 0.40 | 1.20 | 0.67 | 3.30 | 0.56 | 2.30 |
| 25 | 0.84 | 5.4 | 0.41 | 1.27 | 0.65 | 3.10 | 0.62 | 2.80 |
| 26 | 0.90 | 6.2 | 0.40 | 1.20 | 0.65 | 3.10 | 0.66 | 3.20 |
| 27 | 0.89 | 6.1 | 0.37 | 1.08 | 0.66 | 3.20 | 0.65 | 3.10 |
| 28 | 0.85 | 5.5 | 0.36 | 1.04 | 0.65 | 3.10 | 0.67 | 3.30 |
| 29 | 0.82 | 5.1 | 0.36 | 1.04 | 0.64 | 3.00 | 0.66 | 3.20 |
| 30 | 0.80 | 4.8 | 0.37 | 1.08 | 0.64 | 3.00 | 0.65 | 3.10 |
| 31 | 0.75 | 4.2 | 0.36 | 1.04 | ..... | ..... | 0.64 | 3.00 |

MONTHLY DISCHARGE of Swiftcurrent Creek at Sinclair's Ranch (Upper Station), for 1915.

(Drainage area 172 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| April (13-30) | 27.0 | 7.30 | 15.00 | 0.087 | 0.580 | 535 |
| May | 151.0 | 6.80 | 25.00 | 1.450 | 1.670 | 1,537 |
| June | 57.0 | 9.40 | 23.00 | 1.330 | 0.148 | 1,769 |
| July | 64.0 | 4.20 | 14.40 | 0.084 | 0.180 | 885 |
| August | 4.2 | 1.04 | 2.22 | 0.013 | 0.020 | 136 |
| September | 4.7 | 1.00 | 3.07 | 0.018 | 0.020 | 187 |
| October | 7.0 | 1.83 | 3.51 | 0.020 | 0.020 | 216 |
| The period | | | | | 2.638 | 4,861 |

LEWIS DITCH AT KLINTONEL.

*Location.*—On NW. ¼ Sec. 34, Tp. 8, Rge. 22, W. 3rd Mer., about one thousand feet below the headgate.

*Records available.*—August 20, 1915, to September 11, 1915.

*Gauge.*—Staff fastened to a post at the left bank. Zero elevation maintained at 94.25 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark on the right bank about eight feet southeast of the gauge. Assumed elevation, 100.00 feet.

*Discharge measurements.*—Made by meter at the section, or by weir in the ditch.

*Observer.*—C. L. Lewis.

*Remarks.*—This ditch takes its supply from a spring which enters Bone Creek above the gauging station.

DISCHARGE MEASUREMENTS of Lewis Ditch at Klintonel, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Aug. 24 | J. E. Caughey | ..... | ..... | .....*a* | 0.26 | 0.079*a* |

*a* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Lewis Ditch at Klintonel, for 1915.

| Day. | August. | | September. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 0.21 | 0.02 |
| 2 | ..... | ..... | 0.26 | 0.07 |
| 3 | ..... | ..... | 0.21 | 0.02 |
| 4 | ..... | ..... | 0.22 | 0.03 |
| 5 | ..... | ..... | 0.22 | 0.03 |
| 6 | ..... | ..... | 0.21 | 0.02 |
| 7 | ..... | ..... | 0.26 | 0.07 |
| 8 | ..... | ..... | 0.24 | 0.05 |
| 9 | ..... | ..... | 0.26 | 0.07 |
| 10 | ..... | ..... | 0.25 | 0.06 |
| 11 | ..... | ..... | 0.28 | 0.11 |
| 12 | ..... | ..... | ..... | .....*b* |
| 13 | ..... | ..... | ..... | ..... |
| 14 | ..... | ..... | ..... | ..... |
| 15 | ..... | ..... | ..... | ..... |
| 16 | ..... | ..... | ..... | ..... |
| 17 | ..... | ..... | ..... | ..... |
| 18 | ..... | ..... | ..... | ..... |
| 19 | ..... | ..... | ..... | ..... |
| 20 | 0.21 | 0.02*a* | ..... | ..... |
| 21 | 0.21 | 0.02 | ..... | ..... |
| 22 | 0.21 | 0.02 | ..... | ..... |
| 23 | 0.21 | 0.02 | ..... | ..... |
| 24 | 0.23 | 0.04 | ..... | ..... |
| 25 | 0.25 | 0.06 | ..... | ..... |
| 26 | 0.22 | 0.03 | ..... | ..... |
| 27 | 0.21 | 0.02 | ..... | ..... |
| 28 | 0.25 | 0.06 | ..... | ..... |
| 29 | 0.20 | 0.01 | ..... | ..... |
| 30 | 0.20 | 0.01 | ..... | ..... |
| 31 | 0.20 | 0.01 | ..... | ..... |

*a* Headgate opened.
*b* Headgate closed.

MONTHLY DISCHARGE of Lewis Ditch at Klintonel, for 1915.

| MONTH. | DISCHARGE IN SECOND-FEET. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| August (20–31) | 0.06 | 0.01 | 0.03 | 0.70 |
| September (1–11) | 0.11 | 0.02 | 0.05 | 1.00 |
| The period | ..... | ..... | ..... | 1.70 |

BONE CREEK AT LEWIS' RANCH.

*Location.*—On the NW. ¼ Sec. 34, Tp. 8, Rge. 22, W. 3rd Mer., at Klintonel Post Office.
*Records available.*—July 1, 1908, October 31, 1915.
*Gauge.*—Vertical staff. The elevation of the zero has been maintained at 95.02 feet since establishment.
*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.
*Channel.*—Slightly shifting.
*Discharge measurements.*—Made with meter, or with weir at low stages.
*Winter flow.*—This station is not maintained during the winter.
*Observer.*—C. L. Lewis.

DISCHARGE MEASUREMENTS of Bone Creek at Lewis' Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 6 | J. E. Caughey | 9.0 | 2.10 | 0.76 | 0.17 | 1.590 |
| June 15 | do | 8.8 | 2.38 | 0.74 | 0.20 | 1.770 |
| July 12 | do | 6.0 | 1.44 | 0.77 | 0.16 | 1.110 |
| Aug. 4 | do | 9.0 | 2.12 | 0.61 | 0.17 | 1.290 |
| Aug. 24 | do | ..... | ..... | ..... | 0.14 | 0.836a |
| Sept. 12 | G. H. Whyte and J. E. Caughey | ..... | ..... | ..... | 0.19 | 1.455a |
| Sept. 24 | J. E. Caughey | ..... | ..... | ..... | 0.18 | 1.407a |
| Oct. 13 | do | ..... | ..... | ..... | 0.21 | 1.750a |

a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Bone Creek at Lewis' Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 0.16 | 1.08 | 0.15 | 0.96 | 0.24 | 2.40 |
| 2 | ..... | ..... | 0.48 | 7.00 | 0.14 | 0.85 | 0.38 | 5.10 |
| 3 | ..... | ..... | 1.98 | 36.00 | 0.13 | 0.74 | 0.40 | 5.40 |
| 4 | ..... | ..... | 1.54 | 27.00 | 0.12 | 0.64 | 0.29 | 3.40 |
| 5 | ..... | ..... | 1.38 | 24.00 | 0.11 | 0.54 | 0.30 | 3.60 |
| 6 | ..... | ..... | 0.49 | 7.20 | 0.17 | 1.22 | 0.21 | 1.84 |
| 7 | ..... | ..... | 0.29 | 3.40 | 0.18 | 1.36 | 0.19 | 1.51 |
| 8 | ..... | ..... | 0.31 | 3.70 | 0.18 | 1.36 | 0.19 | 1.51 |
| 9 | ..... | ..... | 0.29 | 3.40 | 0.17 | 1.22 | 0.18 | 1.36 |
| 10 | ..... | ..... | 0.27 | 3.00 | 0.17 | 1.22 | 0.22 | 2.00 |
| 11 | ..... | ..... | 0.25 | 2.60 | 0.17 | 1.22 | 0.20 | 1.67 |
| 12 | 0.14 | 0.85 | 0.23 | 2.20 | 0.17 | 1.22 | 0.21 | 1.84 |
| 13 | 0.14 | 0.85 | 0.22 | 2.00 | 0.17 | 1.22 | 0.18 | 1.36 |
| 14 | 0.14 | 0.85 | 0.22 | 2.00 | 0.62 | 9.70 | 0.21 | 1.84 |
| 15 | 0.14 | 0.85 | 0.22 | 2.00 | 0.51 | 7.50 | 0.20 | 1.67 |
| 16 | 0.14 | 0.85 | 0.21 | 1.84 | 0.36 | 4.70 | 0.19 | 1.51 |
| 17 | 0.15 | 0.96 | 0.21 | 1.84 | 0.24 | 2.40 | 0.20 | 1.67 |
| 18 | 0.15 | 0.96 | 0.19 | 1.51 | 0.21 | 1.84 | 0.19 | 1.51 |
| 19 | 0.15 | 0.96 | 0.19 | 1.51 | 0.19 | 1.51 | 0.21 | 1.84 |
| 20 | 0.15 | 0.96 | 0.19 | 1.51 | 0.19 | 1.51 | 0.32 | 3.90 |
| 21 | 0.16 | 1.08 | 0.19 | 1.51 | 0.19 | 1.51 | 0.21 | 1.84 |
| 22 | 0.16 | 1.08 | 0.18 | 1.36 | 0.20 | 1.67 | 0.20 | 1.67 |
| 23 | 0.16 | 1.08 | 0.18 | 1.36 | 0.21 | 1.84 | 0.18 | 1.36 |
| 24 | 0.14 | 0.85 | 0.18 | 1.36 | 0.26 | 2.80 | 0.16 | 1.08 |
| 25 | 0.12 | 0.64 | 0.17 | 1.22 | 0.38 | 5.10 | 0.16 | 1.08 |
| 26 | 0.12 | 0.64 | 0.17 | 1.22 | 0.21 | 1.84 | 0.28 | 3.20 |
| 27 | 0.12 | 0.64 | 0.17 | 1.22 | 0.19 | 1.51 | 0.19 | 1.51 |
| 28 | 0.11 | 0.54 | 0.17 | 1.22 | 0.19 | 1.51 | 0.18 | 1.36 |
| 29 | 0.12 | 0.64 | 0.16 | 1.08 | 0.19 | 1.51 | 0.17 | 1.22 |
| 30 | 0.12 | 0.64 | 0.16 | 1.08 | 0.19 | 1.51 | 0.34 | 4.30 |
| 31 | 0.12 | 0.64 | ..... | ..... | 0.19 | 1.51 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Bone Creek at Lewis' Ranch, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 0.18 | 1.36 | 0.17 | 1.22 | 0.15 | 0.96 | 0.45 | 1.41 |
| 2 | 0.16 | 1.08 | 0.16 | 1.08 | 0.19 | 1.51 | 0.47 | 1.50 |
| 3 | 0.18 | 1.36 | 0.15 | 0.96 | 0.15 | 0.96 | 0.50 | 1.65 |
| 4 | 0.17 | 1.22 | 0.16 | 1.08 | 0.18 | 1.36 | 0.41 | 1.26 |
| 5 | 0.16 | 1.08 | 0.14 | 0.85 | 0.22 | 2.00 | 0.56*c* | 1.94 |
| 6 | 0.16 | 1.08 | 0.14 | 0.85 | 0.14 | 0.85 | 0.21 | 1.84 |
| 7 | 0.18 | 1.36 | 0.15 | 0.96 | 0.18 | 1.36 | 0.22 | 2.00 |
| 8 | 0.34 | 4.30 | 0.14 | 0.85 | 0.17 | 1.22 | 0.22 | 2.00 |
| 9 | 0.19 | 1.51 | 0.13 | 0.74 | 0.18 | 1.36 | 0.21 | 1.84 |
| 10 | 0.21 | 1.84 | 0.12 | 0.64 | 0.17 | 1.22 | 0.52*b* | 1.75 |
| 11 | 0.16 | 1.08 | 0.11 | 0.54 | 0.18 | 1.36 | 0.51 | 1.70 |
| 12 | 0.16 | 1.08 | 0.11 | 0.54 | 0.19 | 1.51 | 0.53 | 1.80 |
| 13 | 0.19 | 1.51 | 0.15 | 0.96 | 0.54*b* | 1.85 | 0.50 | 1.65 |
| 14 | 0.18*a* | 1.36 | 0.17 | 1.22 | 0.53 | 1.80 | 0.20 | 1.67 |
| 15 | 0.17 | 1.22 | 0.15 | 0.96 | 0.46 | 1.46 | 0.22 | 2.00 |
| 16 | 0.19 | 1.51 | 0.12 | 0.64 | 0.41 | 1.26 | 0.22 | 2.00 |
| 17 | 0.23 | 2.20 | 0.14 | 0.85 | 0.40 | 1.22 | 0.23 | 2.20 |
| 18 | 0.20 | 1.67 | 0.14 | 0.85 | 0.42 | 1.27 | 0.23 | 2.20 |
| 19 | 0.17 | 1.22 | 0.15 | 0.96 | 0.48 | 1.55 | 0.23 | 2.20 |
| 20 | 0.16 | 1.08 | 0.17 | 1.22 | 0.42 | 1.27 | 0.23 | 2.20 |
| 21 | 0.15 | 0.96 | 0.17 | 1.22 | 0.41 | 1.26 | 0.24 | 2.40 |
| 22 | 0.15 | 0.96 | 0.14 | 0.85 | 0.40 | 1.22 | 0.25 | 2.60 |
| 23 | 0.21 | 1.84 | 0.13 | 0.74 | 0.40 | 1.22 | 0.24 | 2.40 |
| 24 | 0.21 | 1.84 | 0.14 | 0.85 | 0.43 | 1.32 | 0.23 | 2.20 |
| 25 | 0.19 | 1.51 | 0.14 | 0.85 | 0.41 | 1.36 | 0.23 | 2.20 |
| 26 | 0.18 | 1.36 | 0.13 | 0.74 | 0.44 | 1.36 | 0.23 | 2.20 |
| 27 | 0.17 | 1.22 | 0.13 | 0.74 | 0.46 | 1.46 | 0.23 | 2.20 |
| 28 | 0.21 | 1.84 | 0.16 | 1.08 | 0.45 | 1.41 | 0.22 | 2.00 |
| 29 | 0.20 | 1.67 | 0.12 | 0.64 | 0.44 | 1.36 | 0.22 | 2.00 |
| 30 | 0.17 | 1.22 | 0.12 | 0.64 | 0.44 | 1.36 | 0.22 | 2.00 |
| 31 | 0.19 | 1.51 | 0.12 | 0.64 | ..... | ..... | 0.22 | 2.00 |

*a* Gauge heights interpolated.
*b* to *c* Head on 18 ′ rectangular weir.

MONTHLY DISCHARGE of Bone Creek at Lewis' Ranch, for 1915.

(Drainage area 17 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area | Total in Acre-feet. |
| March (12-31) | 1.08 | 0.64 | 0.83 | 0.049 | 0.04 | 33 |
| April | 36.00 | 1.08 | 4.90 | 0.288 | 0.32 | 292 |
| May | 9.70 | 0.54 | 2.10 | 0.124 | 0.14 | 129 |
| June | 5.40 | 1.08 | 2.20 | 0.129 | 0.14 | 131 |
| July | 4.30 | 0.96 | 1.50 | 0.088 | 0.10 | 92 |
| August | 1.22 | 0.54 | 0.87 | 0.051 | 0.06 | 53 |
| September | 2.00 | 0.85 | 1.37 | 0.081 | 0.09 | 82 |
| October | 2.60 | 1.26 | 1.97 | 0.116 | 0.13 | 121 |
| The period | ..... | ..... | ..... | ..... | 1.02 | 933 |

SWIFTCURRENT CREEK AT SINCLAIR'S RANCH (LOWER STATION).

*Location.*—On the NW. ¼ Sec. 17, Tp. 10, Rge. 19, W. 3rd Mer., and below the mouth of Bone Creek.

*Records available.*—May 27, 1910, to October 31, 1915.

*Gauge.*—Chain gauge, attached to floor of highway bridge. The zero of the gauge was maintained at 85.73 feet during 1913-15.

*Bench-mark.*—Permanent iron bench-mark located on the right bank about 600 feet upstream from the bridge. Assumed elevation, 100.00 feet.

*Channel.*—Permanent.

*Discharge measurements.*—Made with meter from bridge or by wading and with a weir at very low stages.

*Winter flow.*—This station is not maintained during the frozen season.

*Observer.*—Mrs. K. Sinclair.

DISCHARGE MEASUREMENTS of Swiftcurrent Creek at Sinclair's Ranch (Lower Station), in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 17 | M. H. French | 36.0 | 37.20 | 1.29 | 2.99 | 48.0 |
| May 19 | J. E. Caughey | 36.0 | 57.30 | 0.99 | 3.09 | 57.0 |
| June 9 | do | 22.0 | 29.80 | 1.24 | 2.55 | 37.0 |
| June 29 | do | 22.0 | 34.40 | 1.14 | 2.87 | 40.0 |
| July 26 | do | 22.5 | 30.15 | 0.81 | 2.60 | 25.0 |
| Aug. 18 | do | 20.0 | 17.75 | 0.48 | 2.08 | 8.5 |
| Sept. 6 | G.H. Whyte and J. E. Caughey | 21.0 | 21.85 | 0.49 | 2.26 | 10.8 |
| Sept. 20 | J. E. Caughey | 22.0 | 25.80 | 0.64 | 2.50 | 16.7 |
| Oct. 9 | do | 22.0 | 31.20 | 0.87 | 2.69 | 27.0 |
| Oct. 25 | do | 21.0 | 23.30 | 0.82 | 2.28 | 19.0 |

DAILY GAUGE HEIGHT AND DISCHARGE of Swiftcurrent Creek at Sinclair's Ranch (Lower Station), for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec. ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 5.14 | 215 | 2.09 | 28 | 2.38 | 34 |
| 2 | ..... | ..... | 4.89 | 195 | 2.03 | 27 | 2.40 | 34 |
| 3 | ..... | ..... | 4.64 | 175 | 2.00 | 26 | 2.68 | 40 |
| 4 | ..... | ..... | 4.45 | 160 | 1.93 | 25 | 3.01 | 50 |
| 5 | ..... | ..... | 4.37 | 154 | 1.91 | 24 | 3.03 | 52 |
| 6 | ..... | ..... | 4.34 | 151 | 2.07 | 27 | 3.50 | 84 |
| 7 | ..... | ..... | 4.19 | 139 | 2.01 | 26 | 3.49 | 84 |
| 8 | ..... | ..... | 4.12 | 134 | 1.99 | 26 | 2.68 | 43 |
| 9 | ..... | ..... | 4.02 | 126 | 2.02 | 26 | 2.44 | 35 |
| 10 | ..... | ..... | 3.92 | 118 | 2.04 | 27 | 2.55*a* | 37 |
| 11 | ..... | ..... | 3.68 | 98 | 2.04 | 27 | 2.50 | 35 |
| 12 | ..... | ..... | 3.46 | 81 | 2.04 | 27 | 2.47 | 35 |
| 13 | ..... | ..... | 3.29 | 67 | 2.10 | 26 | 2.45 | 34 |
| 14 | ..... | ..... | 3.20 | 63 | 3.20 | 60 | 2.43 | 33 |
| 15 | ..... | ..... | 3.14 | 57 | 4.10 | 132 | 2.42 | 33 |
| 16 | ..... | ..... | 3.12 | 56 | 5.90 | 276 | 2.40 | 32 |
| 17 | ..... | ..... | 2.99 | 49 | 4.40 | 156 | 2.39 | 32 |
| 18 | ..... | ..... | 2.86 | 45 | 3.90 | 116 | 2.40 | 32 |
| 19 | ..... | ..... | 2.79 | 43 | 3.24 | 63 | 2.42 | 32 |
| 20 | ..... | ..... | 2.64 | 39 | 2.82 | 44 | 3.95 | 111 |
| 21 | ..... | ..... | 2.57 | 37 | 2.81 | 44 | 4.15 | 130 |
| 22 | ..... | ..... | 2.43 | 35 | 2.80 | 43 | 4.00 | 114 |
| 23 | ..... | ..... | 2.42 | 34 | 2.76 | 42 | 3.81 | 99 |
| 24 | ..... | ..... | 2.13 | 29 | 2.79 | 43 | 3.89 | 103 |
| 25 | ..... | ..... | 2.40 | 34 | 2.80 | 43 | 3.90 | 113 |
| 26 | ..... | ..... | 2.47 | 35 | 2.77 | 42 | 4.30 | 136 |
| 27 | ..... | ..... | 2.39 | 34 | 2.67 | 40 | 4.35 | 139 |
| 28 | 7.68 | 418 | 2.32 | 32 | 2.59 | 38 | 3.95 | 105 |
| 29 | 7.14 | 375 | 2.22 | 30 | 2.50 | 36 | 2.87*a* | 40 |
| 30 | 6.64 | 335 | 2.12 | 28 | 2.42 | 34 | 2.99 | 49 |
| 31 | 5.86 | 273 | ..... | ..... | 2.39 | 34 | ..... | ..... |

*a* to *a* Shifting conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Swiftcurrent Creek at Sinclair's Ranch (Lower Station), for 1915.—*Concluded.*

| DAY. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.99 | 49.0 | 2.46 | 16.3 | 2.00 | 7.2 | 2.42 | 15.0 |
| 2 | 3.01 | 51.0 | 2.44 | 15.8 | 2.11 | 8.8 | 2.43 | 15.4 |
| 3 | 3.02 | 52.0 | 2.40 | 14.4 | 2.37 | 13.7 | 2.68 | 26.0 |
| 4 | 2.99 | 49.0 | 2.35 | 13.2 | 2.35 | 13.2 | 2.89 | 41.0 |
| 5 | 3.00 | 50.0 | 2.30 | 12.0 | 2.34 | 13.0 | 2.91 | 43.0 |
| 6 | 6.00 | 290.0 | 2.25 | 11.1 | 2.35 | 13.2 | 2.87 | 40.0 |
| 7 | 4.15 | 142.0 | 2.20 | 10.2 | 2.36 | 13.4 | 2.84 | 37.0 |
| 8 | 3.85 | 118.0 | 2.15 | 9.4 | 2.37 | 13.7 | 2.75 | 30.0 |
| 9 | 3.00 | 50.0 | 2.12 | 8.9 | 2.36 | 13.4 | 2.66*a* | 25.0 |
| 10 | 2.95 | 46.0 | 2.13 | 9.1 | 2.34 | 13.0 | 2.72 | 30.0 |
| 11 | 2.72 | 28.0 | 2.12 | 8.9 | 2.35 | 13.2 | 2.71 | 31.0 |
| 12 | 2.70 | 27.0 | 2.11 | 8.8 | 2.39 | 14.2 | 2.70 | 31.0 |
| 13 | 2.62 | 23.0 | 2.11 | 8.8 | 2.45 | 16.0 | 2.68 | 31.0 |
| 14 | 2.70 | 27.0 | 2.10 | 8.6 | 2.60 | 22.0 | 2.65 | 30.0 |
| 15 | 2.69 | 26.0 | 2.09 | 8.5 | 2.68 | 26.0 | 2.60 | 28.0 |
| 16 | 2.52 | 18.0 | 2.09 | 8.5 | 2.67 | 25.0 | 2.60 | 29.0 |
| 17 | 2.57 | 20.0 | 2.09 | 8.5 | 2.62 | 23.0 | 2.57 | 28.0 |
| 18 | 2.60 | 22.0 | 2.11 | 8.8 | 2.60 | 22.0 | 2.55 | 28.0 |
| 19 | 2.90 | 42.0 | 2.09 | 8.5 | 2.55 | 19.6 | 2.56 | 29.0 |
| 20 | 2.57 | 20.0 | 2.10 | 8.6 | 2.50 | 17.6 | 2.51 | 27.0 |
| 21 | 2.52 | 18.4 | 2.09 | 8.5 | 2.51 | 18.0 | 2.49 | 27.0 |
| 22 | 2.50 | 17.6 | 2.08 | 8.3 | 2.47 | 16.6 | 2.49 | 28.0 |
| 23 | 2.48 | 17.0 | 2.05 | 7.9 | 2.43 | 15.4 | 2.50 | 30.0 |
| 24 | 2.50 | 17.6 | 2.04 | 7.8 | 2.41 | 14.7 | 2.48 | 20.0 |
| 25 | 2.54 | 19.2 | 2.03 | 7.6 | 2.40 | 14.4 | 2.28*a* | 19.0 |
| 26 | 2.60 | 22.0 | 2.01 | 7.3 | 2.39 | 14.2 | 2.37 | 23.0 |
| 27 | 2.57 | 20.0 | 2.00 | 7.2 | 2.37 | 13.7 | 2.37 | 23.0 |
| 28 | 2.57 | 20.0 | 2.00 | 7.2 | 2.39 | 14.2 | 2.39 | 24.0 |
| 29 | 2.55 | 19.6 | 2.02 | 7.5 | 2.40 | 14.4 | 2.35 | 22.0 |
| 30 | 2.52 | 18.4 | 2.01 | 7.3 | 2.41 | 14.7 | 2.32 | 21.0 |
| 31 | 2.47 | 16.6 | 2.00 | 7.2 | ..... | ..... | 2.30 | 20.0 |

*a* to *a* Shifting conditions.

MONTHLY DISCHARGE of Swiftcurrent Creek at Sinclair's Ranch (Lower Station), for 1915.

(Drainage area 366 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (28-31) | 418.0 | 273.0 | 350.0 | 0.956 | 0.142 | 2,778 |
| April | 215.0 | 28.0 | 83.1 | 0.227 | 0.250 | 4,945 |
| May | 276.0 | 24.0 | 52.0 | 0.143 | 0.160 | 3,228 |
| June | 139.0 | 32.0 | 64.0 | 0.175 | 0.200 | 3,808 |
| July | 290.0 | 16.6 | 43.8 | 0.120 | 0.140 | 2,693 |
| August | 16.3 | 7.2 | 9.4 | 0.026 | 0.030 | 578 |
| September | 26.0 | 7.2 | 15.7 | 0.043 | 0.048 | 934 |
| October | 43.0 | 15.0 | 27.8 | 0.076 | 0.088 | 1,709 |
| The period | ..... | ..... | ..... | ..... | 1.058 | 20,673 |

SWIFTCURRENT CREEK NEAR SWIFT CURRENT (UPPER STATION).

*Location.*—On SW. ¼ Sec. 12, Tp. 15, Rge. 14, W. 3rd Mer., above the water supply dam of the city of Swift Current.

*Records available.*—January 16, 1914, to December 31, 1915.

*Gauge.*—Vertical staff at old section. Zero elevation, 91.72 feet since establishment. Vertical staff in forebay of permanent control. Zero elevation maintained at 97.03 feet during 1915. Crest of four foot weir is permanent control. Elevation, 98.58 feet.

*Bench-mark.*—Painted top of pile of left abutment, upstream side, assumed elevation, 100.00

feet, at old section. Top of granite boulder thirty feet to left and twenty feet upstream from left end of concrete control. Assumed elevation, 100.00 feet.

*Control.*—Permanent.

*Discharge measurements.*—At high stages from bridge; at low stages by wading, or by weir.

*Winter flow.*—Affected by ice.

*Observer.*—Mrs. E. Mackintosh.

DISCHARGE MEASUREMENTS of Swiftcurrent Creek near Swift Current (Upper Station), in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq.-ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 13 | J. E. Caughey | ..... | ..... | ..... | 2.21 | 7.0*a* |
| Feb. 19 | F. R. Steinberger | ..... | ..... | ..... | 2.60 | 3.8*a* |
| Mar. 15 | R. J. Srigley | ..... | ..... | ..... | 2.50 | Nil. |
| Mar. 25 | do | 96.0 | 201.0 | 1.88 | 6.46*b* | 379.0 |
| Mar. 27 | do | 85.0 | 180.0 | 2.07 | 6.31 | 373.0 |
| Mar. 31 | H. B. R. Thompson | 74.0 | 134.0 | 2.01 | 5.49*b* | 268.0 |
| April 14 | do | 68.5 | 158.0 | 0.76 | 2.95 | 120.0 |
| June 3 | F. K. Beach | 44.5 | 57.0 | 0.92 | 2.60 | 52.0 |
| June 25 | do | 33.0 | 42.0 | 2.15 | 2.74 | 91.0 |
| Aug. 4 | do | 32.5 | 29.0 | 1.70 | 2.43 | 50.0 |
| Aug. 27 | do | 32.7 | 19.0 | 0.91 | 2.14 | 17.3 |
| Sept. 25 | do | 32.0 | 26.0 | 1.22 | 2.31 | 31.0 |
| Oct. 21 | do | 33.0 | 28.0 | 1.20 | 2.35 | 34.0 |
| Nov. 10 | W. R. McCaffrey | 40.0 | 37.0 | 0.70 | 2.20 | 26.0 |
| Nov. 22 | do | 32.0 | 18.2 | 1.21 | 2.14 | 22.0 |
| Dec. 8 | do | 34.0 | 20.0 | 1.14 | 2.09 | 23.0 |
| Dec. 22 | do | 22.0 | 10.7 | 0.85 | 1.75 | 9.1 |

*a* Weir measurement.
*b* Gauge height from gauge at traffic bridge.

DAILY GAUGE HEIGHT AND DISCHARGE of Swiftcurrent Creek near Swift Current (Upper Station), for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.22*a* | 7.6 | 2.50 | 4.0 | 3.07 | 6.9 | 5.30 | 250 | 2.51 | 51 | 2.63 | 66 |
| 2 | 2.17 | 7.7 | 2.57 | 4.7 | 3.12 | 6.9 | 5.45 | 265 | 2.50 | 50 | 2.62 | 65 |
| 3 | 2.12 | 7.9 | 2.77 | 5.4 | 3.12 | 6.7 | 6.55 | 398 | 2.50 | 50 | 2.60 | 62 |
| 4 | 2.15 | 8.0 | 2.77 | 5.3 | 3.02 | 6.3 | 6.00*b* | 325 | 2.49 | 49 | 2.60 | 62 |
| 5 | 2.17 | 8.5 | 2.42 | 3.3 | 2.87 | 6.0 | .....*c* | 988 | 2.49 | 49 | 2.68 | 74 |
| 6 | 2.22 | 8.7 | 1.97 | 2.0 | 2.87 | 5.4 | ..... | 296 | 2.49 | 49 | 2.86 | 108 |
| 7 | 2.26 | 9.0 | 1.95 | 1.2 | 2.87 | 5.0 | ..... | 610 | 2.48 | 48 | 2.95 | 127 |
| 8 | 2.33 | 9.0 | 1.92 | 1.0 | 2.82 | 4.1 | ..... | 404 | 2.48 | 48 | 2.93 | 123 |
| 9 | 2.89 | 9.0 | 1.92 | 1.7 | 2.67 | 3.5 | ..... | 284 | 2.48 | 48 | 2.89 | 114 |
| 10 | 3.52 | 8.6 | 1.95 | 2.2 | 2.62 | 2.8 | ..... | 239 | 2.47 | 47 | 2.85 | 106 |
| 11 | 2.41 | 8.0 | 1.97 | 3.0 | 2.52 | 2.0 | ..... | 194 | 2.47 | 47 | 2.80 | 95 |
| 12 | 2.27 | 7.4 | 2.07 | 3.2 | 2.47 | 1.0 | ..... | 184 | 2.46 | 46 | 2.76 | 88 |
| 13 | 2.21 | 7.0 | 2.17 | 3.3 | 2.42 | 0.7 | .....*c*... | 154 | 2.45 | 46 | 2.70 | 77 |
| 14 | 2.19 | 6.5 | 2.12 | 3.4 | 2.42 | 0.2 | 2.95 | 127 | 2.45 | 46 | 2.65 | 70 |
| 15 | 2.17 | 6.2 | 2.22 | 3.4 | 2.51 | Nil. | 2.95 | 127 | 2.50 | 50 | 2.63 | 66 |
| 16 | 2.17 | 6.0 | 2.32 | 3.5 | 2.67 | 16.0 | 2.93 | 123 | 2.70 | 77 | 2.60 | 62 |
| 17 | 2.17 | 5.8 | 2.54 | 3.6 | 2.87 | 22.0 | 2.90 | 116 | 2.70 | 77 | 2.58 | 60 |
| 18 | 2.17 | 5.8 | 2.54 | 3.7 | 3.12 | 29.0 | 2.90 | 116 | 2.70 | 77 | 2.52 | 52 |
| 19 | 2.17 | 5.5 | 2.62 | 3.8 | 3.32 | 35.0 | 2.87 | 110 | 3.20 | 185 | 2.50 | 50 |
| 20 | 2.17 | 5.1 | 2.77 | 4.0 | 3.35 | 38.0 | 2.83 | 101 | 3.00 | 138 | 2.59 | 61 |
| 21 | ..... | 4.9 | 2.82 | 4.0 | 3.37 | 42.0 | 2.79 | 93 | 2.96 | 129 | 2.67 | 72 |
| 22 | 2.15 | 4.1 | 2.87 | 4.1 | 3.77 | 111.0 | 2.75 | 86 | 2.90 | 116 | 2.80 | 95 |
| 23 | 2.12 | 4.0 | 2.87 | 4.4 | 3.87 | 237.0 | 2.70 | 77 | 2.84 | 103 | 2.89 | 114 |
| 24 | 2.09 | 4.0 | 2.92 | 4.8 | 4.87*a* | 266.0 | 2.65 | 70 | 2.75 | 86 | 2.87 | 110 |
| 25 | 2.07 | 3.8 | 2.95 | 5.1 | 6.46*b* | 385.0 | 2.60 | 62 | 2.60 | 62 | 2.74 | 84 |
| 26 | 2.07 | 3.7 | 2.97 | 5.5 | 6.52 | 394.0 | 2.60 | 62 | 2.65 | 70 | 2.70 | 77 |
| 27 | 2.05 | 3.6 | 3.02 | 6.0 | 6.31 | 364.0 | 2.59 | 61 | 2.68 | 74 | 2.75 | 86 |
| 28 | 2.05 | 3.5 | 3.07 | 6.3 | 5.78 | 299.0 | 2.57 | 58 | 2.70 | 77 | 2.89 | 114 |
| 29 | 2.12 | 3.4 | ..... | ..... | 6.50 | 391.0 | 2.56 | 57 | 2.69 | 76 | 2.92 | 120 |
| 30 | 2.26 | 3.3 | ..... | ..... | 5.90 | 313.0 | 2.53 | 54 | 2.67 | 72 | 2.92 | 120 |
| 31 | 2.37 | 3.6 | ..... | ..... | 5.49 | 269.0 | ..... | ..... | 2.65 | 70 | ..... | ..... |

*a* to *a* Ice conditions.
*b* to *b* Gauge at bridge.
*c* to *c* Gauge gone. Estimate from lower station.

DAILY GAUGE HEIGHT AND DISCHARGE of Swiftcurrent Creek near Swift Current (Upper Station), for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.90 | 116 | 2.50 | 50 | 2.17 | 24 | 2.34 | 36 | 2.38 | 39 | ..... | 2.5 |
| 2 | 2.87 | 110 | 2.49 | 49 | 2.20 | 26 | 2.34 | 36 | 2.37 | 39 | ..... | 3.3 |
| 3 | 2.85 | 106 | 2.45 | 46 | 2.22 | 27 | 2.35 | 37 | 2.37 | 39 | 2.04 | 20.0 |
| 4 | 2.81 | 97 | 2.43 | 44 | 2.21 | 27 | 2.35 | 37 | 2.36 | 38 | 2.15 | 26.0 |
| 5 | 2.77 | 90 | 2.41 | 42 | 2.20 | 26 | 2.35 | 37 | 2.35 | 37 | 2.20 | 27.0 |
| 6 | 2.75 | 86 | 2.39 | 40 | 2.20 | 26 | 2.36 | 38 | 2.33 | 35 | 2.24 | 26.0 |
| 7 | 2.70 | 77 | 2.37 | 39 | 2.19 | 25 | 2.36 | 38 | 2.32 | 35 | 2.25 | 26.0 |
| 8 | 2.68 | 74 | 2.35 | 37 | 2.19 | 25 | 2.38 | 39 | 2.27 | 31 | 2.09 | 23.0 |
| 9 | 2.65 | 70 | 2.30 | 33 | 2.20 | 26 | 2.40 | 41 | 2.25 | 30 | 1.95 | 14.8 |
| 10 | 2.69 | 76 | 2.28 | 32 | 2.20 | 26 | 2.43 | 44 | 2.20 | 26 | 1.92 | 14.0 |
| 11 | 3.10 | 161 | 2.26 | 30 | 2.20 | 26 | 2.45 | 46 | 2.15 | 23 | 1.89 | 13.8 |
| 12 | 3.00 | 138 | 2.22 | 27 | 2.21 | 27 | 2.46 | 46 | 2.10 | 20 | 1.87 | 13.0 |
| 13 | 2.93 | 123 | 2.20 | 26 | 2.21 | 27 | 2.47 | 47 | 2.08 | 19 | 1.85 | 12.0 |
| 14 | 2.84 | 103 | 2.18 | 25 | 2.22 | 27 | 2.47 | 47 | 2.05 | 18 | 1.83 | 11.0 |
| 15 | 2.77 | 90 | 2.18 | 25 | 2.22 | 27 | 2.45 | 46 | 2.09 | 20 | 1.80 | 9.0 |
| 16 | 2.74 | 84 | 2.18 | 25 | 2.23 | 28 | 2.41 | 42 | 2.14 | 22 | 1.75 | 7.0 |
| 17 | 2.71 | 79 | 2.18 | 25 | 2.23 | 28 | 2.40 | 41 | 2.24 | 29 | 1.67 | 6.0 |
| 18 | 2.68 | 74 | 2.18 | 25 | 2.24 | 29 | ..... | 40 | 2.22 | 27 | 1.55 | 6.0 |
| 19 | 2.64 | 68 | 2.17 | 24 | 2.25 | 30 | ..... | 39 | 2.20 | 26 | 1.65 | 6.0 |
| 20 | 2.70 | 77 | 2.17 | 24 | 2.26 | 30 | ..... | 38 | ..... | 25 | 1.80 | 8.5 |
| 21 | 2.69 | 76 | 2.17 | 24 | 2.28 | 32 | 2.35 | 37 | ..... | 23 | 1.80 | 9.1 |
| 22 | 2.65 | 70 | 2.17 | 24 | 2.30 | 33 | 2.34 | 36 | 2.14 | 22 | 1.78 | 9.1 |
| 23 | 2.50 | 50 | 2.17 | 24 | 2.30 | 33 | 2.33 | 35 | 2.14 | 22 | 1.70 | 9.0 |
| 24 | 2.47 | 47 | 2.16 | 24 | 2.31 | 34 | 2.33 | 35 | 2.13 | 23 | 1.60 | 8.7 |
| 25 | 2.45 | 46 | 2.16 | 24 | 2.31 | 34 | 2.33 | 35 | 2.13 | 23 | 1.47 | 8.4 |
| 26 | 2.41 | 42 | 2.16 | 24 | 2.32 | 35 | 2.32 | 35 | 2.10 | 20 | 1.35 | 8.0 |
| 27 | 2.43 | 44 | 2.14 | 22 | 2.32 | 35 | 2.32 | 35 | 2.04 | 17 | 1.28 | 7.8 |
| 28 | 2.48 | 48 | 2.14 | 22 | 2.33 | 35 | 2.33 | 35 | ..... | 2 | 1.20 | 7.5 |
| 29 | 2.55 | 56 | 2.14 | 22 | 2.33 | 35 | 2.34 | 36 | ..... | 2 | 1.15 | 7.2 |
| 30 | 2.53 | 54 | 2.13 | 22 | 2.34 | 36 | 2.36 | 38 | ..... | 2 | 1.12 | 7.0 |
| 31 | 2.50 | 50 | 2.13 | 22 | ..... | ..... | 2.38 | 39 | ..... | ..... | 1.08 | 6.8 |

MONTHLY DISCHARGE of Swiftcurrent Creek near Swift Current (Upper Station), for 1915.

(Drainage area 975 square miles.)

| Month | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 9.0 | 3.3 | 6.1 | 0.0063 | 0.007 | 375 |
| February | 6.3 | 1.0 | 3.8 | 0.0039 | 0.004 | 211 |
| March | 394.0 | Nil. | 105.0 | 0.1077 | 0.124 | 6,456 |
| April | 988.0 | 54.0 | 203.0 | 0.2082 | 0.232 | 12,079 |
| May | 185.0 | 46.0 | 71.0 | 0.0728 | 0.084 | 4,366 |
| June | 127.0 | 50.0 | 86.0 | 0.0882 | 0.098 | 5,117 |
| July | 161.0 | 42.0 | 80.0 | 0.0825 | 0.095 | 4,919 |
| August | 50.0 | 22.0 | 30.0 | 0.0308 | 0.036 | 1,845 |
| September | 36.0 | 24.0 | 29.0 | 0.0298 | 0.033 | 1,726 |
| October | 47.0 | 35.0 | 39.0 | 0.0400 | 0.046 | 2,398 |
| November | 39.0 | 2.0 | 24.0 | 0.0246 | 0.027 | 1,428 |
| December | 27.0 | 2.5 | 11.7 | 0.0120 | 0.014 | 719 |
| The year | | | | | 0.800 | 41,659 |

SWIFTCURRENT CREEK (LOWER STATION) NEAR SWIFT CURRENT.

*Location.*—On the NW. ¼ Sec. 18, Tp. 15, Rge. 13, W. 3rd Mer., below the water supply dam of the city of Swift Current.

*Records available.*—May 5, 1913, to December 31, 1915.

*Gauge.*—Vertical staff. Zero elevation of gauge has been maintained at 87.195 feet since establishment.

*Bench-marks.*—On rock. Assumed elevation up to June 11, 1914, 100.00 feet. From June

12, 1914, to December 31, 1915, another rock has been used having an elevation of 97.24 feet above the same datum.

*Channel.*—Permanent.

*Discharge measurements.*—By wading or from bridge.

*Winter flow.*—Affected by ice.

*Artificial control.*—The flow of the creek at this point is affected to some extent by the city water supply dam.

*Relation of gauge height to discharge.*—Affected during spring by growth of weeds.

*Observer.*—Stanley Tite.

DISCHARGE MEASUREMENTS of Swiftcurrent Creek near Swift Current (Lower Station), in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 13 | J. E. Caughey | 21 0 | 14.2 | 0.64 | 0.70 | 9.1 |
| Feb. 17 | F. R. Steinberger | 21.0 | 10.5 | 0.29 | 0.59 | 3.0 |
| Mar. 15 | R. J. Srigley | 23.5 | 14.1 | 0.85 | 0.78 | 11.9 |
| Mar. 25 | do | 51.0 | 160.9 | 3.09 | 2.71 | 494.0 |
| Mar. 31 | H. B. R. Thompson | 54.0 | 172.0 | 4.25 | 2.34 | 308.0 |
| April 14 | do | 62.3 | 80.0 | 1.76 | 1.63 | 140.0 |
| June 4 | F. K. Beach | 46.0 | 66.0 | 0.78 | 4.34 | 51.0 |
| June 25 | do | 47.7 | 85.0 | 1.17 | 1.62 | 100.0 |
| Aug. 4 | do | 47.0 | 67 0 | 0.72 | 1.21 | 48.0 |
| Aug. 27 | do | 46.7 | 47.0 | 2.27 | 1.00 | 10 7 |
| Sept. 25 | do | 26.0 | 35.0 | 0.69 | 1.14 | 24.0 |
| Oct. 21 | do | 26.0 | 35.0 | 0.79 | 1.18 | 28.0 |
| Nov. 10 | W. R. McCaffrey | 25.5 | 34.0 | 0.70 | 1.11 | 24.0 |
| Nov. 22 | do | 27.0 | 31.0 | 0.59 | 1.12 | 18.6 |
| Dec. 8 | do | 25.0 | 30.0 | 0.54 | 1.07 | 16.0 |
| Dec. 22 | do | 22.0 | 23.0 | 0.53 | 0.87 | 12.1 |

DAILY GAUGE HEIGHT AND DISCHARGE of Swiftcurrent Creek near Swift Current (Lower Station), for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 0.50*a* | 5.1 | 0.64 | 3.0 | 0.67 | 3.5 | 2.30 | 296 | 1.15 | 61 | 1.36 | 56 |
| 2 | 0.51 | 5.0 | 0.59 | 3.0 | 0.67 | 3.7 | 2.50 | 377 | 1.15 | 60 | 1.36 | 55 |
| 3 | 0.47 | 4.9 | 0.64 | 3.0 | 0.68 | 3.8 | 2.75 | 520 | 1.15 | 59 | 1.36 | 54 |
| 4 | 0.48 | 4.3 | 0.54 | 3.0 | 0.68 | 3.9 | 3.05 | 700 | 1.15 | 59 | 1.34*c* | 50 |
| 5 | 0.54 | 4.3 | 0.55 | 3.0 | 0.70 | 4.0 | 3.53 | 988 | 1.15 | 58 | 1.34 | 50 |
| 6 | 0 60 | 4.6 | 0.55 | 3.0 | 0.70 | 4.5 | 2.30 | 296 | 1 15 | 57 | 1.54 | 85 |
| 7 | 0.62 | 5.0 | 0.56 | 3.0 | 0.70 | 5.0 | 2.90 | 610 | 1.15 | 57 | 1.59 | 94 |
| 8 | 0.66 | 6.0 | 0.58 | 3.0 | 0.72 | 5.3 | 2.55 | 404 | 1.15 | 56 | 1.61 | 98 |
| 9 | 0.67 | 7.0 | 0.56 | 3.0 | 0.74 | 6.0 | 2.26 | 284 | 1.15 | 56 | 1.54 | 85 |
| 10 | 0.69 | 7.3 | 0.56 | 3.0 | 0.75 | 6.4 | 2.10 | 239 | 1.15 | 55 | 1 14 | 66 |
| 11 | 0.75 | 7.9 | 0.56 | 3.0 | 0.80 | 7.0 | 1.91 | 194 | 1.10 | 50 | 1.38 | 56 |
| 12 | 0.81 | 8.9 | 0 56 | 3.0 | 0.85 | 7.0 | 1.86 | 184 | 1.10 | 49 | 1.33 | 48 |
| 13 | 0.70 | 9.1 | 0.56 | 3.0 | 0.80 | 7.3 | 1.71 | 154 | 1.15 | 53 | 1.33 | 48 |
| 14 | 0.70 | 8.5 | 0 56 | 3.0 | 0.80 | 9.0 | 1.65 | 144 | 1.25 | 62 | 1 23 | 35 |
| 15 | 0.65 | 7.8 | 0.56 | 3.0 | 0.80*a* | 11.9 | 1.60*c* | 134 | 1.35 | 73 | 1.33 | 48 |
| 16 | 0.66 | 7.0 | 0.56 | 3.0 | 0.83*b* | 16.0 | 1.56 | 126 | 1.45 | 83 | 1.18 | 73 |
| 17 | 0 66 | 6.0 | 0.56 | 3.0 | 0.90 | 22.0 | 1.55 | 124 | 1.50 | 89 | 1.33 | 48 |
| 18 | 0.66 | 5.1 | 0.56 | 3.0 | 0.95 | 29.0 | 1.50 | 115 | 1.75 | 127 | 1.28 | 41 |
| 19 | 0.66 | 4.7 | 0.61 | 3.0 | 1.00 | 35.0 | 1.50 | 114 | 1.82 | 137 | 1.33 | 48 |
| 20 | 0.61 | 3.8 | 0.61 | 3.0 | 0.99 | 38.0 | 1.45 | 106 | 1.65 | 108 | 1.29 | 43 |
| 21 | 0.72 | 3.8 | 0.61 | 3.0 | 1.00 | 42.0 | 1.40 | 98 | 1.55 | 91 | 1 33 | 48 |
| 22 | 0.72 | 3.7 | 0.61 | 3.0 | 1.55 | 111.0 | 1.40 | 97 | 1.45 | 77 | 1.43 | 64 |
| 23 | 0.72 | 3.6 | 0.66 | 3.2 | 2.15 | 237.0 | 1.40 | 96 | 1.45 | 78 | 1.63 | 102 |
| 24 | 0.67 | 3 6 | 0.66 | 3.3 | 2 22*b* | 266.0 | 1.40 | 95 | 1.39 | 67 | 1.63 | 102 |
| 25 | 0.67 | 3.4 | 0.61 | 3.3 | 2.71 | 496.0 | 1.30 | 81 | 1.35 | 59 | 1.62 | 100 |
| 26 | 0.68 | 3.4 | 0.66 | 3.3 | 3.00 | 670.0 | 1 30 | 80 | 1.45 | 76 | 1.60 | 96 |
| 27 | 0.79 | 3.3 | 0.66 | 3.3 | 2.55 | 404.0 | 1.25 | 74 | 1.50 | 84 | 1.88 | 159 |
| 28 | 0.73 | 3 2 | 0.66 | 3.3 | 2.30 | 296 0 | 1.25 | 73 | 1.45 | 75 | 1.70 | 116 |
| 29 | 0 68 | 3.2 | ..... | ..... | 2.30 | 296.0 | 1.20 | 67 | 1.45 | 74 | 1.70 | 116 |
| 30 | 0.68 | 3.2 | ..... | ..... | 2 30 | 296.0 | 1.15 | 61 | 1.45 | 73 | 1.65 | 106 |
| 31 | 0.68 | 3.1 | ..... | ..... | 2.35 | 314.0 | ..... | ..... | 1.43 | 68 | ..... | ..... |

*a* to *a* Ice conditions. *b* to *b* Shifting conditions. *c* to *c* Shifting conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Swiftcurrent Creek near Swift Current (Lower Station), for 1915.—*Concluded.*

| DAY. | July. | | August. | | September. | | October. | | November. | | December | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge | Gauge Height | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.60 | 96 | 1.42 | 63.0 | 0.99 | 10.8 | 1.12 | 22 | 1.10 | 20.0 | 1.00 | 11.5 |
| 2 | 1.52 | 81 | 1.42 | 63.0 | 1.01 | 12.4 | 1.15 | 26 | 1.10 | 20.0 | 1.00 | 11.5 |
| 3 | 1.50 | 77 | 1.30 | 44.0 | 1.07 | 17.4 | 1.20 | 31 | 1.05 | 15.8 | 1.00 | 11.5 |
| 4 | 1.48 | 73 | 1.30 | 44.0 | 1.07 | 17.4 | 1.20 | 31 | 1.10 | 20.0 | 1.05 | 15.8 |
| 5 | 1.45 | 68 | 1.30 | 44.0 | 1.07 | 17.4 | 1.20 | 31 | 1.10 | 20.0 | 1.05 | 15.8 |
| 6 | 1.45 | 68 | 1.30 | 44.0 | 1.01 | 12.4 | 1.25 | 38 | 1.14 | 24.0 | 1.05 | 15.8 |
| 7 | 1.43 | 64 | 1.30 | 44.0 | 1.06 | 16.6 | 1.27 | 40 | 1.16 | 27.0 | 1.09*a* | 18.2 |
| 8 | 1.50 | 77 | 1.30 | 44.0 | 1.06 | 16.6 | 1.25 | 38 | 1.18 | 29.0 | 1.08 | 16.0 |
| 9 | 2.00 | 188 | 1.30 | 44.0 | 1.11 | 21.0 | 1.25 | 38 | 1.10 | 20.0 | 1.10 | 13.5 |
| 10 | 1.70 | 116 | 1.14 | 24.0 | 1.11 | 21.0 | 1.26 | 39 | 1.15 | 26.0 | 1.05 | 12.8 |
| 11 | 1.80 | 140 | 1.14 | 21.0 | 1.10 | 20.0 | 1.25 | 38 | 1.10 | 20.9 | 1.00 | 12.0 |
| 12 | 1.70 | 116 | 1.14 | 24.0 | 1.06 | 16.6 | 1.26 | 39 | 1.07 | 17.4 | 1.00 | 11.5 |
| 13 | 1.70 | 116 | 1.14 | 24.0 | 1.11 | 21.0 | 1.25 | 38 | 1.15 | 26.0 | 0.95 | 11.0 |
| 14 | 1.50 | 77 | 1.14 | 24.0 | 1.11 | 21.0 | 1.25 | 38 | 1.20 | 31.0 | 0.95 | 10.2 |
| 15 | 1.50 | 77 | 1.14 | 24.0 | 1.11 | 21.0 | 1.25 | 38 | 1.18 | 29.0 | 0.95 | 9.7 |
| 16 | 1.50 | 77 | 1.14 | 24.0 | 1.11 | 21.0 | 1.20 | 31 | 1.15 | 26.0 | 0.95 | 8.9 |
| 17 | 1.50 | 77 | 1.14 | 24.0 | 1.11 | 21.0 | 1.20 | 31 | 1.10 | 20.0 | 0.95 | 8.0 |
| 18 | 1.57 | 90 | 1.07 | 17.4 | 1.16 | 27.0 | 1.20 | 31 | 1.15 | 26.0 | 0.95 | 7.9 |
| 19 | 1.57 | 90 | 1.06 | 16.6 | 1.16 | 27.0 | 1.20 | 31 | 1.14 | 21.0 | 0.93 | 8.7 |
| 20 | 1.56 | 88 | 1.06 | 16.6 | 1.16 | 27.0 | 1.20 | 31 | 1.15 | 26.0 | 0.90 | 10.2 |
| 21 | 1.56 | 88 | 1.05 | 15.8 | 1.16 | 27.0 | 1.19 | 30 | 1.10 | 20.0 | 0.89 | 11.5 |
| 22 | 1.50 | 77 | 1.05 | 15.8 | 1.16 | 27.0 | 1.18 | 29 | 1.15 | 26.0 | 0.88 | 12.1 |
| 23 | 1.45 | 68 | 1.05 | 15.8 | 1.14 | 24.0 | 1.16 | 27 | 1.15 | 26.0 | 0.90 | 12.0 |
| 24 | 1.45 | 68 | 1.04 | 14.9 | 1.11 | 21.0 | 1.15 | 26 | 1.15 | 26.0 | 0.93 | 11.7 |
| 25 | 1.44 | 66 | 1.00 | 11.5 | 1.14 | 21.0 | 1.14 | 24 | 1.15 | 26.0 | 0.93 | 11.2 |
| 26 | 1.44 | 66 | 0.95 | 7.8 | 1.11 | 24.0 | 1.12 | 22 | 1.10 | 20.0 | 0.95 | 10.9 |
| 27 | 1.45 | 68 | 1.00 | 11.5 | 1.12 | 22.0 | 1.10 | 20 | 1.05 | 15.8 | 0.93 | 10.2 |
| 28 | 1.40 | 59 | 1.00 | 11.5 | 1.10 | 20.0 | 1.11 | 21 | 0.90 | 4.0 | 0.92 | 9.9 |
| 29 | 1.50 | 77 | 1.00 | 11.5 | 1.14 | 24.0 | 1.15 | 26 | 1.00 | 11.5 | 0.91 | 9.5 |
| 30 | 1.45 | 68 | 1.00 | 11.5 | 1.12 | 22.0 | 1.12 | 22 | 1.00 | 11.5 | 0.95 | 9.0 |
| 31 | 1.45 | 68 | 0.99 | 10.8 | ... | ... | 1.10 | 20 | | | 0.93*a* | 8.5 |

*a* to *a* Ice conditions.

MONTHLY DISCHARGE of Swiftcurrent Creek near Swift Current (Lower Station), for 1915.

(Drainage area 1,000 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area | Total in Acre-feet |
| January | 9.1 | 3.1 | 5.2 | 0.005 | 0.006 | [illegible] |
| February | 3.3 | 2.0 | 3.1 | 0.002 | 0.002 | 172 |
| March | 670.0 | 3.5 | 118.0 | 0.118 | 0.156 | [illegible] |
| April | 988.0 | 61.0 | 231.0 | 0.231 | 0.258 | [illegible] |
| May | 137.0 | 49.0 | 72.0 | 0.072 | 0.083 | [illegible] |
| June | 159.0 | 35.0 | 73.0 | 0.073 | 0.081 | [illegible] |
| July | 188.0 | 50.0 | 85.0 | 0.085 | 0.098 | [illegible] |
| August | 63.0 | 7.8 | 26.0 | 0.026 | 0.030 | [illegible] |
| September | 27.0 | 10.8 | 21.0 | 0.021 | 0.023 | [illegible] |
| October | 40.0 | 20.0 | 31.0 | 0.031 | 0.036 | [illegible] |
| November | 31.0 | 4.0 | 22.0 | 0.022 | 0.024 | [illegible] |
| December | 18.2 | 7.9 | 11.5 | 0.012 | [illegible] | 707 |
| The year | | | | | 0.791 | [illegible] |

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Swiftcurrent Creek drainage basin, in 1915.

| Date. | Engineer. | Stream. | Location. | Discharge. |
|---|---|---|---|---|
| | | | | *Sec.-ft.* |
| July 5 | J. E. Caughey | Hawkins Coulee | SE. 26-9-20-3 | 0.303*c* |
| Aug. 19 | do | do | do | 0.273*c* |

*c* Weir measurement.

## ANTELOPE LAKE DRAINAGE BASIN.

### *General Description.*

Antelope Lake is a small body of saline water, six miles long and from one to one and one-half miles wide, situated at an elevation of 2,300 feet above sea level. It lies in a deep depression north of the main line of the Canadian Pacific Railway, in Township 15, Range 18, West of the 3rd Meridian, and drains an area of about 350 square miles.

The lake receives its supply from Bridge Creek, which rises in the Cypress Hills. The altitude of the source of this creek is 2,800 feet and it has an average fall of fifteen feet per mile.

The valley traversed by Bridge Creek is narrow and quite shallow, rarely exceeding 100 feet in depth. The land lying along the creek bottom is very flat and liable to become inundated during periods of flood. The bench land is rolling prairie, cut up by innumerable coulees which drain the surrounding country into the main valley.

The mean annual rainfall amounts to about fourteen inches, most of which occurs during May, June and July.

The creek has only a small flow, and is dry along most of its course for several months during the year.

### BRIDGE CREEK AT RAYMOND'S RANCH.

*Location.*—On the SE. ¼ Sec. 33, Tp. 10, Rge. 22, W. 3rd Mer.

*Records available.*—April 8, 1911, to October 31, 1915.

*Gauge.*—Vertical staff. The elevation of the zero of the gauge has been maintained at 89.42 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Discharge measurements.*—Made with meter at flood stages and with weir at ordinary stage.

*Winter flow.*—This station is not maintained during the winter.

*Observer.*—Mrs. C. Raymond.

DISCHARGE MEASUREMENTS of Bridge Creek at Raymond's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 19 | J. E. Caughey | 4.0 | 1.90 | 0.06 | 2.19 | 1.14 |
| Mar. 25 | do | 2.6 | 1.90 | 1.62 | 1.15 | 3.10 |
| April 3 | do | 10.0 | 17.20 | 1.64 | 2.00 | 28.00 |
| April 13 | do | *a* | | | 0.70 | 1.19 |
| May 5 | do | | | | 0.50 | 0.22 |
| May 20 | do | | | | 0.55 | 0.39 |
| June 8 | do | | | | 0.56 | 0.68 |
| June 28 | do | | | | 0.64 | 0.76 |
| July 26 | do | | | | 0.71 | 0.49 |
| Aug. 17 | do | | | | 0.64 | 0.22 |
| Sept. 6 | G. H. Whyte and J. E. Caughey | | | | 0.66 | 0.19 |
| Sept. 20 | J. E. Caughey | | | | 0.72 | 0.46 |
| Oct. 9 | do | | | | 0.74 | 0.50 |
| Oct. 25 | do | *a* | | | 0.69 | 0.68 |

*a* to *a* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Bridge Creek at Raymond's Ranch, for 1915.

| Day. | March. | | April. | | May | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.35 | 20.00*a* | 0.46 | 0.13 | 0.75 | 1.60 |
| 2 | ..... | ..... | 2.65 | 35.00*a* | 0.46 | 0.13 | 1.00 | 4.80 |
| 3 | ..... | ..... | 2.00 | 28.00 | 0.51 | 0.25 | 1.10 | 6.50 |
| 4 | ..... | ..... | 1.40 | 12.70 | 0.45 | 0.11 | 1.08 | 6.10 |
| 5 | ..... | ..... | 1.25 | 9.40 | 0.50 | 0.22 | 1.13 | 7.00 |
| 6 | ..... | ..... | 0.90 | 3.30 | 0.53 | 0.32 | 0.80 | 2.10 |
| 7 | ..... | ..... | 0.98 | 4.50 | 0.51 | 0.25 | 0.54 | 0.34 |
| 8 | ..... | ..... | 0.95 | 4.00 | 0.53 | 0.32 | 0.58 | 0.50 |
| 9 | ..... | ..... | 0.92 | 3.60 | 0.46 | 0.13 | 0.59 | 0.54 |
| 10 | ..... | ..... | 0.90 | 3.30 | 0.49 | 0.20 | 0.63 | 0.74 |
| 11 | ..... | ..... | 0.92 | 3.60 | 0.51 | 0.25 | 0.68 | 1.05 |
| 12 | ..... | ..... | 0.85 | 2.60 | 0.50 | 0.22 | 0.65 | 0.84 |
| 13 | ..... | ..... | 0.70 | 1.19 | 0.65 | 0.84 | 0.60 | 0.58 |
| 14 | 2.22 | 1.00*a* | 0.78 | 1.90 | 0.90 | 3.30 | 0.65 | 0.84 |
| 15 | 2.31 | 1.05*a* | 0.75 | 1.60 | 1.60 | 17.50 | 0.60 | 0.58 |
| 16 | 2.32 | 1.10 | 0.73 | 1.44 | 1.20 | 8.40 | 0.56 | 0.42 |
| 17 | 2.82 | 1.12 | 0.70 | 1.19 | 1.03 | 5.30 | 0.59 | 0.54 |
| 18 | 2.32 | 1.13*a* | 0.68 | 1.05 | 0.90 | 3.30 | 0.63 | 0.74 |
| 19 | 2.12 | 1.14 | 0.63 | 0.74 | 0.83 | 2.40 | 0.85 | 2.60 |
| 20 | 2.37 | 1.20*a* | 0.68 | 1.05 | 0.55 | 0.38 | 0.73 | 1.44 |
| 21 | 2.54 | 2.00 | 0.65 | 0.84 | 0.58 | 0.50 | 0.70 | 1.19 |
| 22 | 2.87 | 2.50 | 0.59 | 0.54 | 0.53 | 0.32 | 0.75 | 1.60 |
| 23 | 2.22 | 2.70 | 0.55 | 0.38 | 0.51 | 0.25 | 0.78 | 1.90 |
| 24 | 1.93 | 3.00*a* | 0.53 | 0.32 | 0.58 | 0.50 | 0.70 | 1.19 |
| 25 | 1.14 | 3.10 | 0.50 | 0.22 | 1.80 | 22.70 | 0.85 | 2.60 |
| 26 | 1.10 | 3.00*a* | 0.47 | 0.15 | 1.28 | 10.10 | 0.80 | 2.10 |
| 27 | 1.05 | 4.00 | 0.45 | 0.11 | 0.83 | 2.40 | 0.75 | 1.60 |
| 28 | 1.10 | 5.00 | 0.53 | 0.32 | 0.58 | 0.50 | 0.70 | 0.76*b* |
| 29 | 0.98 | 5.00 | 0.48 | 0.20 | 0.65 | 0.84 | 0.78 | 1.80 |
| 30 | 1.06 | 8.00 | 0.46 | 0.13 | 0.75 | 1.60 | 0.75 | 1.51 |
| 31 | 1.01 | 12.00*a* | ..... | ..... | 0.70 | 1.19 | ..... | ..... |

*a* Discharge estimated.
*b* to *b* Shifting conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Bridge Creek at Raymond's Ranch, for 1915.—*Con.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 0.70 | 1.05 | 0.68 | 0.31 | 0.61 | 0.15 | 0.76 | 0.59 |
| 2 | 0.65 | 0.69 | 0.63 | 0.19 | 0.83 | 0.97 | 0.80 | 0.76 |
| 3 | 0.70 | 0.98 | 0.65 | 0.23 | 0.80 | 0.76 | 0.78 | 0.67 |
| 4 | 0.66 | 0.68 | 0.68 | 0.31 | 0.70 | 0.37 | 0.75 | 0.55 |
| 5 | 0.56 | 0.28 | 0.65 | 0.23 | 0.69 | 0.34 | 0.80 | 0.76 |
| 6 | 0.55 | 0.22 | 0.69 | 0.34 | 0.65 | 0.23 | 0.83 | 0.97 |
| 7 | 0.58 | 0.32 | 0.63 | 0.19 | 0.68 | 0.31 | 0.80 | 0.76 |
| 8 | 3.60 | 68.00 | 0.60 | 0.13 | 0.71 | 0.40 | 0.76 | 0.59 |
| 9 | 1.10 | 5.30 | 0.56 | 0.08 | 0.78 | 0.67 | 0.78 | 0.72*b* |
| 10 | 0.80 | 1.35 | 0.54 | 0.06 | 0.80 | 0.76 | 0.80 | 0.83 |
| 11 | 0.77 | 1.05 | 0.56 | 0.08 | 0.78 | 0.67 | 0.77 | 0.68 |
| 12 | 0.70 | 0.61 | 0.54 | 0.06 | 0.78 | 0.67 | 0.73 | 0.52 |
| 13 | 0.75 | 0.84 | 0.58 | 0.10 | 0.83 | 0.97 | 0.75 | 0.63 |
| 14 | 0.85 | 1.60 | 0.63 | 0.19 | 0.80 | 0.76 | 0.74 | 0.67 |
| 15 | 0.70 | 0.56 | 0.56 | 0.08 | 0.78 | 0.67 | 0.73 | 0.72 |
| 16 | 0.75 | 0.81 | 0.54 | 0.06 | 0.80 | 0.76 | 0.66 | 0.52 |
| 17 | 0.80 | 1.05 | 0.64 | 0.21 | 0.82 | 0.90 | 0.65 | 0.55 |
| 18 | 0.75 | 0.88 | 0.59 | 0.12 | 0.80 | 0.76 | 0.68 | 0.72 |
| 19 | 0.70 | 0.42 | 0.56 | 0.08 | 0.88 | 1.40 | 0.66 | 0.67 |
| 20 | 0.65 | 0.24 | 0.60 | 0.13 | 0.80 | 0.76 | 0.67 | 0.76 |
| 21 | 0.60 | 0.11 | 0.65 | 0.23 | 0.69 | 0.34 | 0.69 | 0.97 |
| 22 | 0.55 | 0.05 | 0.69 | 0.34 | 0.73 | 0.48 | 0.68 | 0.97 |
| 23 | 0.75 | 0.56 | 0.61 | 0.15 | 0.75 | 0.55 | 0.65 | 0.83 |
| 24 | 0.78 | 0.68 | 0.69 | 0.34 | 0.70 | 0.37 | 0.63 | 0.76 |
| 25 | 0.73 | 0.46*b* | 0.73 | 0.48 | 0.71 | 0.40 | 0.60 | 0.68 |
| 26 | 0.68 | 0.31 | 0.61 | 0.15 | 0.75 | 0.55 | 0.65 | 0.97 |
| 27 | 0.70 | 0.37 | 0.60 | 0.13 | 0.78 | 0.67 | 0.63 | 0.83 |
| 28 | 0.78 | 0.67 | 0.63 | 0.19 | 0.80 | 0.76 | 0.66 | 1.04 |
| 29 | 0.73 | 0.48 | 0.65 | 0.23 | 0.78 | 0.67 | 0.65 | 0.97 |
| 30 | 0.70 | 0.39 | 0.60 | 0.13 | 0.75 | 0.55 | 0.63 | 0.83 |
| 31 | 0.68 | 0.31 | 0.63 | 0.19 | ..... | ..... | 0.68 | 1.20*b* |

*b* to *b* Shifting conditions.

MONTHLY DISCHARGE of Bridge Creek at Raymond's Ranch, for 1915.

(Drainage area 6 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (14-31) | 12.00 | 1.00 | 3.220 | 0.537 | 0.36 | 115 |
| April | 35.00 | 0.11 | 4.770 | 0.793 | 0.88 | 284 |
| May | 22.70 | 0.11 | 2.740 | 0.457 | 0.53 | 168 |
| June | 7.00 | 0.34 | 1.870 | 0.311 | 0.35 | 111 |
| July | 68.00 | 0.05 | 2.940 | 0.490 | 0.56 | 181 |
| August | 0.48 | 0.06 | 0.184 | 0.031 | 0.04 | 11 |
| September | 1.10 | 0.15 | 0.620 | 0.103 | 0.12 | 37 |
| October | 1.20 | 0.52 | 0.770 | 0.129 | 0.15 | 47 |
| The period | ..... | ..... | ..... | ..... | 2.99 | 954 |

### DIMMOCK DITCH NEAR SKULL CREEK.

*Location.*—On SE. ¼ Sec. 16, Tp. 11, Rge. 21, W. 3rd Mer., and is 250 feet northwest of the intake of the ditch and 400 feet southeast of the flume.

*Records available.*—Discharge measurements only 1912 to 1915.

*Gauge.*—Vertical staff graduated to feet and inches. Zero elevation maintained at 96.53 feet since establishment.

*Bench-mark.*—On the top of initial point of soundings, which is a 4-inch x 4-inch timber driven into the ground on the south side of the ditch. Assumed elevation 100.00 feet.

*Channel.*—One channel at all stages. Clay bottom.

*Discharge measurements.*—Made with current-meter or weir.

*Observer.*—Dimmock Bros.

DISCHARGE MEASUREMENTS of Dimmock Ditch near Skull Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 5 | J. E. Caughey | ..... | ..... | ..... | 0.50 | 0.08*a* |
| June 29 | do | ..... | ..... | ..... | 0.71 | 0.37*a* |

*a* Weir measurement.

### BRIDGE CREEK AT GULL LAKE.

*Location.*—On the SE. ¼ Sec. 23, Tp. 13, Rge. 19, W. 3rd Mer., at the highway bridge near the Canadian Pacific Railway station.

*Records available.*—March 29, 1911, to October 31, 1915.

*Gauge.*—Vertical staff. Zero maintained at 95.63 feet since establishment.

*Bench-mark.*—Permanent iron. Assumed elevation, 100.00 feet.

*Channel.*—Fairly permanent but may be affected by vegetation.

*Discharge measurements.*—With meter from bridge, or by wading or with weir.

*Winter flow.*—No winter observations have been taken.

*Observer.*—J. R. Gaskell.

DISCHARGE MEASUREMENTS of Bridge Creek at Gull Lake, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 16 | R. J. Stigley | | | | | Nil. |
| Mar. 26 | do | 15.0 | 8.2 | 0.70 | 1.49 | 5.70 |
| April 1 | H. B. R. Thompson | 10.6 | 7.0 | 0.05 | 0.97 | 0.33 |
| April 9 | do | 10.5 | 7.1 | 0.08 | 0.84 | 0.58 |
| April 17 | do | | | | 0.48 | 0.04*a* |
| June 2 | F. K. Beach | | | | 0.42 | 0.00*b* |
| June 28 | do | | | | 0.53 | 0.00*b* |
| Aug. 6 | do | | | | Dry | Nil |
| Aug. 28 | do | | | | " | " |
| Sept. 28 | do | | | | " | " |
| Oct. 23 | do | | | | " | " |

*a* Weir measurement.
*b* Slight flow, too small to measure

DAILY GAUGE HEIGHT AND DISCHARGE of Bridge Creek at Gull Lake, for 1915.

| Day. | March. | | April. | | May. | | June. | | July. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec. ft.* |
| 1 | ..... | ..... | 0.97 | 0.98 | ..... | Nil. | 0.43 | Nil. | 0.52 | 0.10 |
| 2 | ..... | ..... | 1.13 | 1.70 | ..... | " | 0.41 | " | 0.49 | 0.07 |
| 3 | ..... | ..... | 1.64 | 9.00 | ..... | " | 0.39 | " | 0.47 | 0.04 |
| 4 | ..... | ..... | 1.48 | 5.60 | ..... | " | 0.37 | " | 0.45 | 0.02 |
| 5 | ..... | ..... | 1.35 | 3.60 | ..... | " | ..... | " | 0.43 | 0.01 |
| 6 | ..... | ..... | 1.24 | 2.50 | ..... | " | ..... | " | 0.44 | 0.01 |
| 7 | ..... | ..... | 1.09 | 1.48 | ..... | " | ..... | " | 0.45 | 0.02 |
| 8 | ..... | ..... | 0.96 | 0.95 | ..... | " | ..... | " | 0.43 | 0.00 |
| 9 | ..... | ..... | 0.91 | 0.78 | ..... | " | ..... | " | 0.41 | 0.00 |
| 10 | ..... | ..... | 0.83 | 0.57 | ..... | " | ..... | " | 0.44 | 0.01 |
| 11 | ..... | ..... | 0.77 | 0.43 | ..... | " | ..... | " | 0.45 | 0.02 |
| 12 | ..... | ..... | 0.71 | 0.32 | ..... | " | ..... | " | 0.43 | 0.00 |
| 13 | ..... | ..... | 0.66 | 0.24 | ..... | " | ..... | " | 0.45 | 0.02 |
| 14 | ..... | ..... | 0.61 | 0.17 | ..... | " | ..... | " | 0.53 | 0.10 |
| 15 | ..... | ..... | 0.54 | 0.11 | ..... | " | ..... | " | 0.49 | 0.07 |
| 16 | ..... | ..... | 0.51 | 0.09 | 0.45 | Nil. | ..... | " | 0.51 | 0.09 |
| 17 | ..... | ..... | 0.47 | 0.04 | ..... | " | ..... | " | 0.51 | 0.09 |
| 18 | ..... | ..... | 0.45 | Nil. | ..... | " | ..... | " | 0.50 | 0.08 |
| 19 | ..... | ..... | 0.45 | " | ..... | " | ..... | " | 0.47 | 0.02 |
| 20 | ..... | ..... | ..... | " | ..... | " | ..... | " | 0.46 | 0.01 |
| 21 | ..... | ..... | ..... | " | ..... | " | ..... | " | 0.45 | Nil.*c* |
| 22 | 0.80 | 0.49*a* | ..... | " | ..... | " | ..... | " | 0.44 | ..... |
| 23 | 1.85 | 14.40 | ..... | " | ..... | " | ..... | " | 0.43 | ..... |
| 24 | 3.15 | 68.00 | ..... | " | ..... | " | ..... | " | 0.43 | ..... |
| 25 | 2.59 | 41.00 | ..... | " | ..... | " | ..... | " | 0.42 | ..... |
| 26 | 1.95 | 17.30 | ..... | " | ..... | " | ..... | 0.15*b* | 0.41 | ..... |
| 27 | 1.70 | 10.40 | ..... | " | ..... | " | ..... | 0.05*b* | 0.41 | ..... |
| 28 | 1.31 | 3.10 | ..... | " | ..... | " | 0.43 | Nil. | 0.41 | ..... |
| 29 | 1.18 | 2.00 | ..... | " | ..... | " | 0.41 | " | 0.40 | ..... |
| 30 | 1.07 | 1.40 | ..... | " | 0.49 | " | 0.46 | 0.01 | 0.39 | ..... |
| 31 | 1.01 | 1.12 | ..... | " | 0.47 | " | ..... | ..... | 0.39 | ..... |

*a* Believed there was no previous discharge in March.
*b* No observation. Discharge estimated.
*c* Dry to October 31.

MONTHLY DISCHARGE of Bridge Creek at Gull Lake, for 1915.

(Drainage area 231 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (22-31) | 68.00 | 0.00 | 5.10 | 0.02390 | 0.03 | 314 |
| April | 9.00 | 0.00 | 0.95 | 0.00446 | 0.01 | 57 |
| May | 0.00 | 0.00 | 0.00 | 0.00000 | 0.00 | Nil. |
| June | 0.15 | 0.00 | 0.01 | 0.00004 | 0.00 | " |
| July | 0.10 | 0.00 | 0.03 | 0.00014 | 0.00 | 2 |
| August | 0.00 | 0.00 | 0.00 | 0.00000 | 0.00 | Nil. |
| September | 0.00 | 0.00 | 0.00 | 0.00000 | 0.00 | " |
| October | 0.00 | 0.00 | 0.00 | 0.00000 | 0.00 | " |
| The period | ..... | ..... | ..... | ..... | 0.04 | 373 |

NOTE.—It is believed that the discharge here shown is the total discharge of the year.

SPRING NO. 1 NEAR GULL LAKE.

*Location.*—On NW. ¼ Sec. 32, Tp. 12, Rge. 18, W. 3rd Mer., in a deep coulee.
*Records available.*—March 13, to October 31, 1915. Discharge measurements only in 1914.
*Gauge.*—Vertical staff. Zero maintained at elevation of 89.36 feet since establishment.

*Bench-mark.*—Wood post. Assumed elevation, 100.00 feet.
*Channel.*—Shifting.
*Discharge measurements.*—Using permanent one-foot weir.
*Observer.*—Percy C. Downey.

DISCHARGE MEASUREMENTS of Spring No. 1 near Gull Lake, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 11 | J. E. Caughey | | | | | 0.110*b* |
| Feb. 16 | F. R. Steinberger | | | | | *a* |
| Mar. 5 | do | | | | | *a* |
| April 9 | H. B. R. Thompson | | | | 1.910 | 0.496*b* |
| April 13 | do | | | | 2.500 | 0.240*b* |
| April 16 | do | | | | 1.430 | 0.170*b* |
| May 11 | G. H. Whyte | | | | 1.295 | 0.090*b* |
| June 2 | F. K. Beach | | | | 1.360 | 0.197*b* |
| June 28 | do | | | | 1.220 | 0.119*b* |
| Aug. 6 | do | | | | 1.095 | 0.037*b* |
| Aug. 28 | do | | | | 1.030 | 0.017*b* |
| Sept. 28 | do | | | | 1.130 | 0.088*b* |
| Oct. 22 | do | | | | 1.120 | 0.074*b* |

*a* Gauging impossible on account of ice conditions.
*b* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Spring No. 1 near Gull Lake, for 1915.

| Day. | June. | | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | | | 1.16 | 0.05 | 1.12 | 0.04 | | 0.01 | | 0.13 |
| 2 | | | | 0.08 | | 0.04 | 0.99 | 0.01 | | 0.15 |
| 3 | | | | 0.12 | | 0.04 | | 0.02 | 1.16 | 0.18 |
| 4 | | | 1.22 | 0.16 | | 0.04 | | 0.02 | | 0.17 |
| 5 | | | | 0.14 | | 0.04 | 1.07 | 0.02 | | 0.15 |
| 6 | | | | 0.12 | 1.10 | 0.04 | | 0.02 | | 0.14 |
| 7 | | | | 0.10 | | 0.02 | | 0.03 | 1.16 | 0.11 |
| 8 | | | 1.20 | 0.09 | 0.99 | 0.01 | | 0.04 | | 0.10 |
| 9 | | | | 0.09 | | 0.02 | 1.10 | 0.04 | | 0.09 |
| 10 | | | | 0.09 | | 0.03 | | 0.05 | 1.14 | 0.09 |
| 11 | | | 1.18 | 0.09 | | 0.04 | | 0.06 | | 0.09 |
| 12 | | | | 0.09 | 1.08 | 0.05 | 1.15 | 0.07 | | 0.09 |
| 13 | | | | 0.09 | | 0.04 | | 0.06 | | 0.09 |
| 14 | | | | 0.09 | | 0.03 | | 0.06 | 1.14 | 0.09 |
| 15 | | | 1.15 | 0.09 | 1.04 | 0.02 | 1.11 | 0.06 | | 0.08 |
| 16 | | | | 0.10 | | 0.02 | | 0.06 | | 0.08 |
| 17 | | | | 0.12 | | 0.02 | | 0.06 | 1.12 | 0.08 |
| 18 | | | 1.24 | 0.14 | | 0.02 | | 0.06 | | 0.08 |
| 19 | | | | 0.10 | 1.05 | 0.02 | 1.12 | 0.06 | | 0.08 |
| 20 | | | | 0.07 | | 0.02 | | 0.06 | 1.14 | 0.09 |
| 21 | | | | 0.04 | | 0.01 | | 0.05 | | 0.08 |
| 22 | | | 1.06 | 0.01 | 1.04 | 0.01 | | 0.04 | 1.12 | 0.07 |
| 23 | 1.15 | 0.09 | | 0.03 | | 0.01 | | 0.04 | | 0.07 |
| 24 | | 0.09 | | 0.04 | | 0.01 | 1.00 | 0.04 | 1.12 | 0.07 |
| 25 | | 0.10 | 1.12 | 0.05 | | 0.00 | | 0.04 | | 0.05 |
| 26 | | 0.13 | | 0.07 | | 0.00 | 1.02 | 0.04 | | 0.04 |
| 27 | 1.25 | 0.14 | | 0.09 | 0.93 | Nil. | | 0.06 | 1.08 | 0.03 |
| 28 | 1.22 | 0.12 | 1.19 | 0.11 | 1.03 | 0.02 | 1.13 | 0.09 | | 0.04 |
| 29 | | 0.09 | | 0.10 | 0.92 | 0.00 | 1.14 | 0.09 | | 0.04 |
| 30 | | 0.07 | | 0.08 | | 0.00 | | 0.11 | | 0.04 |
| 31 | | | | 0.06 | | 0.00 | | | 1.11 | 0.04 |

NOTE.—On days where gauge height is shown, head on a one-foot weir was observed and used to compute discharge. Where no gauge height is shown discharge is estimated.

MONTHLY DISCHARGE of Spring No. 1 near Gull Lake, for 1915.

(Drainage area 2,880 acres.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (13-31) | ..... | ..... | 1.17*a* | 0.2600 | 0.18 | 44 |
| April | ..... | ..... | 0.80*a* | 0.1780 | 0.20 | 48 |
| May | ..... | ..... | 0.13*a* | 0.0289 | 0.03 | 8 |
| June | ..... | ..... | 0.13*a* | 0.0289 | 0.03 | 8 |
| July | 0.16 | 0.01 | 0.09 | 0.0200 | 0.02 | 6 |
| August | 0.05 | Nil. | 0.02 | 0.0044 | 0.01 | 1 |
| September | 0.11 | 0.01 | 0.05 | 0.0111 | 0.01 | 3 |
| October | 0.18 | 0.03 | 0.09 | 0.0200 | 0.02 | 6 |
| The period | ..... | ..... | ..... | ..... | 0.50 | 124 |

*a* Mean discharge estimated by relation to discharge and drainage area of Spring No. 2.

SPRING NO. 2 NEAR GULL LAKE.

*Location.*—On NE. ¼ Sec. 27, Tp. 12, Rge. 19, W. 3rd Mer.
*Records available.*—March 13 to October 31, 1915. Discharge measurements only in 1914.
*Gauge.*—Vertical staff. Zero maintained at elevation of 91.38 feet since establishment.
*Bench-mark.*—Boulder 50 feet east. Assumed elevation, 100.00 feet.
*Channel.*—Shifting.
*Discharge measurements.*—Using one-foot weir.
*Observer.*—A. Gallagher.

DISCHARGE MEASUREMENTS of Spring No. 2 near Gull Lake, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 11 | J. E. Caughey | ..... | ..... | ..... | ..... | 0.065*a* |
| Mar. 6 | F. R. Steinberger | ..... | ..... | ..... | ..... | 0.078*a* |
| Mar. 13 | J. E. Caughey | ..... | ..... | ..... | 1.36 | 0.094*a* |
| Mar. 16 | R. J. Srigley | ..... | ..... | ..... | 1.76 | 0.328*a* |
| Mar. 26 | do | ..... | ..... | ..... | 1.51 | 0.074*a* |
| April 1 | H. B. R. Thompson | ..... | ..... | ..... | 1.82 | 0.300*a* |
| April 9 | do | ..... | ..... | ..... | 1.59 | 0.079*a* |
| April 13 | do | ..... | ..... | ..... | 1.58 | 0.120*a* |
| April 17 | do | ..... | ..... | ..... | 1.57 | 0.170*a* |
| May 11 | G. H. Whyte | ..... | ..... | ..... | 1.51 | 0.061*a* |
| June 2 | F. K. Beach | ..... | ..... | ..... | 1.50 | 0.090*a* |
| June 28 | do | ..... | ..... | ..... | 1.44 | 0.074*a* |
| Aug. 6 | do | ..... | ..... | ..... | 1.36 | 0.048*a* |
| Aug. 28 | do | ..... | ..... | ..... | 1.32 | 0.037*a* |
| Sept. 28 | do | ..... | ..... | ..... | 1.38 | 0.077*a* |
| Oct. 23 | do | ..... | ..... | ..... | 1.36 | 0.066*a* |

*a* Weir measurement.

## Daily Gauge Height and Discharge of Spring No. 2 near Gull Lake, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.82 | 0.30 | 1.50 | 0.09 | 1.46 | 0.08 |
| 2 | ..... | ..... | 2.00 | 0.47 | 1.50 | 0.09 | 1.50 | 0.09 |
| 3 | ..... | ..... | 2.02 | 0.48 | 1.51 | 0.09 | 1.50 | 0.09 |
| 4 | ..... | ..... | 1.78 | 0.25 | 1.50 | 0.08 | ..... | 0.08 |
| 5 | ..... | ..... | 1.72 | 0.20 | 1.52 | 0.09 | 1.48 | 0.08 |
| 6 | ..... | ..... | 1.66 | 0.14 | 1.53 | 0.09 | ..... | 0.08 |
| 7 | ..... | ..... | 1.61 | 0.10 | 1.52 | 0.08 | 1.47 | 0.08 |
| 8 | ..... | ..... | 1.60 | 0.09 | 1.51 | 0.07 | ..... | 0.08 |
| 9 | ..... | ..... | 1.55 | 0.05 | 1.51 | 0.07 | 1.45 | 0.07 |
| 10 | ..... | ..... | 1.53 | 0.05 | 1.51 | 0.07 | ..... | 0.07 |
| 11 | ..... | ..... | 1.54 | 0.07 | 1.52 | 0.07 | 1.46 | 0.08 |
| 12 | ..... | ..... | 1.55 | 0.09 | 1.52 | 0.07 | ..... | 0.08 |
| 13 | 1.36 | 0.09 | 1.55 | 0.10 | 1.54 | 0.08 | 1.45 | 0.07 |
| 14 | 1.37 | 0.10 | 1.56 | 0.12 | ..... | 0.11 | ..... | 0.07 |
| 15 | 1.37 | 0.10 | 1.58 | 0.15 | 1.63 | 0.15 | 1.46 | 0.08 |
| 16 | 1.85 | 0.41 | 1.56 | 0.15 | 1.58 | 0.11 | ..... | 0.08 |
| 17 | 1.85 | 0.40 | 1.56 | 0.16 | 1.55 | 0.09 | 1.46 | 0.08 |
| 18 | 1.46 | 0.12 | 1.56 | 0.16 | 1.53 | 0.08 | ..... | 0.09 |
| 19 | 1.48 | 0.12 | 1.53 | 0.14 | 1.48 | 0.06 | 1.50 | 0.10 |
| 20 | 1.60 | 0.18 | 1.52 | 0.13 | 1.45 | 0.05 | ..... | 0.09 |
| 21 | 2.17 | 0.69 | 1.56 | 0.15 | 1.47 | 0.06 | 1.48 | 0.09 |
| 22 | 1.60 | 0.16 | 1.55 | 0.14 | 1.49 | 0.07 | ..... | 0.08 |
| 23 | 1.83 | 0.34 | 1.53 | 0.13 | 1.50 | 0.07 | 1.45 | 0.08 |
| 24 | 1.55 | 0.11 | 1.52 | 0.12 | 1.52 | 0.09 | ..... | 0.09 |
| 25 | 1.60 | 0.14 | 1.52 | 0.12 | 1.50 | 0.08 | 1.47 | 0.09 |
| 26 | 1.55 | 0.10 | 1.53 | 0.12 | 1.52 | 0.09 | ..... | 0.08 |
| 27 | 1.60 | 0.13 | 1.53 | 0.12 | 1.50 | 0.08 | 1.46 | 0.08 |
| 28 | 1.60 | 0.13 | 1.52 | 0.11 | 1.48 | 0.07 | 1.44 | 0.07 |
| 29 | 1.66 | 0.17 | 1.51 | 0.10 | 1.55 | 0.11 | 1.45 | 0.08 |
| 30 | 1.63 | 0.15 | 1.50 | 0.09 | 1.50 | 0.09 | *a* | 0.08 |
| 31 | 1.72 | 0.22 | ..... | ..... | 1.48 | 0.08 | ..... | ..... |

*a* Observations discontinued.

## Monthly Discharge of Spring No. 2 near Gull Lake, for 1915.

(Drainage area 366 acres.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area | Total in Acre-feet. |
| March (13-31) | 0.69 | 0.08 | 0.20 | 0.350 | 0.25 | 8 |
| April | 0.48 | 0.05 | 0.15 | 0.262 | 0.29 | 9 |
| May | 0.15 | 0.05 | 0.08 | 0.140 | 0.16 | 5 |
| June | 0.10 | 0.07 | 0.08 | 0.140 | 0.16 | 5 |
| July | ..... | ..... | 0.05*a* | 0.088 | 0.18 | 6 |
| August | ..... | ..... | 0.04*a* | 0.070 | 0.08 | 2 |
| September | ..... | ..... | 0.04*a* | 0.070 | 0.08 | 2 |
| October | ..... | ..... | 0.08*a* | 0.140 | 0.16 | 5 |
| The period | ..... | ..... | ..... | ..... | 1.16 | 42 |

*a* Mean discharge estimated by relation to discharge at Spring No. 1.

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Antelope Lake drainage basin, in 1915.

| Date. | Engineer. | Stream. | Location. | Width. | Area of Section. | Mean Velocity. | Discharge. |
|---|---|---|---|---|---|---|---|
| June 28.... | F. K. Beach..... | Spring No. 1A.... | NE. 31-12-18-3.... | Weir. | ..... | ..... | 0.0062 |
| Aug. 6.... | do ..... | do .... | do ... | " | ..... | ..... | 0.0076 |
| Aug. 28.... | do ..... | do .... | do ... | " | ..... | ..... | 0.0053 |
| Sept. 28.... | do ..... | do .... | do ... | " | ..... | ..... | 0.0107 |
| Oct. 22.... | do ..... | do .... | do ... | " | ..... | ..... | 0.0087 |
| June 28.... | do ..... | Spring No 1B.... | SW. 1-13-19-3..... | " | ..... | ..... | 0.1560 |
| Aug. 6.... | do ..... | do .... | do ..... | " | ..... | ..... | Nil. |
| Aug. 28.... | do ..... | do .... | do ..... | " | ..... | ..... | " |
| Aug. 6.... | do ..... | C.P.R. Spring A... | NW. 25-12-19-3... | " | ..... | ..... | 0.0345 |
| Aug. 6.... | do ..... | do B... | do ... | " | ..... | ..... | 0.0015 |
| Aug. 28.... | do ..... | do A... | do ... | " | ..... | ..... | 0.0260 |
| Aug. 28.... | do ..... | do B... | do ... | " | ..... | ..... | 0.0011 |
| Sept. 28.... | do ..... | do A... | do ... | " | ..... | ..... | 0.0603 |
| Sept. 28.... | do ..... | do B... | do ... | " | ..... | ..... | 0.0015 |
| Oct. 22.... | do ..... | do A... | do ... | " | ..... | ..... | 0.0318 |
| Oct. 22.... | do ..... | do B... | do ... | " | ..... | ..... | 0.0010 |
| Jan. 11 ... | J. E. Caughey.... | Spring No. 3..... | SW. 27-12-19-3.... | " | ..... | ..... | Nil. |
| Feb. 16.... | F. R. Steinbreger.. | do ..... | do ... | " | ..... | ..... | " |
| Mar. 5.... | do .. | do ..... | do ... | " | ..... | ..... | " |
| April 9.... | H. B. R. Thompson | do ..... | do ... | " | ..... | ..... | 0.5150 |
| April 13.... | do | do ..... | do ... | " | ..... | ..... | 0.1871 |
| April 17.... | do | do ..... | do ... | " | ..... | ..... | 0.0402 |
| May 11.... | G. H. Whyte..... | do ..... | do ... | " | ..... | ..... | 0.0130 |
| June 2.... | F. K. Beach..... | do ..... | do ... | " | ..... | ..... | 0.0470 |
| June 28.... | do ..... | do ..... | do ... | " | ..... | ..... | 0.0032 |
| Aug. 6.... | do ..... | do ..... | do ... | " | ..... | ..... | Nil. |
| Aug. 28.... | do ..... | do ..... | do ... | " | ..... | ..... | " |
| Sept. 28.... | do ..... | do ..... | do ... | " | ..... | ..... | " |
| Oct. 23.... | do ..... | do ..... | do ... | " | ..... | ..... | " |

## LAKE OF THE NARROWS DRAINAGE BASIN.

### *General Description.*

Lake of the Narrows is a small lake three miles long and one and one-half miles wide, in Township 3, Range 23, West of the 3rd Meridian. It has a drainage area of about 200 square miles.

The principal stream in the basin is Skull Creek, which rises in the eastern slope of Cypress Hills. It flows through a narrow valley for the greater part of its course, but as it nears the lake, the valley widens out into large meadows. The surrounding country is rolling prairie.

In very dry years such as 1910 and 1914 Skull Creek goes dry for a short time. The mean annual precipitation in the drainage basin is about thirteen inches.

### SKULL CREEK AT DOYLE'S RANCH.

*Location.*—On the SE. ¼ Sec. 32, Tp. 10, Rge. 22, W. 3rd Mer., near Skull Creek Post Office. On September 1, 1915, the gauge was moved to this location from the NE. ¼ Sec. 29, Tp. 10, Rge. 22, W. 3rd Mer., about one mile upstream.

*Records available.*—April 8, 1911, to October 31, 1915.

*Gauge.*—Vertical staff.

*Bench-marks.*—(1) A stump on the right bank about 50 feet south of the gauge. Elevation above the zero of the gauge 7.92 feet. (2) A stump on the right bank about 45 feet southeast of the gauge. Elevation 6.75 feet above the zero of the gauge.

*Discharge measurements.*—Made with the meter and with a weir at low stages.

*Winter flow.*—This stream is not maintained during winter.

*Observer.*—Thomas Doyle.

DISCHARGE MEASUREMENTS of Skull Creek at Doyle's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 19 | J. E. Caughey | 7.5 | 2.90 | 1.16 | 2.03 | 3.40 |
| Mar. 25 | do | 17.0 | 14.90 | 0.79 | 2.49 | 11.60 |
| April 4 | do | 20.0 | 30.00 | 2.51 | 2.80 | 76.00 |
| April 13 | do | 16.0 | 9.60 | 0.83 | 1.91 | 8.00 |
| May 4 | do | 7.3 | 2.56 | 0.95 | 1.79 | 2.40 |
| May 20 | do | 7.0 | 3.40 | 1.08 | 1.87 | 3.70 |
| June 8 | do | 7.0 | 3.60 | 0.98 | 1.87 | 3.50 |
| June 28 | do | 7.0 | 3.80 | 1.29 | 1.92 | 4.80 |
| July 24 | do | 8.0 | 3.85 | 1.12 | 1.90 | 4.30 |
| Aug. 16 | do | 5.7 | 1.65 | 0.55 | 1.71 | 0.90 |
| Sept. 5 | G. H. Whyte and J. E. Caughey | 6.0 | 2.30 | 0.64 | 1.74 | 1.47 |
| Sept. 20 | J. E. Caughey | 6.7 | 3.08 | 0.61 | 1.82 | 1.91 |
| Oct. 8 | do *a* | 4.5 | 1.71 | 1.65 | 2.49 | 2.80 |
| Oct. 23 | do *a* | 4.3 | 1.50 | 0.98 | 2.43 | 1.47 |

*a* New station one mile downstream.

DAILY GAUGE HEIGHT AND DISCHARGE of Skull Creek at Doyle's Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.19 | 28.00 | 1.63 | 0.18 | 1.95*a* | 6.0 |
| 2 | ..... | ..... | 3.19 | 40.00 | 1.63*a* | 0.18 | 1.95 | 6.0 |
| 3 | ..... | ..... | 3.23 | 80.00*b* | 1.63 | 0.18 | 1.95 | 6.0 |
| 4 | ..... | ..... | 2.87 | 76.00*c* | 1.79 | 1.86 | 1.95 | 6.0 |
| 5 | ..... | ..... | 2.67 | 61.00 | 1.79 | 1.86 | 1.92*a* | 4.9 |
| 6 | ..... | ..... | 2.65 | 59.00 | 1.76 | 1.44 | 1.90 | 4.2 |
| 7 | ..... | ..... | 2.60 | 54.00 | 1.79 | 1.86 | 1.87 | 3.5 |
| 8 | ..... | ..... | 2.53 | 47.00 | 1.78 | 1.72 | 1.89 | 4.0 |
| 9 | ..... | ..... | 2.30 | 26.00 | 1.75 | 1.30 | 1.90 | 4.2 |
| 10 | ..... | ..... | 2.15 | 15.50 | 1.75 | 1.30 | 1.92 | 4.9 |
| 11 | ..... | ..... | 1.98 | 7.10 | 1.75 | 1.30 | 1.92 | 4.9 |
| 12 | ..... | ..... | 1.94*a* | 5.60 | 1.75 | 1.30 | 1.94*a* | 5.6 |
| 13 | ..... | ..... | 1.91 | 4.60 | 1.75 | 1.30 | 1.95*a* | 6.0 |
| 14 | ..... | ..... | 1.85 | 3.10 | 2.10 | 12.50 | 1.96 | 6.4 |
| 15 | ..... | ..... | 1.85 | 3.10 | 2.33 | 29.00 | 1.90 | 4.2 |
| 16 | ..... | ..... | 1.79 | 1.86 | 2.12 | 13.70 | 1.87 | 3.5 |
| 17 | ..... | ..... | 1.79 | 1.86 | 1.98*a* | 7.10 | 1.88 | 3.8 |
| 18 | ..... | ..... | 1.76*a* | 1.44 | 1.85 | 3.10 | 1.90 | 4.2 |
| 19 | 2.03 | 3.4 | 1.74 | 1.16 | 1.87 | 3.50 | 2.05 | 10.2 |
| 20 | 1.90 | 3.3*b* | 1.74 | 1.16 | 1.87 | 3.50 | 1.98 | 7.1 |
| 21 | 2.29 | 5.0 | 1.72 | 0.88 | 1.86 | 3.30 | 1.96 | 6.4 |
| 22 | 2.38 | 6.0 | 1.71 | 0.74 | 1.85 | 3.10 | 1.95 | 6.0 |
| 23 | 2.44 | 8.0 | 1.71 | 0.74 | 1.85*a* | 3.10 | 1.96 | 6.4 |
| 24 | 2.39 | 10.0*b* | 1.69 | 0.54 | 1.86 | 3.30 | 1.97*a* | 6.7 |
| 25 | 2.44 | 11.6*c* | 1.68*a* | 0.48 | 1.95 | 6.00 | 1.99 | 7.4 |
| 26 | 2.68 | 18.0*b* | 1.68 | 0.48 | 2.25 | 22.00 | 2.25 | 22.0 |
| 27 | 2.37 | 24.0 | 1.66 | 0.36 | 1.93 | 5.30 | 1.98 | 7.1 |
| 28 | 2.32*a* | 30.0 | 1.64 | 0.24 | 1.94*a* | 5.60 | 1.98 | 7.1 |
| 29 | 2.27 | 36.0 | 1.64 | 0.24 | 1.95 | 6.00 | 1.92 | 4.9 |
| 30 | 1.95 | 20.0 | 1.63 | 0.18 | 1.95 | 6.00 | 1.98 | 7.1 |
| 31 | 1.89 | 20.0 | ..... | ..... | 1.95*a* | 6.00 | ..... | ..... |

*a* Gauge height interpolated.
*b* Discharge estimated.
*c* Actual measurements.

DAILY GAUGE HEIGHT AND DISCHARGE of Skull Creek at Doyle's Ranch, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.90 | 4.2 | 1.87*a* | 3.50 | 2.32 | 0.65 | 2.55 | 4.00 |
| 2 | 1.95 | 6.0 | 1.87 | 3.50 | 2.32 | 0.65 | 2.52 | 3.40 |
| 3 | 1.93 | 5.3 | 1.85*a* | 3.10 | 2.35 | 1.04 | 2.65 | 6.20 |
| 4 | 1.93 | 5.3 | 1.85 | 3.10 | 2.35 | 1.04 | 2.60 | 5.00 |
| 5 | 1.91*a* | 4.6 | 1.85 | 3.10 | 2.36 | 1.15 | 2.55 | 4.00 |
| 6 | 1.90 | 4.2 | 1.85 | 3.10 | 2.36 | 1.15 | 2.58 | 4.60 |
| 7 | 1.87 | 3.6 | 1.84 | 2.90 | 2.36 | 1.15 | 2.57 | 4.40 |
| 8 | 2.06 | 10.6 | 1.85 | 3.10 | 2.36 | 1.15 | 2.45 | 2.30 |
| 9 | 1.98*a* | 7.1 | 1.85 | 3.10 | 2.36 | 1.15 | 2.49 | 2.90 |
| 10 | 1.90 | 4.2 | 1.82 | 2.40 | 2.36 | 1.15 | 2.49 | 2.90 |
| 11 | 1.85 | 3.1 | 1.75 | 1.30 | 2.36 | 1.15 | 2.48 | 2.70 |
| 12 | 1.90*a* | 4.2 | 1.75 | 1.30 | 2.35 | 1.04 | 2.45 | 2.30 |
| 13 | 1.95 | 6.0 | 1.73 | 1.02 | 2.37 | 1.26 | 2.44 | 2.10 |
| 14 | 2.02 | 8.7 | 1.73*a* | 1.02 | 2.37 | 1.26 | 2.44 | 2.10 |
| 15 | 1.95 | 6.0 | 1.73*a* | 1.02 | 2.37 | 1.26 | 2.42 | 1.87 |
| 16 | 1.94*a* | 5.6 | 1.72 | 0.88 | 2.37*a* | 1.26 | 2.42 | 1.87 |
| 17 | 1.92 | 4.9 | 1.71 | 0.74 | 2.37 | 1.26 | 2.42 | 1.87 |
| 18 | 1.92 | 4.9 | 1.71*a* | 0.74 | 2.37 | 1.26 | 2.42 | 1.87 |
| 19 | 1.92 | 4.9 | 1.71 | 0.74 | 2.45 | 2.30 | 2.42 | 1.87 |
| 20 | 1.87 | 3.5 | 1.71*a* | 0.74 | 2.60 | 5.00 | 2.42 | 1.87 |
| 21 | 1.87 | 3.5 | 1.71 | 0.74 | 2.37 | 1.26 | 2.43 | 2.00 |
| 22 | 1.88*a* | 3.8 | 1.71*a* | 0.74 | 2.37*a* | 1.26 | 2.42*a* | 1.87 |
| 23 | 1.89*a* | 4.0 | 1.72 | 0.88 | 2.37 | 1.26 | 2.42 | 1.87 |
| 24 | 1.90 | 4.2 | 1.73 | 1.02 | 2.37 | 1.26 | 2.42 | 1.87 |
| 25 | 1.90*a* | 4.2 | 1.72 | 0.88 | 2.40 | 1.60 | 2.42*a* | 1.87 |
| 26 | 1.90 | 4.2 | 1.71*a* | 0.74 | 2.45 | 2.30 | 2.42 | 1.87 |
| 27 | 1.90 | 4.2 | 1.70 | 0.60 | 2.48 | 2.70 | 2.42 | 1.87 |
| 28 | 1.95 | 6.0 | 2.30*b* | 0.56 | 2.50 | 3.10 | 2.42 | 1.87 |
| 29 | 1.90 | 4.2 | 2.31 | 0.61 | 2.50 | 3.10 | 2.43 | 2.00 |
| 30 | 1.87 | 3.5 | 2.31 | 0.61 | 2.45 | 2.30 | 2.43 | 2.00 |
| 31 | 1.87*a* | 3.5 | 2.31 | 0.61 | ..... | ..... | 2.43*c* | 2.00 |

*a* Gauge height interpolated.
*b* to *c* New station.

MONTHLY DISCHARGE of Skull Creek at Doyle's Ranch, for 1915.

(Drainage area 19 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (19-31) | 36.0 | 3.30 | 15.00 | 0.789 | 0.38 | 387 |
| April | 80.0 | 0.18 | 17.40 | 0.916 | 1.02 | 1,035 |
| May | 29.0 | 0.18 | 5.10 | 0.268 | 0.31 | 314 |
| June | 22.0 | 3.50 | 6.20 | 0.326 | 0.36 | 369 |
| July | 10.6 | 3.50 | 4.90 | 0.258 | 0.30 | 301 |
| August | 3.5 | 0.56 | 1.55 | 0.082 | 0.09 | 95 |
| September | 5.0 | 0.65 | 1.57 | 0.083 | 0.09 | 93 |
| October | 6.2 | 1.87 | 2.60 | 0.137 | 0.16 | 160 |
| The period | ..... | ..... | ..... | ..... | 2.71 | 2,754 |

MANN DITCH NEAR SKULL CREEK.

*Location.*—On the NW. ¼ Sec. 32, Tp. 10, Rge. 22, W. 3rd Mer., about one mile from Skull Creek Post Office.

*Records available.*—July 1, 1913, to October 31, 1915. No water used previous to 1915.

*Gauge.*—Vertical staff. Zero maintained at elevation 98.10 feet since establishment.

*Bench-mark.*—Wooden plug on right bank of ditch. Assumed elevation 100.00 feet.

*Discharge measurements.*—Made with meter or weir.

*Observer.*—James Mann.

DISCHARGE MEASUREMENTS of Mann Ditch near Skull Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 4 | J. E. Caughey | 3.2 | 3.84 | 0.80 | 1.28 | 3.08 |
| April 13 | do | | | | 0.38 | 0.20*a* |
| July 23 | do | | | | Dry. | Nil. |

*a* Estimated.

DAILY GAUGE HEIGHT AND DISCHARGE of Mann Ditch near Skull Creek, for 1915.

| Day. | April. | | May. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | | | | |
| 2 | 1.20*a* | 2.65 | | |
| 3 | 1.20 | 2.65 | | |
| 4 | 1.20 | 2.65 | | |
| 5 | 1.20 | 2.65 | | |
| 6 | 1.20 | 2.65 | | |
| 7 | 1.20 | 2.65 | | |
| 8 | 1.10 | 2.25 | | |
| 9 | 1.00 | 1.85 | | |
| 10 | 0.80 | 1.20 | | |
| 11 | 0.70 | 0.90 | | |
| 12 | 0.40 | 0.21 | | |
| 13 | 0.38 | 0.18 | | |
| 14 | | | | |
| 15 | | | 0.90*a* | 1.50 |
| 16 | | | 0.60 | 0.64 |
| 17 | | | 0.50 | 0.40 |
| 18 | | | 0.20*b* | Nil |
| 19 | | | | |
| 20 | | | | |
| 21 | | | | |
| 22 | | | | |
| 23 | | | | |
| 24 | | | | |
| 25 | | | | |
| 26 | | | | |
| 27 | | | | |
| 28 | | | | |
| 29 | | | | |
| 30 | | | | |
| 31 | | | | |

*a* Headgates opened.
*b* Headgates closed.

MONTHLY DISCHARGE of Mann Ditch near Skull Creek, for 1915.

| MONTH. | DISCHARGE IN SECOND-FEET. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| April (2-13) | 2.65 | 0.18 | 1.87 | 44 |
| May (15-18) | 1.50 | Nil. | 0.63 | 5 |
| The period | | | | 49 |

GORDON, IRONSIDES AND FARES DITCH NEAR PIAPOT.

*Location.*—On the N.W. ¼ Sec. 7, Tp. 12, Rge. 22, W. 3rd Mer., about three miles southeast of Crane Lake station.

*Gauge.*—Vertical staff, situated on the right side of the ditch about 500 feet below the headgate. Zero elevation maintained at 94.01 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark; also used as initial point of soundings, on the left side of the ditch and 5.5 feet below the gauge. Assumed elevation, 100.00 feet.

*Channel.*—One channel, light sandy loam bed.

*Discharge measurements.*—Made with meter or weir.

*Observer.*—Gordon, Ironsides and Fares.

*Remarks.*—This station was established on June 14, 1915, by M. Gurofsky. One measurement was obtained by M. H. French on June 12, 1915.

DISCHARGE MEASUREMENTS of Gordon, Ironsides and Fares Ditch near Piapot, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| June 12 | M. H. French | 6 | 3.14 | 0.76 | 0.77 | 2.4 |

## CRANE LAKE DRAINAGE BASIN

### *General Description.*

Crane Lake is one of the largest of the lakes which receive their supply from the drainage of the northern slope of the Cypress Hills. It is situated in Township 13, Range 23, West of the 3rd Meridian and covers an area of some twenty-five square miles.

The lake has no outlet, is shallow, and the water is saline in character. It is fed by Piapot Creek, which rises in the Cypress Hills, flows northeastward, and is joined by Bear Creek in Section 7, Township 12, Range 22, West of the 3rd Meridian before it reaches the lake.

The country to the north of the lake is rolling and of little use for agriculture, being the eastern end of a range of sand hills which extend northwestward some forty miles. South of the lake the country is rolling prairie, which is bare of tree growth, except along the creeks where there is a small growth of willow and shrub. As it gets closer to the hills the country becomes more broken and the tree growth increases, making the ravines and coulees at the head of the creeks natural reservoirs which regulate the spring run-off considerably.

There are a number of irrigation schemes in operation and proposed, in this basin, also one or two industrial schemes along the main line of the Canadian Pacific Railway.

The mean annual precipitation of the northern part of the basin is about twelve inches, but in the hills this is exceeded. During the winter season from November to April, the streams are frozen over.

BEAR CREEK AT UNSWORTH'S RANCH.

*Location.*—On the SE. ¼ Sec. 18, Tp. 11, Rge. 23, W. 3rd Mer., at bridge about four miles from Piapot.

*Records available.*—June 22, 1908, to October 31, 1915.

*Gauge.*—Vertical staff. Zero elevation has been maintained at 85.95 feet since establishment.

*Bench-mark.*—A circle of nails on the top of the stringer at the left abutment of the bridge on the downstream side. Assumed elevation, 100.00 feet.

*Discharge measurements.*—Made with meter from the bridge; by wading or with a weir at low stages.

*Winter flow.*—This station is not maintained during winter.

*Observer.*—Miss A. Unsworth.

DISCHARGE MEASUREMENTS of Bear Creek at Unsworth's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 24 | J. E. Caughey | 18.0 | 25.10 | 1.10 | 4.67 | 27.70 |
| Mar. 26 | do | 19.0 | 22.80 | 0.70 | 3.55 | 15.90 |
| April 2 | do | 30.0 | 51.00 | 0.63 | 4.01 | 32.50 |
| April 4 | do | 37.4 | 220.70 | 1.53 | 11.42 | 338.00 |
| April 10 | do | 28.0 | 43.10 | 0.90 | 3.24 | 38.00 |
| April 12 | do | 25.0 | 29.80 | 0.98 | 2.83 | 28.00 |
| April 13 | do | 26.0 | 30.20 | 0.90 | 2.80 | 28.00 |
| May 1 | do | 9.0 | 13.15 | 0.79 | 1.79 | 10.40 |
| May 21 | do | 8.5 | 16.40 | 1.04 | 2.14 | 17.10 |
| May 31 | do | 8.5 | 13.00 | 0.98 | 1.87 | 12.80 |
| June 5 | do | 15.0 | 23.40 | 1.18 | 3.14 | 28.00 |
| June 26 | do | 14.0 | 18.40 | 1.12 | 2.65 | 21.00 |
| July 22 | do | 11.5 | 11.77 | 0.56 | 1.60 | 6.60 |
| Aug. 14 | do | 12.0 | 9.60 | 0.16 | 1.10 | 1.58 |
| Sept. 4 | G. H. Whyte and J. E. Caughey | 17.0 | 19.50 | 0.22 | 1.47 | 4.20 |
| Sept. 18 | J. E. Caughey | 17.0 | 19.75 | 0.24 | 1.57 | 4.90 |
| Oct. 6 | do | 18.0 | 24.10 | 0.32 | 1.94 | 7.90 |
| Oct. 21 | do | 18.0 | 22.00 | 0.29 | 1.80 | 6.60 |

DAILY GAUGE HEIGHT AND DISCHARGE of Bear Creek at Unsworth's Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | | | 3.97 | 50.0*b* | 1.80 | 10.2 | 1.87 | 7.6 |
| 2 | | | 4.20 | 32.5*a* | 1.80 | 10.2 | 2.60 | 18.6 |
| 3 | | | 7.82 | 180.0*b* | 1.80 | 10.2 | 2.86 | 23.3 |
| 4 | | | 11.10 | 338.0*a* | 1.80 | 10.2 | 3.00 | 26.0 |
| 5 | | | 8.20 | 200.0 | 1.80 | 10.2 | 3.25 | 31.0 |
| 6 | | | 6.05 | 114.0 | 1.77 | 9.7 | 3.00 | 26.0 |
| 7 | | | 4.50 | 68.0 | 1.75 | 9.4 | 2.60 | 18.6 |
| 8 | | | 3.90 | 50.0 | 1.73 | 9.1 | 2.45 | 15.9 |
| 9 | | | 3.50 | 42.0 | 1.70 | 8.6 | 2.30 | 13.4 |
| 10 | | | 3.25 | 37.0 | 1.70 | 8.6 | 2.10 | 10.4 |
| 11 | | | 3.00 | 32.0 | 1.67 | 8.2 | 2.25 | 12.6 |
| 12 | | | 2.83 | 29.0 | 1.65 | 7.9 | 2.30 | 13.4 |
| 13 | | | 2.90 | 30.0 | 1.65 | 7.9 | 2.25 | 12.6 |
| 14 | | | 2.83 | 29.0 | 2.20 | 17.0 | 2.20 | 11.[illegible] |
| 15 | | | 2.63 | 25.0 | 3.05 | 33.0 | 2.15 | 11.2 |
| 16 | | | 2.60 | 24.0 | 4.95 | 32.0 | 2.17 | 11.4 |
| 17 | | | 2.41 | 21.0 | 3.47 | 41.0 | 2.00 | 9.2 |
| 18 | | | 2.43 | 21.0 | 2.80 | 28.0 | 1.95 | 8.6 |
| 19 | | | 2.30 | 18.8 | 2.47 | 22.0 | 2.10 | 10.4 |
| 20 | 2.09 | 6.00*b* | 2.27 | 18.3 | 2.40 | 21.0 | 2.90 | 24.0 |
| 21 | 3.08 | 6.00*b* | 2.23 | 17.5 | 2.25 | 17.0 | 2.60 | 18.6 |
| 22 | 3.67 | 8.00*b* | 2.17 | 16.5 | 2.00 | 14.5 | 2.57 | 18.1 |
| 23 | 4.38 | 20.00*b* | 2.14 | 15.9 | 1.97 | 13.0 | 2.53 | 17.7 |
| 24 | 4.65 | 27.70*a* | 2.10 | 15.2 | 1.90 | 11.8 | 2.55 | 17.7 |
| 25 | 4.40 | 20.00*b* | 2.03 | 14.0 | 2.00 | 13.5 | 2.40 | 16.8 |
| 26 | 3.70 | 15.90*a* | 2.04 | 13.7 | 2.10 | 15.2 | 2.60 | 18.6 |
| 27 | 3.65 | 16.00*b* | 2.00 | 13.5 | 2.70 | 26.0 | 2.65 | 19.5 |
| 28 | 3.45 | 20.00*b* | 1.97 | 13.0 | 2.45 | 22.0 | 2.[illegible] | 13.4 |
| 29 | 2.80 | 28.00*b* | 1.95 | 12.6 | 2.10 | 15.2 | 2.25 | 12.6 |
| 30 | 2.75 | 26.00*b* | 1.83 | 10.7 | 2.00 | 13.5 | 2.[illegible] | 11.9 |
| 31 | 3.40 | 32.00*b* | | | 1.87 | 11.8 | | |

*a* Actual measurements.
*b* Discharge estimated.

DAILY GAUGE HEIGHT AND DISCHARGE of Bear Creek at Unsworth's Ranch, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.15 | 11.2 | 1.60 | 4.80 | 1.20 | 1.90 | 1.90 | 8.0 |
| 2 | 2.10 | 10.4 | 1.55 | 4.40 | 1.25 | 2.20 | 1.90 | 8.0 |
| 3 | 2.00 | 9.2 | 1.45 | 3.60 | 1.37 | 3.10 | 2.10 | 10.4 |
| 4 | 1.97 | 8.8 | 1.35 | 3.00 | 1.40 | 3.30 | 2.00 | 9.2 |
| 5 | 1.87 | 7.6 | 1.27 | 2.40 | 1.40 | 3.30 | 2.10 | 10.4 |
| 6 | 1.80 | 6.8 | 1.25 | 2.20 | 1.40 | 3.30 | 2.15 | 11.2 |
| 7 | 2.05 | 9.8 | 1.25 | 2.20 | 1.37 | 3.10 | 2.12 | 10.7 |
| 8 | 2.20 | 11.9 | 1.13 | 1.41 | 1.45 | 3.60 | 2.10 | 10.4 |
| 9 | 2.55 | 17.7 | 1.10 | 1.20 | 1.57 | 4.60 | 2.10 | 10.4 |
| 10 | 2.45 | 15.9 | 1.05 | 0.90 | 1.50 | 4.00 | 2.25 | 12.6 |
| 11 | 1.95 | 8.6 | 1.05 | 0.90 | 1.47 | 3.80 | 2.30 | 13.4 |
| 12 | 1.80 | 6.8 | 1.03 | 0.78 | 1.55 | 4.40 | 2.20 | 11.9 |
| 13 | 1.90 | 8.0 | 1.00 | 0.60 | 1.65 | 5.30 | 2.15 | 11.2 |
| 14 | 2.10 | 10.4 | 1.10 | 1.20 | 1.65 | 5.30 | 2.15 | 11.2 |
| 15 | 2.00 | 9.2 | 1.80 | 6.80 | 1.65 | 5.30 | 2.10 | 10.4 |
| 16 | 2.05 | 9.8 | 1.70 | 5.80 | 1.63 | 5.10 | 2.00 | 9.2 |
| 17 | 2.00 | 9.2 | 1.55 | 4.40 | 1.60 | 4.80 | 1.95 | 8.6 |
| 18 | 2.00 | 9.2 | 1.25 | 2.20 | 1.57 | 4.60 | 1.90 | 8.0 |
| 19 | 1.95 | 8.6 | 1.03 | 0.78 | 1.65 | 5.30 | 1.90 | 8.0 |
| 20 | 1.80 | 6.8 | 1.10 | 1.20 | 1.80 | 6.80 | 1.95 | 8.6 |
| 21 | 1.75 | 6.3 | 1.25 | 2.20 | 1.82 | 7.00 | 1.80 | 6.8 |
| 22 | 1.60 | 4.8 | 1.30 | 2.60 | 1.80 | 6.80 | 2.00 | 9.2 |
| 23 | 2.20 | 11.9 | 1.25 | 2.20 | 1.78 | 6.60 | 2.00 | 9.2 |
| 24 | 2.35 | 14.2 | 1.20 | 1.90 | 1.78 | 6.60 | 2.00 | 9.2 |
| 25 | 2.30 | 13.4 | 1.15 | 1.55 | 1.75 | 6.30 | 2.05 | 9.8 |
| 26 | 2.15 | 11.2 | 1.12 | 1.34 | 1.75 | 6.30 | 2.05 | 9.8 |
| 27 | 2.05 | 9.8 | 1.20 | 1.90 | 1.75 | 6.30 | 2.00 | 9.2 |
| 28 | 1.95 | 8.6 | 1.30 | 2.60 | 1.75 | 6.30 | 2.00 | 9.2 |
| 29 | 1.80 | 6.8 | 1.27 | 2.40 | 1.80 | 6.80 | 1.97 | 8.8 |
| 30 | 1.77 | 6.5 | 1.23 | 2.10 | 1.85 | 7.40 | 1.95 | 8.6 |
| 31 | 1.65 | 5.3 | 1.20 | 1.90 | ..... | ..... | 2.00 | 9.2 |

MONTHLY DISCHARGE of Bear Creek at Unsworth's Ranch, for 1915.

(Drainage area 100 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (20–31) | 32.0 | 6.00 | 18.9 | 0.189 | 0.08 | 450 |
| April | 338.0 | 10.70 | 50.0 | 0.500 | 0.56 | 2,975 |
| May | 41.0 | 7.90 | 15.7 | 0.157 | 0.18 | 965 |
| June | 31.0 | 7.60 | 16.0 | 0.160 | 0.18 | 952 |
| July | 17.7 | 5.30 | 9.5 | 0.095 | 0.11 | 584 |
| August | 6.8 | 0.60 | 2.4 | 0.024 | 0.03 | 148 |
| September | 7.4 | 1.90 | 5.0 | 0.050 | 0.06 | 298 |
| October | 13.4 | 6.80 | 9.7 | 0.097 | 0.11 | 596 |
| The period | ..... | ..... | ..... | ..... | 1.31 | 6,968 |

NEEDHAM BROTHERS DITCH FROM BEAR CREEK.

*Location.*—On the SW. ¼ Sec. 30, Tp. 11, Rge. 23, W. 3rd Mer., about two miles south of Piapot.

*Records available.*—Discharge measurements only from 1911 to 1914 and complete records during the irrigation season of 1915.

*Gauge.*—Vertical staff. Zero elevation maintained at 88.63 feet since establishment.

*Bench-mark.*—A broad arrow cut in the top of the right hand support of the bridge on the downstream side. Assumed elevation, 100.00 feet.

*Channel.*—One channel at all stages.

*Discharge measurements.*—Made with a weir or current-meter.

*Observer.*—Miss M. Fauquier.

DISCHARGE MEASUREMENTS of Needham Brothers Ditch from Bear Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 1 | J. E. Caughey | 7.0 | 6.7 | 1.34 | 1.91 | 9.01 |
| June 26 | do | ..... | ..... | ..... | ..... | Dry. |

DAILY GAUGE HEIGHT AND DISCHARGE of Needham Brothers Ditch from Bear Creek, for 1915.

| Day. | April. | | May. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | | | 2.08 | 12.6 |
| 2 | | | 2.08 | 12.6 |
| 3 | | | 2.00 | 11.0 |
| 4 | | | 2.00 | 11.0 |
| 5 | | | 2.00 | 11.0 |
| 6 | | | 2.08 | 12.6 |
| 7 | | | 2.08 | 12.6 |
| 8 | | | 2.00 | 11.0 |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |
| 16 | | | | |
| 17 | | | | |
| 18 | | | | |
| 19 | | | | |
| 20 | | | | |
| 21 | | | | |
| 22 | | | | |
| 23 | | | | |
| 24 | | | | |
| 25 | | | | |
| 26 | | | | |
| 27 | | | | |
| 28 | 1.75 | 6.3 | | |
| 29 | 2.00 | 11.0 | | |
| 30 | 2.00 | 11.0 | | |
| 31 | | | | |

MONTHLY DISCHARGE of Needham Brothers Ditch from Bear Creek, for 1915.

| MONTH. | DISCHARGE IN SECOND-FEET. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| April (28-30) | 11.0 | 6.3 | 9.4 | 56 |
| May (1-8) | 12.6 | 11.0 | 11.8 | 187 |
| The period | ..... | ..... | ..... | 243 |

BRANIFF DITCH FROM BEAR CREEK.

*Location.*—On the SE. ¼ Sec. 30, Tp. 11, Rge. 23, W. 3rd Mer.
*Records available.*—One discharge measurement in 1914. No discharge recorded in 1915.
*Gauge.*—Vertical staff, at headgate. Elevation of zero 95.91 feet.
*Bench-mark.*—Stump on right bank. Assumed elevation, 100.00 feet.
*Discharge measurements.*—Made by wading.
*Observer.*—No observations in 1915.

MCCARTHY, BERTRAM AND SALT WEST DITCH FROM BEAR CREEK.

*Location.*—On the NW. ¼ Sec. 29, Tp. 11, Rge. 23, W. 3rd Mer., about three hundred feet down-stream from the dam.
*Records available.*—Discharge measurements only in 1914. Records for irrigation season of 1915.
*Gauge.*—Vertical staff. Zero elevation maintained at 96.84 feet since establishment.
*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.
*Channel.*—Clay with a growth of vegetation.
*Discharge measurements.*—Made with current-meter or weir.
*Observer.*—W. Salt.

DISCHARGE MEASUREMENTS of McCarthy, Bertram and Salt West Ditch from Bear Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 12 | J. E. Caughey | 8.0 | 11.65 | 1.07 | 2.09 | 12.4 |
| May 31 | do | ..... | ..... | ..... | ..... | Dry. |
| June 26 | do | ..... | ..... | ..... | ..... | " |

DAILY GAUGE HEIGHT AND DISCHARGE of McCarthy, Bertram and Salt West Ditch from Bear Creek, for 1915.

| Day. | April. | |
|---|---|---|
| | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... |
| 2 | ..... | ..... |
| 3 | ..... | ..... |
| 4 | ..... | ..... |
| 5 | ..... | ..... |
| 6 | ..... | ..... |
| 7 | 1.80*a* | 8.0 |
| 8 | 1.85 | 8.7 |
| 9 | 2.00 | 10.9 |
| 10 | 2.09 | 12.3 |
| 11 | 2.09 | 12.3 |
| 12 | 2.09 | 12.3 |
| 13 | 2.00 | 10.9 |
| 14 | 1.89 | 9.2 |
| 15 | 1.79 | 7.9 |
| 16 | 1.59 | 5.5 |
| 17 | 1.59 | 5.5 |
| 18 | 1.59 | 5.5 |
| 19 | 1.59 | 5.5 |
| 20 | 1.59 | 5.5 |
| 21 | 1.59 | 5.5 |
| 22 | 1.59*b* | 5.5 |
| 23 | ..... | ..... |
| 24 | ..... | ..... |
| 25 | ..... | ..... |
| 26 | ..... | ..... |
| 27 | ..... | ..... |
| 28 | ..... | ..... |
| 29 | ..... | ..... |
| 30 | ..... | ..... |
| 31 | ..... | ..... |

*a* Ditch turned on.
*b* Ditch turned off.

MONTHLY DISCHARGE of McCarthy, Bertram and Salt West Ditch from Bear Creek, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre feet. |
|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | |
| April (7-22) | 12.3 | 5.5 | 8.2 | 260 |
| The period | ..... | ..... | ..... | 260 |

MCCARTHY, BERTRAM AND SALT EAST DITCH FROM BEAR CREEK.

*Location.*—On the NW. ¼ Sec. 29, Tp. 11, Rge. 23, W. 3rd Mer., near Piapot and 300 feet northeast of dam and 75 feet below headgate.
*Records available.*—For irrigation season of 1915.
*Gauge.*—Vertical staff. Zero elevation maintained at 97.73 feet since establishment.
*Bench-mark.*—Permanent iron bench-mark near the dam. Assumed elevation, 100.00 feet.
*Channel.*—Clay, with a heavy growth of vegetation.
*Discharge measurements.*—Made with current-meter or weir.
*Observer.*—W. Salt.

DISCHARGE MEASUREMENTS of McCarthy, Bertram and Salt East Ditch from Bear Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 12 | J. E. Caughey | 11.0 | 21.15 | 0.61 | 2.91 | 13.00 |
| May 31 | do | ..... | ..... | ..... | 0.58 | Nil.*a* |
| June 26 | do | ..... | ..... | ..... | ..... | Dry. |

*a* Water standing in pools.

DAILY GAUGE HEIGHT AND DISCHARGE of McCarthy, Bertram and Salt East Ditch from Bear Creek, for 1915.

| Day. | April. | |
|---|---|---|
| | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... |
| 2 | ..... | ..... |
| 3 | ..... | ..... |
| 4 | ..... | ..... |
| 5 | ..... | ..... |
| 6 | ..... | ..... |
| 7 | 1.62*a* | 3.9 |
| 8 | 2.80 | 12.0 |
| 9 | 2.82 | 12.2 |
| 10 | 2.80 | 12.0 |
| 11 | 2.90 | 13.0 |
| 12 | 2.91 | 13.1 |
| 13 | 2.90 | 13.0 |
| 14 | 2.92 | 13.2 |
| 15 | 2.80 | 12.0 |
| 16 | 2.72 | 11.3 |
| 17 | 3.22 | 16.2 |
| 18 | 3.22 | 16.2 |
| 19 | 3.20 | 16.0 |
| 20 | 3.10 | 15.0 |
| 21 | 2.96 | 13.6 |
| 22 | 2.90*b* | 13.0 |
| 23 | ..... | ..... |
| 24 | ..... | ..... |
| 25 | ..... | ..... |
| 26 | ..... | ..... |
| 27 | ..... | ..... |
| 28 | ..... | ..... |
| 29 | ..... | ..... |
| 30 | ..... | ..... |
| 31 | ..... | ..... |

*a* Ditch turned on.
*b* Ditch turned off.

MONTHLY DISCHARGE of McCarthy, Bertram and Salt East Ditch from Bear Creek, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | |
| April (7-22) | 16.2 | 3.9 | 12.9 | 409 |
| The period | ..... | ..... | ..... | 409 |

### TRANTER SOUTH DITCH NEAR MAPLE CREEK.

*Location.*—On the NW. ¼ Sec. 5, Tp. 10, Rge. 24, W. 3rd Mer.

*Gauge*—Vertical staff, located 450 feet below headgate on the left side of the ditch. Zero elevation maintained at 97.22 feet since establishment.

*Bench-mark.*—A wooden plug surrounded by stones on right bank of ditch, four feet upstream from gauge. Assumed elevation, 100.00 feet.

*Channel.*—One at all stages, gravel bed.

*Discharge measurements.*—Made with meter or weir.

*Observer.*—G. Tranter.

*Remarks.*—This station was established on May 20, 1915, by R. B. Williamson, but no records were obtained in 1915.

### TRANTER NORTH DITCH NEAR MAPLE CREEK.

*Location.*—On the SW. ¼ Sec. 18, Tp. 10, Rge. 24, W. 3rd Mer.

*Gauge.*—Vertical staff, located 800 feet below the headgate, on left side of ditch. Zero elevation maintained at 98.88 feet since establishment.

*Bench-mark.*—A six-inch log surrounded by stones on right side of ditch and five feet upstream from gauge. Assumed elevation, 100.00 feet.

*Channel.*—One at all stages. Bed clean.

*Discharge measurements.*—Made with meter or weir.

*Observer.*—G. Tranter.

*Remarks.*—This station was established on May 20, 1915, by R. B. Williamson, but no records were obtained in 1915.

### BEVERIDGE WEST DITCH FROM PIAPOT CREEK.

*Location.*—On the NW. ¼ Sec. 18, Tp. 10, Rge. 24, W. 3rd Mer., about 350 feet below point of intake.

*Records available.*—Irrigation seasons June, 5, 1911, to October 31, 1915.

*Gauge.*—Vertical staff. Zero elevation maintained at 97.82 feet during 1915.

*Bench-mark.*—Top of wooden post used as I. P. Assumed elevation, 100.00 feet.

*Channel.*—Clay and gravel, permanent.

*Control.*—A permanent control has been placed on this ditch below the gauge.

*Discharge measurements.*—Made with meter or weir.

*Observer.*—D. Beveridge.

DISCHARGE MEASUREMENTS of Beveridge West Ditch from Piapot Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 4 | J. E. Caughey | | | | | Nil |
| May 20 | do | 4.0 | 1.45 | 0.48 | 0.66 | 0.69 |
| May 29 | do | | | | 0.54 | 0.85 |
| June 25 | do | | | | | Nil |

DAILY GAUGE HEIGHT AND DISCHARGE of Beveridge West Ditch from Piapot Creek, for 1915.

| Day. | April. | | May. | | June. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | ..... | ..... | 0.90*a* | 1.85 |
| 3 | ..... | ..... | ..... | ..... | 0.90*c* | 1.85 |
| 3 | ..... | ..... | ..... | ..... | 0.90*c* | 1.85 |
| 4 | ..... | ..... | ..... | ..... | 0.90*c* | 1.85 |
| 5 | 0.90*a* | 1.85 | ..... | ..... | 0.90 | 1.85 |
| 6 | 0.90 | 1.85 | ..... | ..... | 0.85 | 1.58 |
| 7 | 0.90*c* | 1.85 | ..... | ..... | 0.80 | 1.30 |
| 8 | 0.90 | 1.85 | ..... | ..... | 0.80 | 1.30 |
| 9 | 0.90 | 1.85 | ..... | ..... | 0.80 | 1.30 |
| 10 | 0.90*b* | 1.85 | ..... | ..... | 0.80 | 1.30 |
| 11 | ..... | ..... | ..... | ..... | 0.80 | 1.30 |
| 12 | ..... | ..... | ..... | ..... | 0.80 | 1.30 |
| 13 | ..... | ..... | ..... | ..... | 0.80 | 1.30 |
| 14 | ..... | ..... | ..... | ..... | 0.80 | 1.30 |
| 15 | ..... | ..... | ..... | ..... | 0.80 | 1.30 |
| 16 | ..... | ..... | ..... | ..... | 0.80 | 1.30 |
| 17 | ..... | ..... | ..... | ..... | 0.80 | 1.30 |
| 18 | ..... | ..... | 1.20*a* | 3.60 | 0.80 | 1.30 |
| 19 | ..... | ..... | 1.10 | 3.00 | 0.80 | 1.30 |
| 20 | ..... | ..... | 0.70 | 0.84 | ..... | ..... |
| 21 | ..... | ..... | 0.70 | 0.84 | ..... | ..... |
| 22 | ..... | ..... | 0.60 | 0.50 | ..... | ..... |
| 23 | ..... | ..... | 0.70*c* | 0.84 | ..... | ..... |
| 24 | ..... | ..... | 0.80 | 1.30 | ..... | ..... |
| 25 | ..... | ..... | 0.80 | 1.30 | ..... | ..... |
| 26 | ..... | ..... | 0.80 | 1.30 | ..... | ..... |
| 27 | ..... | ..... | 0.70 | 0.84 | ..... | ..... |
| 28 | ..... | ..... | 0.60*c* | 0.50 | ..... | ..... |
| 29 | ..... | ..... | 0.54*b* | 0.37 | ..... | ..... |
| 30 | ..... | ..... | ..... | ..... | ..... | ..... |
| 31 | ..... | ..... | ..... | ..... | ..... | ..... |

*a* Headgates cepned.
*b* Headgates closed.
*c* Gauge height interpolated

MONTHLY DISCHARGE of Beveridge West Ditch from Piapot Creek, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| April (5–10) | 1.85 | 1.85 | 1.85 | 22 |
| May (18–29) | 3.60 | 0.37 | 1.27 | 30 |
| June (1–19) | 1.85 | 1.30 | 1.46 | 55 |
| The period | ..... | ..... | ..... | 107 |

MOORHEAD DITCH FROM PIAPOT CREEK.

*Location.*—On the SE. ¼ Sec. 25, Tp. 10, Rge. 25, W. 3rd Mer., near the centre of the quarter-section and about 400 feet from the intake of the ditch.

*Records available.*—Discharge measurements only 1912–14. Records for irrigation season of 1915.

*Gauge.*—Vertical staff. Zero elevation maintained at 95.42 feet since establishment.

*Bench-mark.*—On a three-inch post, used as Initial Point driven into ground about one foot from gauge and surrounded by small stones. Assumed elevation, 100.00 feet.

*Channel.*—One permanent channel. Bed consists of small rocks of about two inches in diameter.

*Discharge measurements.*—Made with current-meter or weir.

*Observer.*—H. Moorhead.

DISCHARGE MEASUREMENTS of Moorhead's Ditch from Piapot Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 21 | M. H. French | 6.5 | 3.68 | 0.69 | 1.01 | 2.6 |
| June 25 | J. E. Caughey | 5.6 | 2.68 | 0.99 | 1.01 | 2.6 |
| July 22 | do | ..... | ..... | ..... | ..... | Nil. |
| Aug. 14 | do | ..... | ..... | ..... | ..... | " |

DAILY GAUGE HEIGHT AND DISCHARGE of Moorhead's Ditch from Piapot Creek, for 1915.

| Day. | May. | | June. | | July. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.25 | 4.9 | 1.20 | 4.4 | 1.16 | 4.0 |
| 2 | 1.24*a* | 4.8 | 1.25 | 4.9 | 1.18 | 4.2 |
| 3 | 1.24 | 4.8 | 1.30 | 5.4 | 1.18 | 4.2 |
| 4 | 1.22 | 4.6 | 1.35 | 6.0 | 1.18 | 4.2 |
| 5 | 1.19 | 4.3 | 1.35 | 6.0 | 1.19 | 4.3 |
| 6 | 1.18 | 4.2 | 1.40 | 6.6 | 1.19 | 4.3 |
| 7 | 1.17*a* | 4.1 | 1.40*e* | 6.6 | 1.19 | 4.3 |
| 8 | 1.15 | 3.9 | 1.40 | 6.6 | 1.20 | 4.4 |
| 9 | 1.15*b* | 3.9 | 1.40*f* | 6.6 | 1.20*k* | 4.4 |
| 10 | 1.16 | 4.0 | 1.40 | 6.6 | 1.20 | 4.4 |
| 11 | 1.16 | 4.0 | 1.38 | 6.4 | ....*l* | ..... |
| 12 | 1.17 | 4.1 | 1.38 | 6.4 | ..... | ..... |
| 13 | 1.18 | 4.2 | 1.36 | 6.1 | ..... | ..... |
| 14 | 1.19*b* | 4.3 | 1.33 | 5.8 | ..... | ..... |
| 15 | 2.00 | 15.9 | 1.33 | 5.8 | ..... | ..... |
| 16 | 2.00*c* | 15.9 | 1.30 | 5.4 | ..... | ..... |
| 17 | 1.90 | 14.3 | 1.27 | 5.1 | ..... | ..... |
| 18 | 1.80 | 12.7 | 1.24 | 4.8 | ..... | ..... |
| 19 | 1.60 | 9.5 | 1.21 | 4.5 | ..... | ..... |
| 20 | 1.10 | 6.6 | 1.17 | 4.1 | ..... | ..... |
| 21 | 1.30*c* | 5.4 | 1.14 | 3.8 | ..... | ..... |
| 22 | 1.20 | 4.4 | 1.10 | 3.4 | ..... | ..... |
| 23 | 1.20*d* | 4.4 | 1.06 | 3.0 | ..... | ..... |
| 24 | 1.20 | 4.4 | 1.03*f* | 2.8 | ..... | ..... |
| 25 | 1.19 | 4.3 | 1.01 | 2.6 | ..... | ..... |
| 26 | 1.18 | 4.2 | 1.04*h* | 2.8 | ..... | ..... |
| 27 | 1.16 | 4.0 | 1.06 | 3.0 | ..... | ..... |
| 28 | 1.12*d* | 3.6 | 1.08*h* | 3.2 | ..... | ..... |
| 29 | 1.10 | 3.4 | 1.10 | 3.4 | ..... | ..... |
| 30 | 1.10*e* | 3.4 | 1.12*k* | 3.6 | ..... | ..... |
| 31 | 1.15 | 3.9 | ... | ... | | |

*a–a*; *b–b*; *c–c*; *d–d*; *e–e*; *f–f*; *h–h*; *k–k* Gauge heights interpolated.
*l* Headgate closed.

MONTHLY DISCHARGE of Moorhead's Ditch from Piapot Creek, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet |
|---|---|---|---|---|
| | Maximum | Minimum. | Mean. | |
| May | 15.9 | 3.4 | 5.8 | 357 |
| June | 6.6 | 2.8 | 4.9 | 292 |
| July (1–10) | 4.4 | 4.0 | 4.3 | 85 |
| The period | ..... | ..... | ..... | 734 |

FEARON DITCH NEAR PIAPOT.

*Location.*—On the SW. ¼ Sec. 6, Tp. 11, Rge. 24, W. 3rd Mer., about 1,000 feet from the point of intake.

*Records available.*—Discharge measurements taken during the irrigation seasons of 1914 and 1915.

*Gauge.*—Vertical staff. Zero maintained at elevation of 97.41 feet since establishment.

*Bench-mark.*—Top of post used as I. P. Assumed elevation, 100.00 feet.

*Channel.*—Clay, covered with grass.

*Discharge measurements.*—Made with meter or weir.

*Observer.*—Ed. Fearon.

DISCHARGE MEASUREMENTS of Fearon Ditch near Piapot, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec. ft.* |
| April 14 | J. E. Caughey | ..... | ..... | ..... | ..... | Dry. |
| May 29 | do | ..... | ..... | ..... | 0.59 | 0.18*a* |
| June 25 | do | ..... | ..... | ..... | 0.79 | 0.24*a* |
| July 22 | do | ..... | ..... | ..... | 0.58 | Nil.*a* |

*a* Weir measurement.

CUMBERLAND DITCH FROM PIAPOT CREEK.

*Location.*—On the SW. ¼ Sec. 17, Tp. 11, Rge. 24, W. 3rd Mer., about 300 feet from the headgate of the ditch.

*Records available.*—June 27, 1914, to October 31, 1915. No water used in 1914.

*Gauge.*—Vertical staff. Zero maintained at 98.00 feet since establishment.

*Bench-mark.*—Wooden stake used for I. P. Assumed elevation, 100.00 feet.

*Channel.*—Clay, fairly permanent.

*Discharge measurements.*—Made with meter or weir.

*Observer.*—Andrew Cumberland.

DISCHARGE MEASUREMENTS of Cumberland Ditch from Piapot Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 14 | J. E. Caughey | ..... | ..... | ..... | ..... | Nil. |
| May 18 | M. H. French | 5.0 | 3.21 | 0.92 | 0.90 | 2.94 |
| May 18 | do | 5.0 | 2.64 | 0.69 | 0.75 | 1.83 |
| May 18 | do | 5.0 | 2.25 | 0.64 | 0.66 | 1.44 |
| May 18 | do | ..... | ..... | ..... | 0.22 | .....*a* |
| May 28 | J. E. Caughey | 3.5 | 2.07 | 0.64 | 0.62 | 1.34 |
| June 24 | do | ..... | ..... | ..... | ..... | Nil. |

*a* Slight seepage only.

DAILY GAUGE HEIGHT AND DISCHARGE of Cumberland Ditch from Piapot Creek, for 1915.

| Day. | May. | | June. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.50 | 9.0 |
| 2 | ..... | ..... | 1.20 | 5.6 |
| 3 | ..... | ..... | 1.15*c* | 5.1 |
| 4 | ..... | ..... | 1.10*c* | 4.6 |
| 5 | ..... | ..... | 1.05*c* | 4.2 |
| 6 | ..... | ..... | 1.00 | 3.7 |
| 7 | ..... | ..... | 0.95*c* | 3.3 |
| 8 | ..... | ..... | 0.85*b* | 2.6 |
| 9 | 0.60*a* | 1.18 | ..... | ..... |
| 10 | 0.57*c* | 1.07 | ..... | ..... |
| 11 | 0.55 | 0.99 | ..... | ..... |
| 12 | 0.58*c* | 1.10 | ..... | ..... |
| 13 | 0.60 | 1.18 | ..... | ..... |
| 14 | 0.90 | 2.90 | ..... | ..... |
| 15 | 1.20 | 5.60 | ..... | ..... |
| 16 | 1.30 | 6.70 | ..... | ..... |
| 17 | 1.10 | 4.69 | ..... | ..... |
| 18 | 0.80 | 2.20 | ..... | ..... |
| 19 | 0.70 | 1.64 | ..... | ..... |
| 20 | 0.68*c* | 1.55 | ..... | ..... |
| 21 | 0.66*c* | 1.46 | ..... | ..... |
| 22 | 0.65 | 1.41 | ..... | ..... |
| 23 | 0.65 | 1.41 | ..... | ..... |
| 24 | 0.75*c* | 1.93 | ..... | ..... |
| 25 | 0.90*c* | 2.90 | ..... | ..... |
| 26 | 1.00 | 3.70 | ..... | ..... |
| 27 | 0.60 | 1.18 | ..... | ..... |
| 28 | 0.62 | 1.27 | ..... | ..... |
| 29 | 0.80*c* | 2.20 | ..... | ..... |
| 30 | 1.00*c* | 3.70 | ..... | ..... |
| 31 | 1.25*c* | 6.20 | ..... | ..... |

*a* Headgates opened.
*b* Headgates closed.
*c* Gauge height interpolated.

MONTHLY DISCHARGE of Cumberland Ditch from Piapot Creek, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet |
|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | |
| May (9-31) | 6.7 | 0.99 | 2.5 | 114 |
| June (1-8) | 9.0 | 2.60 | 4.8 | 76 |
| The period | | | | 190 |

PIAPOT CREEK AT CUMBERLAND'S RANCH.

*Location.*—On the NE. ¼ Sec. 18, Tp. 11, Rge. 21, W. 3rd Mer.

*Records available.*—May 13, 1909, to October 31, 1915; from July 4, 1908, to May 12, 1909, records on this creek were obtained at a station three-quarters of a mile upstream from the present gauge.

*Gauge.*—Vertical staff. Zero maintained at elevation of 89.75 feet during 1909-11 and at 88.75 feet during 1912-15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Discharge measurements.*—Made with weir at low stages and with meter at ordinary stages.

*Winter flow.*—This station is not maintained during the winter.

*Artificial control.*—A log buried in the bed of the stream about forty feet below the gauge forms a control at this station.

*Diversions.*—Messrs. Fearon and Moorhead, D. Beveridge, Geo. Tranter and A. Cumberland divert water for irrigation purposes, above this station.

*Observer.*—A. Cumberland.

DISCHARGE MEASUREMENTS of Piapot Creek at Cumberland's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 23 | J. E. Caughey | 9.0 | 3.35 | 4.43 | 4.79 | 14.80 |
| Mar. 27 | do | 9.0 | 2.30 | 3.84 | 4.26 | 8.80 |
| April 2 | do | 14.0 | 16.25 | 0.57 | 2.00 | 9.30 |
| April 5 | do | 14.0 | 16.20 | 1.23 | 2.05 | 19.80 |
| April 10 | do | 13.0 | 10.15 | 0.96 | 1.57 | 9.80 |
| April 11 | do | 12.0 | 8.80 | 0.98 | 1.52 | 8.60 |
| April 12 | do | 12.0 | 8.80 | 0.90 | 1.57 | 8.00 |
| April 14 | do | 12.0 | 9.20 | 0.85 | 1.51 | 7.80 |
| May 1 | do | *a* | | | 1.03 | 0.18 |
| May 21 | do | | | | 1.08 | 0.57 |
| May 28 | do | *b* | | | 1.08 | 0.57 |
| June 24 | do | 9.3 | 4.80 | 0.97 | 1.36 | 4.70 |
| July 21 | do | 11.2 | 7.81 | 0.71 | 1.61 | 5.60 |
| Aug. 13 | do | 11.5 | 5.95 | 0.50 | 1.70 | 3.00 |
| Sept. 3 | G. H. Whyte and J. E. Caughey | 14.6 | 7.21 | 0.51 | 1.64 | 3.70 |
| Sept. 17 | J. E. Caughey | 11.0 | 5.20 | 0.43 | 1.34 | 2.30 |
| Oct. 4 | do | 12.0 | 6.80 | 0.76 | 1.45 | 5.20 |
| Oct. 21 | do | 12.0 | 6.35 | 0.50 | 1.32 | 3.20 |

*a-b* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Piapot Creek at Cumberland's Ranch, for 1915.

| DAY. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | | | 2.35 | 8.00*c* | 0.91 | 0.11 | 2.72 | 74.00 |
| 2 | | | 2.60 | 9.30 | 1.03 | 0.32 | 1.77 | 21.00 |
| 3 | | | 2.95 | 12.00*c* | 1.02 | 0.28 | 1.40 | 4.10 |
| 4 | | | 3.09 | 16.00*c* | 1.10 | 0.60 | 1.40 | 4.10 |
| 5 | | | 2.20 | 19.80 | 1.15 | 0.95 | 1.37 | 3.60 |
| 6 | | | 1.99 | 18.00*c* | 1.14 | 0.88 | 1.32 | 2.80 |
| 7 | | | 1.70 | 16.00*c* | 1.10 | 0.60 | 1.15 | 0.95 |
| 8 | | | 2.70 | 13.00*c* | 1.10 | 0.60 | 1.19 | 1.23 |
| 9 | | | 1.93 | 12.00*c* | 1.15 | 0.95 | 1.22 | 1.54 |
| 10 | | | 1.57 | 9.80 | 1.15 | 0.95 | 1.22 | 1.54 |
| 11 | | | 1.53*a* | 8.40 | 1.10 | 0.60 | 1.60 | 12.00 |
| 12 | | | 1.50 | 6.80 | 1.07 | 0.48 | 1.50 | 6.80 |
| 13 | | | 1.53 | 8.40 | 1.14 | 0.88 | 1.47 | 6.00 |
| 14 | | | 1.51 | 7.30 | 1.23 | 1.66 | 1.46 | 5.70 |
| 15 | 5.19 | 5.0*c* | 1.50 | 6.80 | 1.62 | 13.10 | 1.40 | 4.10 |
| 16 | 5.40 | 6.0*c* | 1.42 | 4.60 | 1.88 | 27.00 | 1.35 | 3.30 |
| 17 | 5.30 | 7.0*c* | 1.35 | 3.30 | 1.33 | 3.00 | 1.32 | 2.80 |
| 18 | 5.26 | 8.0*c* | 1.31 | 2.70 | 1.14 | 0.88 | 1.30 | 2.50 |
| 19 | 5.08 | 9.0*c* | 1.26 | 2.00 | 1.04 | 0.36 | 1.65 | 14.80 |
| 20 | 5.07 | 10.0*c* | 1.22 | 1.54 | 1.04 | 0.36 | 2.00 | 34.00 |
| 21 | 5.10 | 11.0*c* | 1.19 | 1.23 | 1.08 | 0.52 | 1.55 | 9.40 |
| 22 | 5.07 | 13.0*c* | 1.18 | 1.16 | 1.08 | 0.52 | 1.46 | 5.70 |
| 23 | 4.87 | 14.8 | 1.18 | 1.16 | 1.06 | 0.44 | 1.41 | 4.40 |
| 24 | 4.73 | 12.0*c* | 1.17 | 1.09 | 1.07 | 0.48 | 1.37 | 3.60 |
| 25 | 4.90*a* | 15.0 | 1.17 | 1.09 | 1.07 | 0.48 | 1.28 | 2.30 |
| 26 | 5.07 | 12.0*c* | 1.16 | 1.02 | 1.24 | 1.78 | 1.67 | 15.80 |
| 27 | 4.42 | 8.8 | 1.16 | 1.02 | 1.10 | 0.60 | 1.58*d* | 10.40 |
| 28 | 4.59 | 8.0*c* | 1.16 | 1.02 | 1.08 | 0.52 | 1.50 | 6.30 |
| 29 | 4.34 | 7.5*c* | 1.15 | 0.95 | 1.15*a* | 0.95 | 1.50 | 6.00 |
| 30 | 3.59 | 7.8*c* | 1.01 | 0.24 | 1.30*a* | 2.50 | 1.55 | 7.30 |
| 31 | 3.28 | 7.0*c* | | | 1.50*a* | 6.80 | | |

*a* Interpolated gauge heights.
*c* Discharge estimated. Ice conditions
*d-e* Shifting conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Piapot Creek at Cumberland's Ranch for 1915. —*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.60 | 9.40 | 1.70 | 5.70 | 1.50 | 1.90 | 1.29 | 2.40 |
| 2 | 1.30 | 2.40 | 1.65 | 4.10 | 1.54 | 2.40 | 1.30 | 2.50 |
| 3 | 1.35 | 2.30 | 1.60 | 3.10 | 1.63 | 3.80 | 1.45 | 4.40 |
| 4 | 1.30 | 1.54 | 1.58 | 2.70 | 1.60 | 3.50 | 1.47 | 6.00 |
| 5 | 1.30 | 1.54 | 1.57 | 2.10 | 1.57 | 3.30 | 1.39 | 3.90 |
| 6 | 1.29 | 1.42 | 1.57 | 1.78 | 1.45 | 1.90 | 1.47 | 6.00 |
| 7 | 1.49 | 4.10 | 1.55 | 1.23 | 1.50 | 2.80 | 1.44 | 5.20 |
| 8 | 1.40 | 2.70 | 1.65 | 1.16 | 1.51 | 2.30 | 1.36 | 3.50 |
| 9 | 1.54 | 5.20 | 1.57 | 1.23 | 1.45 | 2.70 | 1.37 | 3.60 |
| 10 | 2.13 | 36.00 | 1.57 | 1.16 | 1.40 | 2.30 | 1.44 | 5.20 |
| 11 | 1.57 | 5.72 | 1.59 | 1.23 | 1.35 | 1.90 | 1.45 | 4.40 |
| 12 | 1.47 | 3.50 | 1.60 | 1.30 | 1.40 | 2.80 | 1.46 | 5.70 |
| 13 | 1.63 | 7.80 | 1.74 | 3.10 | 1.45 | 3.90 | 1.46 | 5.70 |
| 14 | 1.95 | 25.00 | 1.70*a* | 2.50 | 1.47 | 4.40 | 1.40 | 4.10 |
| 15 | 1.86 | 19.70 | 1.67 | 2.10 | 1.40 | 3.50 | 1.38 | 3.80 |
| 16 | 1.73 | 12.60 | 1.64 | 1.78 | 1.35 | 2.40 | 1.37*a* | 3.60 |
| 17 | 1.70 | 11.00 | 1.67 | 2.30 | 1.35 | 2.40 | 1.37 | 3.50 |
| 18 | 1.99 | 26.00 | 1.65 | 2.10 | 1.32 | 2.10 | 1.35 | 3.30 |
| 19 | 1.78 | 14.80 | 1.62 | 1.90 | 1.35 | 2.80 | 1.33 | 3.00 |
| 20 | 1.70 | 10.40 | 1.65 | 2.40 | 1.34*e* | 2.80 | 1.32*a* | 2.85 |
| 21 | 1.60 | 5.60 | 1.70 | 3.30 | 1.33 | 3.00 | 1.32 | 2.80 |
| 22 | 1.86*a* | 18.00 | 1.65 | 2.70 | 1.32 | 2.80 | 1.31 | 2.70 |
| 23 | 2.13 | 33.00 | 1.63 | 2.50 | 1.32 | 2.80 | 1.31 | 2.70 |
| 24 | 2.02 | 26.00 | 1.63 | 2.70 | 1.31 | 2.70 | 1.31 | 2.70 |
| 25 | 1.85 | 16.40 | 1.60 | 2.30 | 1.30 | 2.50 | 1.30 | 2.50 |
| 26 | 1.80 | 13.10 | 1.53 | 1.54 | 1.30 | 2.50 | 1.31 | 2.70 |
| 27 | 1.75 | 9.90 | 1.54 | 1.66 | 1.30 | 2.50 | 1.32 | 2.80 |
| 28 | 1.70 | 6.80 | 1.53 | 1.66 | 1.29 | 2.40 | 1.31 | 2.70 |
| 29 | 1.82 | 12.60 | 1.52 | 1.66 | 1.29 | 2.40 | 1.32 | 2.80 |
| 30 | 1.72 | 6.80 | 1.52 | 1.90 | 1.29 | 2.40 | 1.34 | 3.10 |
| 31 | 1.72 | 6.50 | 1.50 | 1.78 | ..... | ..... | 1.35 | 3.30 |

*a* Interpolated gauge heights.
*d-e* Shifting conditions.

MONTHLY DISCHARGE of Piapot Creek at Cumberland's Ranch, for 1915.

(Drainage area 55 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per Square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (15-31) | 14.0 | 5.00 | 9.5 | 0.173 | 0.11 | 320 |
| April | 19.8 | 0.21 | 6.5 | 0.118 | 0.13 | 387 |
| May | 27.0 | 0.11 | 2.3 | 0.042 | 0.05 | 141 |
| June | 74.0 | 0.95 | 9.3 | 0.169 | 0.19 | 553 |
| July | 36.0 | 1.42 | 11.6 | 0.211 | 0.24 | 713 |
| August | 5.7 | 1.16 | 2.2 | 0.040 | 0.05 | 135 |
| September | 3.4 | 1.90 | 2.8 | 0.051 | 0.06 | 167 |
| October | 6.0 | 2.40 | 3.6 | 0.065 | 0.08 | 221 |
| The period | | | | | 0.89 | 2,637 |

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Crane Lake drainage basin, in 1915.

| Date. | Engineer. | Stream. | Location. | Discharge |
|---|---|---|---|---|
| May 3 | J. E. Caughey | S. McCarthy Ditch | SE. 25-10-24-3 | Nil. |
| May 3 | do | Glennie Creek | do | 0.369c |
| June 25 | do | do | do | 0.372c |
| July 22 | do | do | do | 0.079c |

c Weir measurement.

## HAY LAKE DRAINAGE BASIN.

*General Description.*

Hay Lake is in Township 11, Range 25, West of the 3rd Meridian, and is fed by Hay Creek which rises in the Cypress Hills. It is a comparatively small body of saline water of an approximate area of three square miles. Like all lakes in this locality it has no outlet.

The basin supplies water for a number of irrigation schemes, and also to the town of Maple Creek for domestic and industrial purposes, the water being piped some nine miles by means of a gravity system.

The annual precipitation averages about twelve inches; during 1913 and 1914 it was slightly less than this amount.

### HAMMOND WEST DITCH FROM EAST BRANCH OF HAY CREEK.

*Location.*—On the SW. ¼ Sec. 16, Tp. 10, Rge. 25, W. 3rd Mer., twelve miles southeast of the town of Maple Creek and 12 feet from the dam.

*Records available.*—For irrigation season of 1915.

*Gauge.*—Vertical staff three feet long. Zero elevation maintained at 93.965 feet during 1915.

*Bench-mark.*—A three-quarter inch iron rod on a gravel knoll 250 feet east of the weir in the west ditch and midway between the east and west ditches; protected by rocks. Assumed elevation, 100.00 feet.

*Channel.*—One channel, heavy black loam, highly gravelled.

*Discharge measurements.*—Made directly from the ditch weir.

*Observer.*—G. R. Hammond.

*Note.*—Water for irrigation purposes was not used in 1915.

DISCHARGE MEASUREMENTS of Hammond West Ditch from East Branch of Hay Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 3 | J. E. Caughey | | | | | Dry. |
| May 26 | do | | | | 0.41 | 0.125a |
| June 22 | do | | | | 0.41 | 0.005a |

a Weir measurement.

### HAMMOND EAST DITCH FROM EAST BRANCH OF HAY CREEK.

*Location.*—On the SW. ¼ Sec. 16, Tp. 10, Rge. 25, W. 3rd Mer., about twelve miles southeast of Maple Creek P. O. and 200 feet from intake of ditch.

*Records available.*—For irrigation season of 1915.

*Gauge.*—Vertical staff three feet long. Zero elevation maintained at 97.81 feet during 1915.

*Bench-mark.*—A three-quarter inch iron rod on a gravel knoll midway between the east and west ditches and 250 feet west of the station. Well protected by rocks. Assumed elevation, 100.00 feet.

*Channel.*—One channel with a gravelly clay bed.

*Discharge measurements.*—Made with current-meter or weir.

*Established.*—May 26, 1915, by M. H. French.

*Observer.*—G. R. Hammond.

DISCHARGE MEASUREMENTS of Hammond East Ditch from East Branch of Hay Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 26 | J. E. Caughey | ..... | ..... | ..... | 0.59 | 0.07*a* |
| June 22 | do | ..... | ..... | ..... | ..... | Dry. |

*a* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Hammond East Ditch from East Branch of Hay Creek, for 1915.

| Day. | May. | | June. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 0.60 | 0.07 |
| 2 | ..... | ..... | 0.60 | 0.07 |
| 3 | ..... | ..... | 0.60 | 0.07 |
| 4 | ..... | ..... | 0.60 | 0.07 |
| 5 | ..... | ..... | 0.60 | 0.07 |
| 6 | ..... | ..... | 0.60 | 0.07 |
| 7 | ..... | ..... | ..... | ..... |
| 8 | ..... | ..... | ..... | ..... |
| 9 | ..... | ..... | ..... | ..... |
| 10 | ..... | ..... | ..... | ..... |
| 11 | ..... | ..... | ..... | ..... |
| 12 | ..... | ..... | ..... | ..... |
| 13 | ..... | ..... | ..... | ..... |
| 14 | ..... | ..... | ..... | ..... |
| 15 | ..... | ..... | ..... | ..... |
| 16 | ..... | ..... | ..... | ..... |
| 17 | ..... | ..... | ..... | ..... |
| 18 | ..... | ..... | ..... | ..... |
| 19 | ..... | ..... | ..... | ..... |
| 20 | ..... | ..... | ..... | ..... |
| 21 | ..... | ..... | ..... | ..... |
| 22 | ..... | ..... | ..... | ..... |
| 23 | ..... | ..... | ..... | ..... |
| 24 | ..... | ..... | ..... | ..... |
| 25 | ..... | ..... | ..... | ..... |
| 26 | 0.59 | 0.07 | ..... | ..... |
| 27 | 0.70 | 0.10 | ..... | ..... |
| 28 | 0.70 | 0.10 | ..... | ..... |
| 29 | 0.70 | 0.10 | ..... | ..... |
| 30 | 0.70 | 0.10 | ..... | ..... |
| 31 | 0.70 | 0.10 | ..... | ..... |

MONTHLY DISCHARGE of Hammond East Ditch from East Branch of Hay Creek, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | |
| May | 0.10 | 0.07 | 0.10 | 1.18 |
| June | 0.07 | 0.07 | 0.07 | 0.83 |
| The period | | | | 2.01 |

HAY CREEK AT HAY CREEK SCHOOL.

*Location.*—On the SW. ¼ Sec. 29, Tp. 10, Rge. 25, W. 3rd Mer.

*Records available.*—March 24, 1911, to October 31, 1915.

*Gauge.*—Vertical staff. Zero elevation has been maintained at 94.79 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Slightly shifting.

*Discharge measurements.*—Made with weir at ordinary stages and with a meter in high water periods.

*Winter flow.*—This station is not maintained during the winter.

*Diversions.*—The town of Maple Creek takes its water from springs at the head of this creek.

*Observer.*—Miss M. E. Fauquier.

DISCHARGE MEASUREMENTS of Hay Creek at Hay Creek School, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 29 | J. E. Caughey | ..... | ..... | ..... | 1.20 | 0.44*a* |
| April 6 | do | 5.0 | 5.40 | 1.36 | 1.70 | 7.38 |
| May 4 | do | ..... | ..... | ..... | 1.15 | 0.11*a* |
| May 26 | do | ..... | ..... | ..... | 1.17 | 0.28*a* |
| June 22 | do | ..... | ..... | ..... | 1.25 | 0.59*a* |
| July 20 | do | 6.0 | 1.85 | 0.64 | 1.31 | 1.19 |
| Aug. 11 | do | ..... | ..... | ..... | 1.16 | 0.02*a* |
| Sept. 1 | G. H. Whyte and J. E. Caughey | ..... | ..... | ..... | 1.19 | 0.06*a* |
| Sept. 16 | J. E. Caughey | ..... | ..... | ..... | 1.20 | 0.14*a* |
| Oct. 2 | do | ..... | ..... | ..... | 1.18 | 0.14*a* |
| Oct. 20 | do | ..... | ..... | ..... | 1.15 | 0.12*a* |
| Nov. 5 | do | ..... | ..... | ..... | 1.16 | 0.08*a* |

*a* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Hay Creek at Hay Creek School, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.18 | 0.29 | 1.12 | 0.09 | 1.17 | 0.26 |
| 2 | ..... | ..... | 1.82 | 10.30 | 1.12 | 0.09 | 1.15 | 0.19 |
| 3 | ..... | ..... | 2.20 | 19.40 | 1.16 | 0.09 | 1.25 | 0.68 |
| 4 | ..... | ..... | 1.91 | 12.40 | 1.17 | 0.22 | 1.50 | 3.40 |
| 5 | ..... | ..... | 1.84 | 10.80 | 1.20 | 0.26 | 1.50 | 3.40 |
| 6 | ..... | ..... | 1.70 | 7.40 | 1.20 | 0.36 | 1.35 | 1.50 |
| 7 | ..... | ..... | 1.58 | 4.80 | 1.20 | 0.36 | 1.25 | 0.68 |
| 8 | ..... | ..... | 1.54 | 4.10 | 1.19 | 0.33 | 1.15 | 0.19 |
| 9 | ..... | ..... | 1.50 | 3.40 | 1.20 | 0.36 | 1.15 | 0.19 |
| 10 | ..... | ..... | 1.42 | 2.30 | 1.14 | 0.16 | 1.15 | 0.19 |
| 11 | ..... | ..... | 1.36 | 1.60 | 1.14 | 0.16 | 1.16 | 0.22 |
| 12 | ..... | ..... | 1.32 | 1.20 | 1.14 | 0.16 | 1.15 | 0.19 |
| 13 | ..... | ..... | 1.40 | 2.00 | 1.15 | 0.19 | 1.15 | 0.19 |
| 14 | ..... | ..... | 1.34 | 1.40 | 1.20 | 0.36 | 1.13 | 0.12 |
| 15 | ..... | ..... | 1.28 | 0.87 | 1.35 | 1.50 | 1.13 | 0.12 |
| 16 | ..... | ..... | 1.28 | 0.87 | 1.65 | 6.30 | 1.13 | 0.12 |
| 17 | ..... | ..... | 1.27 | 0.81 | 1.68 | 7.00 | 1.13 | 0.12 |
| 18 | ..... | ..... | 1.26 | 0.74 | 1.45 | 2.70 | 1.13 | 0.12 |
| 19 | ..... | ..... | 1.22 | 0.49 | 1.45 | 2.70 | 1.15 | 0.19 |
| 20 | ..... | ..... | 1.24 | 0.62 | 1.45 | 2.70 | 1.20 | 0.36 |
| 21 | 1.89*a* | 2.00 | 1.17 | 0.26 | 1.45 | 2.70 | 1.25 | 0.68 |
| 22 | 1.81*a* | 2.00 | 1.15 | 0.19 | 1.40 | 2.00 | 1.25 | 0.68 |
| 23 | 1.55*a* | 2.00 | 1.16 | 0.22 | 1.40 | 2.00 | 1.15 | 0.19 |
| 24 | 1.43 | 2.40 | 1.15 | 0.19 | 1.15 | 0.19 | 1.15 | 0.19 |
| 25 | 1.85 | 11.00 | 1.15 | 0.19 | 1.15 | 0.19 | 1.15 | 0.19 |
| 26 | 1.85 | 11.00 | 1.15 | 0.19 | 1.17 | 0.26 | 1.15 | 0.19 |
| 27 | 1.65 | 6.30 | 1.15 | 0.19 | 1.15 | 0.19 | 1.15 | 0.19 |
| 28 | 1.45 | 2.70 | 1.20 | 0.36 | 1.15 | 0.19 | 1.17 | 0.26 |
| 29 | 1.20 | 0.36 | 1.16 | 0.22 | 1.17 | 0.26 | 1.15 | 0.19 |
| 30 | 1.22 | 0.49 | 1.18 | 0.29 | 1.15 | 0.19 | 1.15 | 0.19 |
| 31 | 1.19 | 0.33 | ..... | ..... | 1.15 | 0.19 | ..... | ..... |

*a* Ice conditions, estimated flow.

DAILY GAUGE HEIGHT AND DISCHARGE of Hay Creek at Hay Creek School, for 1915.—*Concluded.*

| DAY. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.15 | 0.19 | 1.25 | 0.36 | 1.19 | 0.11 | 1.16 | 0.08 |
| 2 | 1.15 | 0.19 | 1.24 | 0.31 | 1.26 | 0.41 | 1.16 | 0.08 |
| 3 | 1.16 | 0.22 | 1.21 | 0.17 | 1.25 | 0.36 | 1.18 | 0.10 |
| 4 | 1.20 | 0.36 | 1.19 | 0.11 | 1.20 | 0.12 | 1.18 | 0.10 |
| 5 | 1.19 | 0.33 | 1.18 | 0.10 | 1.20 | 0.12 | 1.18 | 0.10 |
| 6 | 1.21 | 0.42 | 1.16 | 0.08 | 1.24 | 0.31 | 1.18 | 0.10 |
| 7 | 1.22 | 0.49 | 1.15 | 0.06 | 1.20 | 0.12 | 1.18 | 0.10 |
| 8 | 1.50 | 3.40 | 1.14 | 0.05 | 1.20 | 0.12 | 1.18 | 0.10 |
| 9 | 1.70 | 7.40 | 1.14 | 0.05 | 1.20 | 0.12 | 1.18 | 0.10 |
| 10 | 1.35 | 1.50 | 1.14 | 0.05 | 1.25 | 0.36 | 1.18 | 0.10 |
| 11 | 1.21 | 0.42 | 1.14 | 0.05 | 1.25 | 0.36 | 1.18 | 0.10 |
| 12 | 1.21 | 0.42 | 1.14 | 0.05 | 1.25 | 0.36 | 1.18 | 0.10 |
| 13 | 1.32 | 1.20 | 1.16 | 0.08 | 1.25 | 0.36 | 1.18 | 0.10 |
| 14 | 1.45 | 2.70 | 1.16 | 0.08 | 1.25 | 0.36 | 1.18 | 0.10 |
| 15 | 1.33 | 1.30 | 1.08 | 0.01 | 1.25 | 0.36 | 1.18 | 0.10 |
| 16 | 1.24 | 0.62 | 1.12 | 0.03 | 1.21 | 0.17 | 1.18 | 0.10 |
| 17 | 1.35 | 1.50 | 1.25 | 0.36 | 1.20 | 0.12 | 1.18 | 0.10 |
| 18 | 1.42 | 2.30 | 1.30 | 0.60 | 1.20 | 0.12 | 1.18 | 0.10 |
| 19 | 1.32 | 1.20 | 1.28 | 0.50 | 1.20 | 0.12 | 1.18 | 0.10 |
| 20 | 1.31 | 1.10 | 1.28 | 0.50 | 1.19 | 0.11 | 1.18 | 0.10 |
| 21 | 1.23 | 0.55 | 1.15 | 0.06 | 1.19 | 0.11 | 1.18 | 0.10 |
| 22 | 1.28 | 0.87 | 1.16 | 0.08 | 1.18 | 0.10 | 1.18 | 0.10 |
| 23 | 1.48 | 2.40 | 1.18 | 0.10 | 1.17 | 0.09 | 1.18 | 0.10 |
| 24 | 1.37 | 1.16 | 1.18 | 0.10 | 1.16 | 0.08 | 1.18 | 0.10 |
| 25 | 1.32 | 0.76 | 1.18 | 0.10 | 1.16 | 0.08 | 1.18 | 0.10 |
| 26 | 1.31 | 0.68 | 1.18 | 0.10 | 1.16 | 0.08 | 1.18 | 0.10 |
| 27 | 1.29 | 0.55 | 1.18 | 0.10 | 1.16 | 0.08 | 1.18 | 0.10 |
| 28 | 1.30 | 0.60 | 1.18 | 0.10 | 1.16 | 0.08 | 1.18 | 0.10 |
| 29 | 1.32 | 0.76 | 1.18 | 0.10 | 1.16 | 0.08 | 1.18 | 0.10 |
| 30 | 1.29 | 0.55 | 1.18 | 0.10 | 1.16 | 0.08 | 1.18 | 0.10 |
| 31 | 1.27 | 0.46 | 1.18 | 0.10 | ..... | ..... | 1.18 | 0.10 |

MONTHLY DISCHARGE of Hay Creek at Hay Creek School, for 1915.

(Drainage area 22 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet |
| March (21-31) | 11.00 | 0.33 | 3.70 | 0.17 | 0.07 | 81 |
| April | 19.40 | 0.19 | 2.90 | 0.13 | 0.14 | 173 |
| May | 7.00 | 0.09 | 1.11 | 0.05 | 0.06 | 68 |
| June | 3.40 | 0.12 | 0.51 | 0.02 | 0.03 | 30 |
| July | 2.70 | 0.19 | 1.18 | 0.05 | 0.06 | 73 |
| August | 0.60 | 0.01 | 0.15 | 0.01 | 0.01 | 9 |
| September | 0.41 | 0.08 | 0.18 | 0.01 | 0.01 | 11 |
| October | 0.10 | 0.08 | 0.10 | 0.01 | 0.01 | 6 |
| The period | ... | ... | ... | ... | 0.39 | 451 |

FAUQUIER DITCH FROM HAY CREEK.

*Location.*—On the NE. ¼ Sec. 30, Tp. 10, Rge. 25, W. 3rd Mer., about twenty feet downstream from the headgate.

*Records available.*—For irrigation season of 1915.

*Gauge.*—Vertical staff. Zero elevation maintained at 94.80 feet since March 29, 1915.

*Bench-mark.*—Permanent iron bench-mark, located 300 feet east of the gauge and across Hay Creek. Assumed elevation, 100.00 feet.

*Channel.*—One channel at all stages.

*Discharge measurements.*—Made with a weir.

*Observer.*—Miss M. Fauquier.

DISCHARGE MEASUREMENTS of Fauquier Ditch from Hay Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 29 | J. E. Caughey | ..... | ..... | ..... | ..... | Nil. |
| May 26 | do | ..... | ..... | ..... | 1.24 | 0.26*a* |
| June 22 | do | ..... | ..... | ..... | 0.99 | Nil.*b* |

*a* Weir measurement.
*b* Water standing in pools.

DAILY GAUGE HEIGHT AND DISCHARGE of Fauquier Ditch from Hay Creek, for 1915.

| Day. | April. | | May. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.14 | 0.18 |
| 2 | ..... | ..... | 1.14 | 0.18 |
| 3 | ..... | ..... | 1.14 | 0.18 |
| 4 | ..... | ..... | 1.15 | 0.19 |
| 5 | ..... | ..... | 1.15 | 0.19 |
| 6 | ..... | ..... | 1.15 | 0.19 |
| 7 | ..... | ..... | 1.15 | 0.19 |
| 8 | ..... | ..... | 1.15 | 0.19 |
| 9 | ..... | ..... | 1.15 | 0.19 |
| 10 | ..... | ..... | 1.10 | 0.15 |
| 11 | ..... | ..... | 1.10 | 0.15 |
| 12 | ..... | ..... | 1.10 | 0.15 |
| 13 | 1.35 | 0.38 | 1.15 | 0.19 |
| 14 | 1.40 | 0.43 | 1.20 | 0.22 |
| 15 | 1.24 | 0.26 | 1.45 | 0.49 |
| 16 | 1.27 | 0.29 | ..... | ..... |
| 17 | 1.23 | 0.25 | ..... | ..... |
| 18 | 1.25 | 0.27 | ..... | ..... |
| 19 | 1.24 | 0.26 | ..... | ..... |
| 20 | 1.23 | 0.25 | ..... | ..... |
| 21 | 1.17 | 0.20 | ..... | ..... |
| 22 | 1.16 | 0.19 | ..... | ..... |
| 23 | 1.15 | 0.19 | ..... | ..... |
| 24 | 1.16 | 0.19 | ..... | ..... |
| 25 | 1.16 | 0.19 | ..... | ..... |
| 26 | 1.16 | 0.19 | ..... | ..... |
| 27 | 1.16 | 0.19 | ..... | ..... |
| 28 | 1.21 | 0.23 | ..... | ..... |
| 29 | 1.17 | 0.20 | ..... | ..... |
| 30 | 1.19 | 0.21 | ..... | ..... |
| 31 | ..... | ..... | ..... | ..... |

MONTHLY DISCHARGE of Fauquier Ditch from Hay Creek, for 1915.

| MONTH. | DISCHARGE IN SECOND-FEET. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| April (13–30) | 0.43 | 0.19 | 0.24 | 8.57 |
| May (1–15) | 0.49 | 0.15 | 0.20 | 5.95 |
| The period | ..... | ..... | ..... | 14.52 |

PEACOCK WEST DITCH NEAR MAPLE CREEK.

*Location.*—On the SW. ¼ Sec. 36, Tp. 10, Rge. 26, W. 3rd Mer., about five miles southeast of Maple Creek, Saskatchewan.

*Gauge.*—Vertical staff, situated on right side of ditch about 55 feet below the headgate. Zero elevation maintained at 98.50 feet since establishment.

*Bench-mark.*—On a wooden plug, used as I. P. for soundings, situated on the right side of ditch about four feet below the gauge. Assumed elevation, 100.00 feet.

*Channel.*—One channel, clay loam bed.

*Discharge measurements.*—Made with meter or weir.

*Observer.*—F. W. Peacock.

*Remarks.*—This station was established on May 19, 1915, by M. H. French. No records were obtained in 1915.

PEACOCK EAST DITCH NEAR MAPLE CREEK.

*Location.*—On the SW. ¼ Sec. 36, Tp. 10, Rge. 26, W. 3rd Mer., five miles southeast of Maple Creek, Saskatchewan.

*Gauge.*—Vertical staff, situated on the right bank of the ditch about 100 feet below the intake. Zero elevation maintained at 98.63 feet since establishment.

*Bench-mark.*—On a wooden plug on the right side of ditch about five feet below the gauge; used also as I. P. for soundings. Assumed elevation, 100.00 feet.

*Channel.*—One channel, clay loam bed.

*Discharge measurements.*—Made by meter or weir.

*Observer.*—F. W. Peacock.

*Remarks.*—This station was established on May 19, 1915, by M. H. French. No records were obtained in 1915.

HAY CREEK AT FAUQUIER'S RANCH.

*Location.*—On the NE. ¼ Sec. 30, Tp. 10, Rge. 25, W. 3rd Mer.

*Records available.*—April 25, 1909, to October 31, 1914. One discharge measurement in 1915.

*Remarks.*—Station not maintained during 1915.

DISCHARGE MEASUREMENTS of Hay Creek at Fauquier's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 17 | J. E. Caughey | 2.0 | 0.30 | 0.51 | 0.62 | 0.15 |

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Hay Lake drainage basin, in 1915.

| Date. | Engineer. | Stream. | Location. | Discharge. | |
|---|---|---|---|---|---|
| | | | | *Imperial Gallons per 24 hours.* | *Sec.-ft.* |
| Jan. 15 | J. E. Caughey | Ram Spring | SE. 20-10-25-3 | 8,989*a* | 0.0167 |
| Feb. 15 | F. R. Steinberger | do | do | ..... | .....*b* |
| Mar. 17 | J. E. Caughey | do | do | 13,672*a* | 0.0254 |
| April 6 | do | do | do | 39,830*a* | 0.0740 |
| May 26 | do | do | do | 33,481*a* | 0.0622 |
| June 22 | do | do | do | 24,437*a* | 0.0454 |
| July 20 | do | do | do | 36,603*a* | 0.0680 |
| Aug. 11 | do | do | do | 18,785*a* | 0.0349 |
| Sept. 1 | G. H. Whyte and J. E. Caughey | do | do | 18,785*a* | 0.0349 |
| Sept. 16 | J. E. Caughey | do | do | 30,358*a* | 0.0564 |
| Oct. 2 | do | do | do | 21,584*a* | 0.0401 |
| Oct. 20 | do | do | do | 11,250*a* | 0.0209 |
| Nov. 2 | do | do | do | 18,786*a* | 0.0345 |
| Jan. 15 | do | Upper Spring | SE. 10-10-25-3 | 83,002*a* | 0.1498 |
| Feb. 15 | F. R. Steinberger | do | do | 64,482*a* | 0.1198 |
| May 26 | J. E. Caughey | do | do | 104,422*a* | 0.1940 |
| June 22 | do | do | do | 104,307*a* | 0.1938 |
| July 20 | do | do | do | 120,519*a* | 0.2180 |
| Aug. 11 | do | do | do | 76,112*a* | 0.1414 |
| Sept. 1 | G. H. Whyte and J. E. Caughey | do | do | 97,104*a* | 0.1804 |
| Sept. 16 | J. E. Caughey | do | do | 104,317*a* | 0.1938 |
| Oct. 2 | do | do | do | 104,349*a* | 0.1939 |
| Oct. 20 | do | do | do | 97,104*a* | 0.1804 |
| Jan. 15 | do | Saunders Spring | SE. 20-10-25-3 | 336,420*a* | 0.6250 |
| Feb. 15 | F. R. Steinberger | do | do | 311,121*e* | 0.5780 |
| Mar. 17 | J. E. Caughey | do | do | 303,552*f* | 0.5640 |
| April 6 | do | do | do | 483,840*a* | 0.8990 |
| May 26 | do | do | do | 489,182*a* | 0.9088 |
| June 22 | do | do | do | 483,906*a* | 0.8990 |
| July 20 | do | do | do | 486,059*a* | 0.9030 |
| Aug. 11 | do | do | do | 503,876*a* | 0.9361 |
| Sept. 1 | G. H. Whyte and J. E. Caughey | do | do | 426,904*a* | 0.7931 |
| Sept. 16 | J. E. Caughey | do | do | 415,330*a* | 0.7716 |
| Oct. 2 | do | do | do | 445,689*a* | 0.8280 |
| Oct. 20 | do | do | do | 445,689*a* | 0.8280 |
| Nov. 2 | J. E. Caughey and M. H. French | do | do | 428,464*a* | 0.7960 |

*a* Weir measurement.
*b* Flow very small.
*e–f* Capacity measurements

## BIGSTICK LAKE DRAINAGE BASIN.

### *General Description.*

Bigstick is one of the largest lakes in the Northern Cypress Hills district. It is situated about Township 15, Range 25, West of the 3rd Meridian, and covers an area of thirty-five square miles. The lake is alkaline in character and has no outlet.

The only source of supply of the lake is Maple Creek which with its tributary, Gap Creek, rises in the Cypress Hills thirty miles south. On the south and east, the lake is bounded by the sand hills. The drainage area is 820 square miles.

The topography of the drainage basin is for the most part gently rolling, and the creek slope is small except near the source. The basin is bare of trees except in the hills. The channel is flat, wide and in most places sandy.

There are several small irrigation ditches in the basin.

#### ADAMS NORTH DITCH FROM CYPRESS CREEK.

*Location.*—On the NE. ¼ Sec. 10, Tp. 9, Rge. 27, W. 3rd Mer., at Geo. A. Adams' ranch.

*Records available.*—For irrigation seasons of 1914–15.

*Gauge.*—Vertical staff, located near the left bank and fifty feet below the headgate. Elevation of zero 97.14 feet.

*Bench-mark.*—Top of wooden stake about eight feet from gauge on the left bank. Assumed elevation, 100.00 feet.

*Control.*—A permanent twenty-four-inch sharp crested weir, with complete end contractions, acts as a control. The crest of the weir is maintained at an elevation of 99.09 feet.

*Channel.*—Composed of a black sandy loam.

*Discharge measurements.*—Computed from the measured head over the 24-inch weir.

*Observer.*—Geo. A. Adams.

DISCHARGE MEASUREMENTS of Adams North Ditch from Cypress Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 29 | H. W. Rowley | ..... | ..... | ..... | 2.01 | 0.10 |
| July 12 | do | ..... | ..... | ..... | Dry. | Nil. |
| Aug. 26 | do | ..... | ..... | ..... | " | " |

DAILY GAUGE HEIGHT AND DISCHARGE of Adams North Ditch from Cypress Creek, for 1915.

| Day. | May. | | June. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.20 | 0.81 |
| 2 | ..... | ..... | 2.15 | 0.53 |
| 3 | ..... | ..... | 2.27 | 1.12 |
| 4 | ..... | ..... | 2.24 | 1.10 |
| 5 | ..... | ..... | 2.21 | 0.81 |
| 6 | ..... | ..... | 2.09 | 0.34 |
| 7 | ..... | ..... | 2.07 | 0.27 |
| 8 | ..... | ..... | 2.06 | 0.24 |
| 9 | ..... | ..... | 2.05 | 0.20 |
| 10 | ..... | ..... | 2.06 | 0.24 |
| 11 | ..... | ..... | 2.06 | 0.24 |
| 12 | ..... | ..... | 2.04 | 0.18 |
| 13 | ..... | ..... | 2.04*b* | 0.18 |
| 14 | ..... | ..... | 2.04 | 0.18 |
| 15 | ..... | ..... | 2.04 | 0.18 |
| 16 | ..... | ..... | 2.04 | 0.18 |
| 17 | ..... | ..... | 2.05 | 0.20 |
| 18 | ..... | ..... | 2.04 | 0.18 |
| 19 | ..... | ..... | 2.08 | 0.31 |
| 20 | ..... | ..... | 2.07*b* | 0.27 |
| 21 | ..... | ..... | 2.06 | 0.24 |
| 22 | ..... | ..... | 2.05 | 0.20 |
| 23 | ..... | ..... | 2.04*b* | 0.18 |
| 24 | ..... | ..... | 2.03 | 0.15 |
| 25 | ..... | ..... | 2.04*b* | 0.18 |
| 26 | ..... | ..... | 2.07*c* | 0.27 |
| 27 | ..... | ..... | ..... | ..... |
| 28 | 2.02*a* | 0.12 | ..... | ..... |
| 29 | 2.01 | 0.10 | ..... | ..... |
| 30 | 2.00 | 0.07 | ..... | ..... |
| 31 | 2.01 | 0.10 | ..... | ..... |

*a* Headgate opened.
*b* Gauge height interpolated.
*c* Headgate closed.

MONTHLY DISCHARGE of Adams North Ditch from Cypress Creek, for 1915.

| Month. | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | |
| May (28–31) | 0.12 | 0.07 | 0.10 | Nil. |
| June (1–26) | 1.12 | 0.15 | 0.35 | 18 |
| The period | | | | 18 |

ADAMS SOUTH DITCH FROM CYPRESS CREEK.

*Location.*—On the NE. ¼ Sec. 10, Tp. 9, Rge. 27, W. 3rd Mer., at Geo. A. Adams' ranch.

*Records available.*—For the irrigation seasons of 1914-15.

*Gauge.*—Vertical staff, located near the left bank, about 100 feet below the headgate. Elevation of zero, 91.54 feet.

*Bench-mark.*—Permanent iron bench-mark located in the quarter-section line 200 feet south of the gauge rod and weir. Assumed elevation, 100.00 feet.

*Control.*—A permanent twenty-four-inch sharp crested weir, with complete end contractions, is used as a control. The elevation of the crest is maintained at 93.22 feet.

*Channel.*—Composed of sandy loam.

*Discharge measurements.*—Computed from the measured head over the weir.

*Observer.*—Geo. A. Adams.

DISCHARGE MEASUREMENTS of Adams South Ditch from Cypress Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 29 | H. W. Rowley | ..... | ..... | ..... | Dry. | Nil. |
| July 12 | do | ..... | ..... | ..... | " | " |
| Aug. 26 | do | ..... | ..... | ..... | " | " |

DAILY GAUGE HEIGHT AND DISCHARGE of Adams South Ditch from Cypress Creek, for 1915.

| Day. | April. | | May. | | June. | | July–August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.11*a* | 1.81 | 1.76*b* | 0.15 | 2.06 | 1.50 | *c* | ..... | ..... | ..... | 1.78 | 0.20 |
| 2 | 2.11 | 1.81 | 1.76 | 0.15 | 2.06 | 1.50 | ..... | ..... | ..... | ..... | 1.79 | 0.24 |
| 3 | 2.16 | 2.10 | 1.79 | 0.24 | 2.09 | 1.69 | ..... | ..... | ..... | ..... | 1.96 | 0.96 |
| 4 | 2.14 | 1.99 | 1.78 | 0.20 | 2.07 | 1.56 | ..... | ..... | ..... | ..... | 1.83 | 0.38 |
| 5 | 2.07 | 1.56 | 1.77 | 0.18 | 2.06 | 1.50 | ..... | ..... | ..... | ..... | 1.79 | 0.24 |
| 6 | 2.04 | 1.38 | 1.77 | 0.18 | 1.88 | 0.58 | ..... | ..... | 1.76 | 0.15 | 1.83 | 0.38 |
| 7 | 1.90 | 0.67 | 1.78 | 0.20 | 1.90 | 0.67 | ..... | ..... | 1.78 | 0.20 | 1.78 | 0.20 |
| 8 | 1.97 | 1.00 | 1.77 | 0.18 | 1.81 | 0.31 | ..... | ..... | 1.79 | 0.24 | 1.79 | 0.24 |
| 9 | 1.93 | 0.81 | 1.79 | 0.24 | 1.79 | 0.24 | ..... | ..... | 1.80 | 0.27 | 1.78 | 0.20 |
| 10 | 1.87 | 0.31 | 1.76 | 0.15 | 1.81 | 0.31 | ..... | ..... | 1.78 | 0.20 | ..... | ..... |
| 11 | 1.81 | 0.31 | 1.76 | 0.15 | 1.79 | 0.24 | ..... | ..... | 1.78 | 0.20 | ..... | ..... |
| 12 | 1.86 | 0.50 | 1.76 | 0.15 | 1.76 | 0.15 | ..... | ..... | 1.79 | 0.24 | ..... | ..... |
| 13 | 1.87 | 0.53 | 1.76 | 0.15 | 1.76*b* | 0.15 | ..... | ..... | 1.80 | 0.27 | ..... | ..... |
| 14 | 1.95 | 0.91 | 1.85 | 0.46 | 1.76 | 0.15 | ..... | ..... | 1.79 | 0.24 | ..... | ..... |
| 15 | 1.78 | 0.20 | 2.02 | 1.28 | 1.76 | 0.15 | ..... | ..... | 1.79 | 0.24 | ..... | ..... |
| 16 | 1.88 | 0.58 | 1.96 | 0.96 | 1.76 | 0.15 | ..... | ..... | 1.79 | 0.24 | ..... | ..... |
| 17 | 1.88 | 0.58 | 1.86 | 0.50 | 1.77 | 0.18 | ..... | ..... | 1.77 | 0.18 | ..... | ..... |
| 18 | 1.94 | 0.86 | 1.81 | 0.31 | 1.84 | 0.42 | ..... | ..... | 1.88 | 0.58 | ..... | ..... |
| 19 | 1.80 | 0.27 | 1.81 | 0.31 | 1.81 | 0.31 | ..... | ..... | 1.79 | 0.24 | ..... | ..... |
| 20 | 1.83 | 0.38 | 1.81 | 0.31 | 1.80 | 0.27 | ..... | ..... | 1.77 | 0.18 | ..... | ..... |
| 21 | 1.80 | 0.27 | 1.81 | 0.31 | 1.79 | 0.24 | ..... | ..... | 1.76 | 0.15 | ..... | ..... |
| 22 | 1.76 | 0.15 | 1.80 | 0.27 | 1.75 | 0.12 | ..... | ..... | 1.74 | 0.10 | ..... | ..... |
| 23 | 1.82 | 0.34 | 1.78 | 0.20 | 1.74 | 0.10 | ..... | ..... | 1.74 | 0.10 | ..... | ..... |
| 24 | 1.83 | 0.38 | 1.77 | 0.18 | 1.74*b* | 0.10 | ..... | ..... | 1.78 | 0.20 | ..... | ..... |
| 25 | 1.80 | 0.27 | 1.78 | 0.20 | 1.73 | 0.07 | ..... | ..... | 1.78*b* | 0.20 | ..... | ..... |
| 26 | 1.79 | 0.24 | 1.78 | 0.20 | ..... | ..... | ..... | ..... | 1.78 | 0.20 | ..... | ..... |
| 27 | 1.77 | 0.18 | 1.76 | 0.15 | ..... | ..... | ..... | ..... | 1.79 | 0.24 | ..... | ..... |
| 28 | 1.80 | 0.27 | 1.76 | 0.15 | ..... | ..... | ..... | ..... | 1.78 | 0.20 | ..... | ..... |
| 29 | 1.81 | 0.31 | 1.77 | 0.18 | ..... | ..... | ..... | ..... | 1.76 | 0.15 | ..... | ..... |
| 30 | 1.80 | 0.27 | 1.77 | 0.18 | ..... | ..... | ..... | ..... | 1.76 | 0.15 | ..... | ..... |
| 31 | ..... | ..... | 1.76 | 0.15 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

*a* Headgate opened.
*b* Gauge height interpolated.
*c* No water used during July and August

MONTHLY DISCHARGE of Adams South Ditch from Cypress Creek, for 1915.

| MONTH. | DISCHARGE IN SECOND-FEET. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| April | 2.10 | 0.15 | 0.70 | 42.0 |
| May | 1.28 | 0.15 | 0.28 | 17.0 |
| June | 1.69 | 0.07 | 0.51 | 25.0 |
| July | ..... | ..... | ..... | Nil. |
| August | ..... | ..... | ..... | |
| September | 0.58 | 0.10 | 0.22 | 11.0 |
| October | 0.96 | 0.20 | 0.33 | 6.0 |
| The period | ..... | ..... | ..... | 101.0 |

GEORGE POLLOCK'S EAST DITCH FROM CYPRESS CREEK.

*Location.*—On the SW. ¼ Sec. 17, Tp. 9, Rge. 27, W. 3rd Mer., about fifty feet below headgate of irrigation ditch.

*Gauge.*—Vertical staff, fastened to post driven into bed of ditch. Zero maintained 0.85 feet below crest of permanent weir.

*Channel.*—Composed of gumbo.

*Discharge measurements.*—Made by measuring head over permanent weir, located ten feet below gauge rod.

*Control.*—A permanent sharp crested rectangular weir with thirty-six-inch crest.

*Observer.*—George Pollock.

*Remarks.*—This station was established May 19, 1914, by H. R. Carscallen. No water used during 1915 irrigation season.

GEORGE POLLOCK'S WEST DITCH FROM CYPRESS CREEK.

*Location.*—On the SW. ¼ Sec. 17, Tp. 9, Rge. 27, W. 3rd Mer., about 700 feet below headgate.

*Gauge.*—Vertical staff, fastened to post driven into the bed of the ditch near the left bank. Zero maintained at 0.61 feet below crest of permanent weir.

*Channel.*—Composed of gumbo.

*Discharge measurements.*—Made by measuring head over permanent weir.

*Control.*—A permanent sharp crested rectangular weir, ten feet below gauge rod, with thirty-six-inch crest.

*Observer.*—George Pollock.

*Remarks.*—This station was established May 19, 1914, by H. R. Carscallen. No water was used during irrigation season of 1915.

WM. SMALL DITCH FROM MCSHANE CREEK.

*Location.*—On the SE. ¼ Sec. 22, Tp. 9, Rge. 27, W. 3rd Mer., 1,500 feet below headgate.

*Gauge.*—Vertical staff driven into the bed of the ditch near the left bank. Zero maintained at 95.92 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark located on the left bank five feet below the gauge rod and two feet from edge of ditch.

*Channel.*—Composed of gravel and sand, slightly shifting.

*Discharge measurements.*—Made with meter or weir.

*Observer.*—Wm. Small.

*Remarks.*—This station was established November 22, 1915, by R. B. Williamson.

MCSHANE CREEK AT SMALL'S RANCH.

*Location.*—On the SW. ¼ Sec. 3, Tp. 10, Rge. 27, W. 3rd Mer., at the highway bridge, near Wm. Small's house.

*Records available.*—April 24, 1909, to April 24, 1915.

*Gauge.*—Vertical staff. Zero of gauge was maintained at 86.41 feet during 1909–10; zero of gauge was maintained at 85.71 feet during 1911–12; zero of gauge was maintained at 85.21 feet during 1913; zero of gauge was maintained at 85.74 feet during 1914–15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Composed of sand and gravel and shifting during flood stages.

*Discharge measurements.*—Made by wading or from the highway bridge during flood stages.

*Winter flow.*—Station discontinued during winter season.

*Observer.*—A. M. Small.

*Remarks.*—Gauge records were discontinued on April 24, 1915, as the records were not considered of sufficient value to justify the expense of obtaining them.

DISCHARGE MEASUREMENTS of McShane Creek at Small's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 15 | J. E. Caughey | 0.0 | ..... | ..... | 0.50 | Nil. |
| Mar. 31 | do | .....*a* | ..... | ..... | 0.43 | 0.16 |
| April 9 | do | 7.0 | 4.2 | 1.70 | 0.85 | 7.00 |
| April 16 | do | .....*a* | ..... | ..... | 0.70 | 0.97 |
| June 12 | H. W. Rowley | 9.0 | 3.9 | 0.42 | 0.72 | 1.64 |
| July 14 | do | 14.0 | 7.0 | 1.40 | 1.02 | 9.80 |
| July 28 | do | .....*a* | ..... | ..... | 0.58 | 0.49 |
| Aug. 26 | do | ..... | ..... | ..... | Dry. | Nil. |
| Sept. 18 | do | ..... | ..... | ..... | " | " |
| Oct. 15 | do | ..... | ..... | ..... | " | " |

*a* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of McShane Creek at Small's Ranch, for 1915.

| Day. | March. | | April. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 0.78 | 5.00 |
| 2 | ..... | ..... | 1.38 | 31.00 |
| 3 | ..... | ..... | 1.42 | 33.00 |
| 4 | ..... | ..... | 1.22 | 23.00 |
| 5 | ..... | ..... | 1.12 | 18.00 |
| 6 | ..... | ..... | 1.00 | 12.50 |
| 7 | ..... | ..... | 0.95 | 10.60 |
| 8 | ..... | ..... | 0.87 | 7.70 |
| 9 | ..... | ..... | 0.84 | 6.70 |
| 10 | ..... | ..... | 0.70 | 3.20 |
| 11 | ..... | ..... | 0.68 | 2.90 |
| 12 | ..... | ..... | 0.69 | 3.00 |
| 13 | ..... | ..... | 0.76 | 4.60 |
| 14 | ..... | ..... | 0.78 | 5.00 |
| 15 | ..... | ..... | 0.62 | 1.84 |
| 16 | ..... | ..... | 0.65 | 0.82 |
| 17 | 1.19*a* | 22.0 | 0.72 | 1.52 |
| 18 | 1.12 | 18.0 | 0.65 | 0.82 |
| 19 | 1.10 | 17.0 | 0.61 | 0.52 |
| 20 | 0.95 | 10.6 | 0.54 | 0.24 |
| 21 | 1.14 | 19.0 | 0.51 | 0.14 |
| 22 | 1.36 | 30.0 | 0.53 | 0.20 |
| 23 | 1.20 | 22.0 | 0.54 | 0.24 |
| 24 | 0.96 | 10.9 | 0.51 | 0.14 |
| 25 | 0.90 | 8.6 | .....*b* | ..... |
| 26 | 0.85 | 7.0 | ..... | ..... |
| 27 | 0.85 | 7.0 | ..... | ..... |
| 28 | 0.74 | 4.1 | ..... | ..... |
| 29 | 0.69 | 3.0 | ..... | ..... |
| 30 | 0.72 | 3.7 | ..... | ..... |
| 31 | 0.72 | 3.7 | ..... | ..... |

*a* Creek started to flow.
*b* Station discontinued.

MONTHLY DISCHARGE of McShane Creek at Small's Ranch, for 1915.

(Drainage area 27.5 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (17–31) | 30.00 | 3.00 | 12.5 | 0.454 | 0.25 | 371 |
| April (1–24)*a* | 33.00 | 0.14 | 7.2 | 0.262 | 0.20 | 343 |
| The period | | | | | 0.45 | 714 |

*a* Station discontinued April 24, 1915.

GAP CREEK AT SMALL'S RANCH.

*Location.*—On the SE. ¼ Sec. 4, Tp. 10, Rge. 27, W. 3rd Mer., at Wm. Small's ranch.

*Records available.*—April 24, 1909, to October 31, 1915.

*Gauge.*—Vertical staff. The zero of the gauge was maintained at 66.53 feet during 1909–10; the zero of the gauge was maintained at 66.62 feet during 1911; the zero of the gauge was maintained at 66.63 feet during 1912–15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Composed of loose stones and gravel and liable to shift during flood stages.

*Discharge measurements.*—Made from cable car during high stages, by wading or with a weir during low stages.

*Winter flow.*—Station discontinued during winter season.

*Observer.*—A. Small.

DISCHARGE MEASUREMENTS of Gap Creek at Small's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 15 | J. E. Caughey | 14 | 11.4 | 0.17 | 2.25 | 1.93 |
| Mar. 31 | do | 28 | 29.0 | 1.14 | 2.54 | 33.00 |
| April 9 | do | 29 | 33.8 | 1.40 | 2.67 | 46.00 |
| April 16 | do | 25 | 25.4 | 0.67 | 2.37 | 17.20 |
| April 29 | H. W. Rowley | *a* | | | 2.00 | 0.83 |
| May 27 | do | *a* | | | 2.09 | 2.00 |
| June 12 | do | 11 | 7.8 | 1.13 | 2.30 | 8.80 |
| July 14 | do | 33 | 48.0 | 1.90 | 3.02 | 91.00 |
| July 28 | do | 9 | 5.9 | 0.63 | 2.22 | 3.70 |
| Aug. 26 | do | | | | 1.81 | Nil. |
| Sept. 18 | do | | | | 1.88 | " |
| Oct. 15 | do | *a* | | | 2.07 | 1.57 |
| Nov. 3 | Whyte and Rowley | 8 | 4.0 | 0.20 | 2.02 | 0.80 |

*a* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Gap Creek at Small's Ranch, for 1915.

| Day | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.54 | 32.00 | 2.00 | 0.60 | 2.01 | 0.72 |
| 2 | ..... | ..... | 3.20 | 141.00 | 1.99 | 0.54 | 2.41 | 18.90 |
| 3 | ..... | ..... | 4.05 | 820.00 | 1.98 | 0.48 | 3.53 | 394.00 |
| 4 | ..... | ..... | 3.62 | 467.00 | 1.97 | 0.42 | 4.35 | 1,066.00 |
| 5 | ..... | ..... | 3.20 | 141.00 | 1.96 | 0.36 | 3.51 | 377.00 |
| 6 | ..... | ..... | 2.88 | 70.00 | 1.95 | 0.30 | 3.04 | 94.00 |
| 7 | ..... | ..... | 2.92 | 75.00 | 1.95 | 0.30 | 2.68 | 47.00 |
| 8 | ..... | ..... | 2.86 | 67.00 | 1.95 | 0.30 | 2.56 | 34.00 |
| 9 | ..... | ..... | 2.72 | 51.00 | 1.95 | 0.30 | 2.40 | 18.00 |
| 10 | ..... | ..... | 2.62 | 40.00 | 1.94 | 0.26 | 2.33 | 12.00 |
| 11 | ..... | ..... | 2.52 | 30.00 | 1.94 | 0.26 | 2.31 | 10.50 |
| 12 | ..... | ..... | 2.48 | 26.00 | 1.94 | 0.26 | 2.30 | 9.80 |
| 13 | ..... | ..... | 2.58 | 36.00 | 1.95 | 0.30 | 2.30 | 9.80 |
| 14 | ..... | ..... | 2.60 | 38.00 | 2.10 | 2.20 | 2.25 | 7.00 |
| 15 | ..... | ..... | 2.48 | 26.00 | 2.73 | 52.00 | 2.22 | 5.70 |
| 16 | ..... | ..... | 2.36 | 14.00 | 3.16 | 126.00 | 2.14 | 3.10 |
| 17 | ..... | ..... | 2.36 | 14.00 | 2.72 | 51.00 | 2.14 | 3.10 |
| 18 | 2.55 | 33 | 2.32 | 11.00 | 2.35 | 13.50 | 2.14 | 3.10 |
| 19 | 3.49 | 361 | 2.27 | 8.00 | 2.25 | 7.00 | 2.15 | 3.30 |
| 20 | 3.54 | 402 | 2.24 | 6.60 | 2.15 | 3.30 | 2.35 | 13.50 |
| 21 | 3.58 | 435 | 2.16 | 3.60 | 2.12 | 2.60 | 2.28 | 8.70 |
| 22 | 4.00 | 779 | 2.15 | 3.30 | 2.08 | 1.80 | 2.23 | 6.10 |
| 23 | 4.10 | 861 | 2.14 | 3.10 | 2.08 | 1.80 | 2.15 | 3.30 |
| 24 | 3.43 | 311 | 2.13 | 2.90 | 2.06 | 1.40 | 2.11 | 2.40 |
| 25 | 3.27 | 183 | 2.13 | 2.90 | 2.06 | 1.40 | 2.08 | 1.80 |
| 26 | 3.10 | 108 | 2.10 | 2.20 | 2.07 | 1.60 | 2.13 | 2.90 |
| 27 | 2.84 | 65 | 2.05 | 1.20 | 2.07 | 1.60 | 2.19 | 4.50 |
| 28 | 2.70 | 49 | 2.03 | 0.96 | 2.05 | 1.20 | 2.12 | 2.60 |
| 29 | 2.74 | 53 | 2.00 | 0.60 | 2.05 | 1.20 | 2.12 | 2.60 |
| 30 | 2.71 | 50 | 1.99 | 0.54 | 2.05 | 1.20 | 2.11 | 2.40 |
| 31 | 2.59 | 37 | ..... | ..... | 2.03 | 0.96 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Gap Creek at Small's Ranch, for 1915.—*Concluded.*

| DAY. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.10 | 2.20 | 2.48 | 26.00 | 1.81 | Nil. | 1.88 | 0.06 |
| 2 | 2.08 | 1.80 | 2.46 | 24.00 | 1.89 | 0.08 | 1.88 | 0.06 |
| 3 | 2.04 | 1.08 | 2.46 | 24.00 | 1.84 | Nil. | 2.13 | 2.90 |
| 4 | 2.01 | 0.72 | 2.45 | 23.00 | 1.84 | " | 2.10 | 2.20 |
| 5 | 2.01 | 0.72 | 2.40 | 18.00 | 1.83 | " | 2.10 | 2.20 |
| 6 | 1.98 | 0.48 | 2.36 | 14.00 | 1.83 | " | 2.09 | 2.00 |
| 7 | 1.97 | 0.42 | 2.32 | 11.00 | 1.86 | 0.02 | 2.07 | 1.60 |
| 8 | 2.24 | 6.60 | 2.25 | 7.00 | 1.88 | 0.06 | 2.04 | 1.08 |
| 9 | 2.24 | 6.60 | 2.12 | 2.60 | 1.88 | 0.06 | 2.04 | 1.08 |
| 10 | 2.30 | 9.80 | 2.04 | 1.08 | 1.87 | 0.04 | 2.10 | 2.20 |
| 11 | 2.23 | 6.10 | 2.04 | 1.08 | 1.86 | 0.02 | 2.16 | 3.60 |
| 12 | 2.12 | 2.60 | 2.02 | 0.84 | 1.86 | 0.02 | 2.15 | 3.30 |
| 13 | 2.63 | 41.00 | 1.96 | 0.36 | 1.88 | 0.06 | 2.14 | 3.10 |
| 14 | 2.93 | 76.00 | 1.93 | 0.22 | 1.90 | 0.10 | 2.10 | 2.20 |
| 15 | 2.63 | 41.00 | 1.93 | 0.22 | 1.93 | 0.22 | 2.07 | 1.60 |
| 16 | 2.39 | 17.10 | 1.93 | 0.22 | 1.93 | 0.22 | 2.04 | 1.08 |
| 17 | 2.45 | 23.00 | 1.90 | 0.10 | 1.88 | 0.06 | 2.04 | 1.08 |
| 18 | 2.85 | 66.00 | 1.90 | 0.10 | 1.88 | 0.06 | 2.00 | 0.60 |
| 19 | 2.55 | 33.00 | 1.90 | 0.10 | 1.90 | 0.10 | 2.03 | 0.96 |
| 20 | 2.38 | 16.20 | 1.90 | 0.10 | 1.93 | 0.22 | 2.03 | 0.96 |
| 21 | 2.30 | 9.80 | 1.90 | 0.10 | 1.93 | 0.22 | 2.06 | 0.60 |
| 22 | 2.25 | 7.00 | 1.90 | 0.10 | 1.90 | 0.10 | 2.01 | 0.72 |
| 23 | 2.70 | 49.00 | 1.90 | 0.10 | 1.88 | 0.06 | 2.03 | 0.96 |
| 24 | 2.70 | 49.00 | 1.89 | 0.08 | 1.88 | 0.06 | 2.03 | 0.96 |
| 25 | 2.45 | 23.00 | 1.88 | 0.06 | 1.88 | 0.06 | 2.03 | 0.96 |
| 26 | 2.32 | 11.00 | 1.84 | Nil. | 1.87 | 0.04 | 2.01 | 0.72 |
| 27 | 2.24 | 6.60 | 1.83 | " | 1.87 | 0.04 | 2.04 | 1.08 |
| 28 | 2.20 | 4.80 | 1.82 | " | 1.87 | 0.04 | 2.02 | 0.84 |
| 29 | 2.70 | 49.00 | 1.81 | " | 1.87 | 0.04 | 2.03 | 0.96 |
| 30 | 2.51 | 29.00 | 1.81 | " | 1.88 | 0.06 | 1.94 | 0.26 |
| 31 | 2.49 | 27.00 | 1.80 | " | ..... | ..... | 1.96 | 0.36 |

MONTHLY DISCHARGE of Gap Creek at Small's Ranch, for 1915.

(Drainage area 108 square miles.)

| MONTH | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area | Total in Acre-feet. |
| March (18-31) | 861.00 | 33.00 | 266.00 | 2.460000 | 1.2800 | 7,391 |
| April | 820.00 | 0.54 | 71.00 | 0.659000 | 0.7400 | 4,225 |
| May | 126.00 | 0.26 | 8.90 | 0.082400 | 0.1000 | 547 |
| June | 1,066.00 | 0.72 | 72.00 | 0.667000 | 0.7400 | 4,284 |
| July | 76.00 | 0.42 | 19.90 | 0.184000 | 0.2100 | 1,224 |
| August | 26.00 | 0.00 | 5.60 | 0.046300 | 0.0500 | 307 |
| September | 0.22 | 0.00 | 0.07 | 0.000648 | 0.0007 | 4 |
| October | 3.60 | 0.06 | 1.35 | 0.012500 | 0.0100 | 83 |
| The period | | | | | 3.1307 | 18,065 |

GAP CREEK NEAR MAPLE CREEK.

*Location.*—On the road allowance east of the NE. ¼ Sec. 31, Tp. 11, Rge. 26, W. 3rd Mer., at the highway traffic bridge.

*Records available.*—May 4, 1910, to April 30, 1915.

*Gauge.*—Vertical staff. The zero of the gauge was maintained at 81.44 feet during 1910–11; the zero of the gauge was maintained at 81.61 feet during 1912–15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Composed of sand and shifting.

*Discharge measurements.*—Made from bridge, by wading or with a weir.

*Winter flow.*—Station discontinued during winter season.

*Observer.*—Miss Kate Williams.

*Remarks.*—Gauge height records were discontinued at this station on April 30, 1915, as a new station was established on Maple Creek below Gap Creek.

DISCHARGE MEASUREMENTS of Gap Creek near Maple Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 22 | J. E. Caughey | 47 | 103.6 | 1.82 | 3.88 | 189 |
| April 1 | do | 28 | 25.0 | 1.21 | 2.19 | 33 |
| April 5 | do | 47 | 141.5 | 2.01 | 4.35 | 284 |
| April 8 | do | 30 | 39.1 | 1.70 | 2.63 | 66 |
| April 15 | do | 28 | 29.4 | 1.32 | 2.18 | 38 |
| June 7 | R. J. McGuinness | 47 | 105.6 | 1.36 | 3.24 | 143 |

DAILY GAUGE HEIGHT AND DISCHARGE of Gap Creek near Maple Creek, for 1915.

| Day. | March. | | April. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.19 | 36.0 |
| 2 | ..... | ..... | 2.99 | 94.0 |
| 3 | ..... | ..... | 6.62 | 1,167.0 |
| 4 | ..... | ..... | 6.58 | 1,151.0 |
| 5 | ..... | ..... | 6.44 | 1,095.0 |
| 6 | ..... | ..... | 6.37 | 1,067.0 |
| 7 | ..... | ..... | 6.31 | 1,043.0 |
| 8 | ..... | ..... | 6.23 | 1,011.0 |
| 9 | ..... | ..... | 6.10 | 959.0 |
| 10 | ..... | ..... | 5.09 | 555.0 |
| 11 | ..... | ..... | 4.10 | 226.0 |
| 12 | ..... | ..... | 3.90 | 192.0 |
| 13 | ..... | ..... | 2.23 | 39.0 |
| 14 | ..... | ..... | 2.11 | 32.0 |
| 15 | ..... | ..... | 2.08 | 30.0 |
| 16 | ..... | ..... | 2.00 | 26.0 |
| 17 | ..... | ..... | 1.81 | 17.4 |
| 18 | ..... | ..... | 1.69 | 12.7 |
| 19 | ..... | ..... | 1.56 | 8.8 |
| 20 | ..... | ..... | 1.56 | 8.8 |
| 21 | 3.18 | 110 | 1.56 | 8.8 |
| 22 | 3.88 | 189 | 1.55 | 7.5 |
| 23 | 5.78 | 831 | 1.55 | 7.5 |
| 24 | 4.59 | 358 | 1.54 | 7.2 |
| 25 | 5.39 | 675 | 1.54 | 7.2 |
| 26 | 4.25 | 259 | 1.54 | 7.2 |
| 27 | 3.11 | 104 | 1.54 | 7.2 |
| 28 | 2.99 | 94 | 1.54 | 7.2 |
| 29 | 2.40 | 49 | 1.54 | 7.2 |
| 30 | 2.42 | 50 | 1.54 | 7.2 |
| 31 | 2.29 | 42 | ..... | ..... |

MONTHLY DISCHARGE of Gap Creek near Maple Creek, for 1915.

(Drainage area 274 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (21–31) | 839 | 42.0 | 251 | 0.916 | 0.37 | 5,475 |
| April | 1,167 | 7.2 | 295 | 1.080 | 1.20 | 17,554 |
| The period | ..... | ..... | ..... | ..... | 1.57 | 23,029 |

MAPLE CREEK AT MAPLE CREEK.

*Location.*—On the NE. ¼ Sec. 16, Tp. 11, Rge. 26, W. 3rd Mer., at the first highway bridge, north of the town of Maple Creek.

*Records available.*—May 13, 1908, to April 30, 1915.

*Gauge.*—Vertical staff. Zero of gauge was maintained at 2492.64 feet during 1908–09–10–11–14–15, and at 2492.71 during the years of 1912–13.

*Bench-mark.*—Permanent iron bench-mark. Elevation 2499.875 feet above sea level which is referred to the Geodetic Survey bench-mark No. 145c, on the northeast corner of the post office at Maple Creek, Sask., the elevation of which is 2510.39 feet above mean sea level.

*Channel.*—Composed of sand and may shift during flood stages.

*Discharge measurements.*—Made from the bridge by wading or with a weir.

*Winter flow.*—Station discontinued during winter season.

*Observer.*—Miss Kate Williams.

*Remarks.*—Gauge height records were discontinued May 1, as it was considered that the records were not of sufficient value to warrant the expense of keeping two stations so close together on Maple creek. Records are available at the lower station.

DISCHARGE MEASUREMENTS of Maple Creek at Maple Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 22 | J. E. Caughey | 36 | 39.0 | 0.70 | 2.85 | 28.0 |
| Mar. 31 | do | 12 | 13.0 | 0.70 | 1.84 | 9.2 |
| April 5 | do | 41 | 83.5 | 1.12 | 3.46 | 94.0 |
| April 9 | do | 34 | 42.6 | 0.75 | 2.36 | 32.0 |
| April 15 | do | 19 | 19.6 | 0.80 | 1.96 | 15.8 |

DAILY GAUGE HEIGHT AND DISCHARGE of Maple Creek at Maple Creek, for 1915.

| Day. | March. | | April. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.28*b* | 25.00 |
| 2 | ..... | ..... | 2.59 | 38.00 |
| 3 | ..... | ..... | 4.52 | 186.00 |
| 4 | ..... | ..... | 4.18 | 155.00 |
| 5 | ..... | ..... | 3.46 | 93.00 |
| 6 | ..... | ..... | 3.60 | 104.00 |
| 7 | ..... | ..... | 3.43 | 90.00 |
| 8 | ..... | ..... | 3.38 | 87.00 |
| 9 | ..... | ..... | 3.28 | 80.00 |
| 10 | ..... | ..... | 3.00 | 61.00 |
| 11 | ..... | ..... | 2.16 | 21.00 |
| 12 | ..... | ..... | 2.19 | 22.00 |
| 13 | ..... | ..... | 2.09 | 18.70 |
| 14 | ..... | ..... | 1.80 | 11.00 |
| 15 | ..... | ..... | 1.00 | 0.70 |
| 16 | ..... | ..... | 1.00 | 0.70 |
| 17 | 1.60*a* | 7.0 | 1.20 | 2.00 |
| 18 | 1.70 | 9.0 | 1.26 | 2.60 |
| 19 | 2.42 | 31.0 | 1.29 | 2.90 |
| 20 | 2.70 | 44.0 | 1.32 | 3.20 |
| 21 | 2.01 | 16.0 | 1.34 | 3.40 |
| 22 | 2.90 | 55.0 | 1.37 | 3.70 |
| 23 | 3.80 | 121.0 | 1.39 | 3.90 |
| 24 | 3.90 | 130.0 | 1.39 | 3.90 |
| 25 | 3.00 | 61.0 | 1.20 | 2.00 |
| 26 | 2.85 | 52.0 | 1.13 | 1.46 |
| 27 | 2.70 | 44.0 | 1.13 | 1.46 |
| 28 | 2.52 | 35.0 | 1.13 | 1.46 |
| 29 | 2.48 | 33.0 | 1.15 | 1.60 |
| 30 | 2.20 | 22.0 | 1.15 | 1.60*c* |
| 31 | 1.96 | 14.5 | ..... | ..... |

*a* Creek started to run March 17.
*b* Gauge height interpolated.
*c* Station discontinued April 30.

MONTHLY DISCHARGE of Maple Creek at Maple Creek, for 1915.

(Drainage area 81 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (17-31) | 130.0 | Nil. | 22.0 | 0.269 | 0.31 | 1,340 |
| April | 186.0 | 1.46 | 34.0 | 0.420 | 0.47 | 2,023 |
| The period | ..... | ..... | ..... | ..... | 0.78 | 3,363 |

MAPLE CREEK NEAR MAPLE CREEK.

*Location.*—On the SE. ¼ Sec. 28, Tp. 11, Rge. 26. W. 3rd Mer.
*Records available.*—May 4, 1910, to October 31, 1915.
*Gauge.*—Vertical staff. Zero of gauge was maintained at 81.64 feet during 1910-11; 81.60 feet during 1912-15.
*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.
*Channel.*—Composed of sand, and liable to shift during floods.
*Discharge measurements.*—Made with cable and weights from bridge, or by wading or with a weir for low stages.

*Artificial control.*—On May 28 a control was built fifty feet below the gauge at this station consisting of timbers jointed so as to form a V notch weir faced on the upstream side with board piling, and securely anchored to the bed of the stream and banks by posts.

*Winter flow.*—Station discontinued during the winter season.

*Observer.*—Miss Kate Williams.

DISCHARGE MEASUREMENTS of Maple Creek near Maple Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 22 | J. E. Caughey | 62 | 25.4 | 1.12 | 6.21 | 82.00 |
| Mar. 31 | do | 12 | 6.1 | 0.65 | 3.10 | 4.00 |
| April 5 | do | 42 | 98.8 | 0.87 | 5.24 | 86.00 |
| April 8 | do | 29 | 30.0 | 1.18 | 4.19 | 36.00 |
| April 15 | do | 24 | 21.0 | 0.91 | 3.79 | 19.00 |
| May 29 | H. W. Rowley | ...*b* | ... | ... | 3.14*a* | 0.88 |
| June 7 | R. J. McGuinness | 35 | 60.2 | 0.55 | 4.46 | 34.00 |
| June 11 | H. W. Rowley | 11 | 5.9 | 0.75 | 3.37 | 4.40 |
| July 2 | do | ...*b* | ... | ... | 3.20 | 0.16 |
| July 13 | do | 12 | 11.0 | 1.10 | 3.72 | 12.10 |
| July 27 | do | 9 | 9.4 | 1.00 | 3.56 | 9.40 |
| Aug. 25 | do | ...*b* | ... | ... | 3.06 | 0.41 |
| Sept. 17 | do | ...*b* | ... | ... | 3.10 | 0.42 |
| Oct. 14 | do | ...*b* | ... | ... | 3.09 | 0.30 |
| Nov. 2 | do | ...*b* | ... | ... | 3.06 | 0.19 |

*a* Artificial control constructed 50 feet below gauge May 28th.
*b* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Maple Creek near Maple Creek, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ... | ... | 3.48*c* | 10.10 | 2.68 | 1.12 | 3.19*c* | 1.39 |
| 2 | ... | ... | 3.83 | 20.00 | 2.68 | 1.12 | 3.47*c* | 6.70 |
| 3 | ... | ... | 5.93 | 120.00 | 2.65 | 1.00 | 3.75*c* | 13.00 |
| 4 | ... | ... | 5.83 | 116.00 | 2.63 | 0.92 | 4.02*c* | 19.90 |
| 5 | ... | ... | 4.94 | 71.00 | 2.63 | 0.92 | 4.30 | 28.00 |
| 6 | ... | ... | 4.80 | 64.00 | 2.64 | 0.96 | 4.27 | 27.00 |
| 7 | ... | ... | 4.63 | 56.00 | 2.64 | 0.96 | 4.21 | 25.00 |
| 8 | ... | ... | 4.41 | 46.00 | 2.64 | 0.96 | 4.16 | 24.00 |
| 9 | ... | ... | 4.33 | 42.00 | 2.64 | 0.96 | 3.76 | 13.20 |
| 10 | ... | ... | 4.26 | 39.00 | 2.63 | 0.92 | 3.57*c* | 8.80 |
| 11 | ... | ... | 4.12 | 33.00 | 2.63 | 0.92 | 3.38 | 4.80 |
| 12 | ... | ... | 3.85 | 21.00 | 2.64 | 0.96 | 3.33 | 3.80 |
| 13 | ... | ... | 3.81 | 19.80 | 2.78*c* | 1.52 | 3.34 | 4.00 |
| 14 | ... | ... | 3.74 | 17.40 | 2.92*c* | 2.20 | 3.36 | 4.40 |
| 15 | ... | ... | 3.77 | 18.40 | 3.06*c* | 3.40 | 3.36 | 4.40 |
| 16 | ... | ... | 3.50 | 10.50 | 3.19 | 4.90 | 3.36 | 4.40 |
| 17 | ... | ... | 3.46 | 9.70 | 3.39 | 8.20 | 3.39 | 5.00 |
| 18 | ... | ... | 3.40 | 8.40 | 3.50 | 10.50 | 3.39 | 5.00 |
| 19 | ... | ... | 3.20 | 5.00 | 2.88 | 2.00 | 3.38*c* | 4.80 |
| 20 | ... | ... | 3.10 | 3.80 | 2.91 | 2.20 | 3.37 | 4.60 |
| 21 | 6.34*a* | 88 | 3.00 | 2.80 | 2.88 | 2.00 | 3.35 | 4.20 |
| 22 | 6.25 | 84 | 2.80 | 1.60 | 2.80 | 1.60 | 3.35 | 4.20 |
| 23 | 6.04 | 111 | 2.50 | 0.60 | 2.80 | 1.60 | 3.33 | 3.80 |
| 24 | 6.63 | 118 | 2.02 | 0.00 | 2.78 | 1.52 | 3.33 | 3.80 |
| 25 | 6.36 | 114 | 2.60 | 0.80 | 2.75 | 1.40 | 3.33*c* | 3.80 |
| 26 | 6.00 | 104 | 2.80 | 1.60 | 2.71 | 1.24 | 3.30*c* | 3.20 |
| 27 | 5.63 | 94 | 2.80 | 1.60 | 2.90 | 2.10 | 3.30 | 3.20 |
| 28 | 5.45 | 92 | 2.80*c* | 1.60 | 3.15 | 4.40 | 3.30 | 3.20 |
| 29 | 5.14 | 83 | 2.79 | 1.56 | 3.17 | 1.18 | 3.32 | 3.60 |
| 30 | 4.63 | 56 | 2.70 | 1.20 | 3.19 | 1.39 | 3.32 | 3.60 |
| 31 | 3.14*b* | 4 | ... | ... | 3.19 | 1.39 | ... | ... |

*a* to *b* Shifting ice conditions.
*c* Gauge height interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of Maple Creek near Maple Creek, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 3.32 | 3.60 | 3.04 | 0.29 | 3.08 | 0.38 | 3.01 | 0.22 |
| 2 | 3.33 | 3.80 | 3.04 | 0.29 | 3.08 | 0.38 | 3.01 | 0.22 |
| 3 | 3.33 | 3.80 | 3.04 | 0.29 | 3.08 | 0.38 | 3.01 | 0.22 |
| 4 | 3.30 | 3.20 | 3.04 | 0.29 | 3.11 | 0.53 | 3.01 | 0.22 |
| 5 | 3.30 | 3.20 | 3.04 | 0.29 | 3.20 | 1.50 | 3.04 | 0.29 |
| 6 | 3.35*a* | 4.20 | 3.04 | 0.29 | 3.25*a* | 2.40 | 3.02 | 0.24 |
| 7 | 3.40 | 5.20 | 3.04 | 0.29 | 3.31 | 3.40 | 3.02*a* | 0.24 |
| 8 | 4.70*a* | 43.00 | 3.03 | 0.29 | 3.20*a* | 1.50 | 3.01 | 0.22 |
| 9 | 6.00 | 103.00 | 3.03 | 0.27 | 3.08 | 0.38 | 3.01 | 0.22 |
| 10 | 5.60 | 83.00 | 3.03 | 0.27 | 3.04 | 0.29 | 3.10 | 0.42 |
| 11 | 5.38 | 72.00 | 3.03 | 0.27 | 3.02 | 0.24 | 3.10 | 0.42 |
| 12 | 4.10 | 22.00 | 3.02 | 0.24 | 3.02 | 0.24 | 3.10 | 0.42 |
| 13 | 3.72 | 12.30 | 3.02 | 0.24 | 3.03 | 0.27 | 3.10 | 0.42 |
| 14 | 4.11*a* | 22.00 | 3.01 | 0.22 | 3.05 | 0.31 | 3.09 | 0.40 |
| 15 | 4.50 | 35.00 | 3.03 | 0.27 | 3.07 | 0.35 | 3.10 | 0.42 |
| 16 | 4.07 | 21.00 | 3.03 | 0.27 | 3.09 | 0.40 | 3.10 | 0.42 |
| 17 | 4.00 | 19.40 | 3.03 | 0.27 | 3.10 | 0.42 | 3.10 | 0.42 |
| 18 | 3.60 | 9.50 | 3.03 | 0.27 | 3.08 | 0.38 | 3.10 | 0.42 |
| 19 | 3.50 | 7.30 | 3.03 | 0.27 | 3.04 | 0.29 | 3.10 | 0.42 |
| 20 | 3.72 | 12.30 | 3.03 | 0.27 | 3.03 | 0.27 | 3.10 | 0.42 |
| 21 | 3.50 | 7.30 | 3.05 | 0.31 | 3.01 | 0.22 | 3.10 | 0.42 |
| 22 | 3.50 | 7.30 | 3.05 | 0.31 | 3.01 | 0.22 | 3.10 | 0.42 |
| 23 | 3.60 | 9.50 | 3.05 | 0.31 | 3.01 | 0.22 | 3.10 | 0.42 |
| 24 | 3.70 | 11.80 | 3.05 | 0.31 | 3.01 | 0.22 | 3.10 | 0.42 |
| 25 | 3.50 | 7.30 | 3.06 | 0.33 | 3.01 | 0.22 | 3.10 | 0.42 |
| 26 | 3.50 | 7.30 | 3.07 | 0.35 | 3.01 | 0.22 | 3.10 | 0.42 |
| 27 | 3.56 | 8.60 | 3.07 | 0.35 | 3.01 | 0.22 | 3.10 | 0.42 |
| 28 | 3.40 | 5.20 | 3.07 | 0.35 | 3.01 | 0.22 | 3.10 | 0.42 |
| 29 | 3.04 | 0.29 | 3.07 | 0.35 | 3.01 | 0.22 | 3.10 | 0.42 |
| 30 | 3.04 | 0.29 | 3.07 | 0.35 | 3.01 | 0.22 | 3.10 | 0.42 |
| 31 | 3.04 | 0.29 | 3.07 | 0.35 | ..... | ..... | 3.10 | 0.42 |

*a* Gauge height interpolated.

MONTHLY DISCHARGE of Maple Creek near Maple Creek, for 1915.

(Drainage area 82 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (21-31) | 118.00 | 4.00 | 86.00 | 1.05000 | 0.4300 | 1,880 |
| April | 120.00 | Nil. | 25.00 | 0.30500 | 0.3400 | 1,488 |
| May | 10.50 | 0.92 | 2.10 | 0.02560 | 0.0300 | 129 |
| June | 28.00 | 1.39 | 8.30 | 0.10100 | 0.1100 | 494 |
| July | 103.00 | 0.29 | 17.90 | 0.22000 | 0.2500 | 1,101 |
| August | 0.35 | 0.22 | 0.29 | 0.00354 | 0.0040 | 18 |
| September | 3.40 | 0.22 | 0.55 | 0.00671 | 0.0075 | 33 |
| October | 0.42 | 0.22 | 0.36 | 0.00439 | 0.0050 | 22 |
| The period | ..... | ..... | ..... | ..... | 1.1765 | 5,165 |

MAPLE CREEK AT DIXON'S RANCH.

*Location.*—On the NE. ¼ Sec. 5, Tp. 12, Rge. 26, W. 3rd Mer., at Joseph Dixon's ranch, four miles north and one mile west of the town of Maple Creek.

*Records available.*—May 1 to October 31, 1915.

*Gauge.*—Vertical staff nailed to a 4-inch x 4-inch post driven into the bed of the stream near the right bank and braced by two 2-inch x 4 inch to the right bank, 150 feet upstream from the natural rock control and trail crossing. Zero elevation maintained at 89.82 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark forty feet west of gauge rod. Assumed elevation 100.00 feet.

*Channel.*—Practically permanent, channel at all stages composed of clay and rock.

*Discharge measurements.*—Made by wading or from highway bridge three-quarters of a mile upstream during flood stages.

*Winter flow.*—Station discontinued during winter season.

*Observer.*—Miss Agnes Dixon.

DISCHARGE MEASUREMENTS of Maple Creek at Dixon's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 28 | J. E. Caughey | 6.2 | 3.82 | 2.82 | 1.92 | 10.80 |
| May 4 | H. W. Rowley | 5.7 | 1.94 | 1.42 | 1.77 | 2.70 |
| May 29 | do | 7.0 | 3.00 | 1.65 | 1.84 | 5.00 |
| June 7 | R. J. McGuinness | 32.0 | 93.87 | 1.94 | 3.40 | 182.00 |
| June 11 | H. W. Rowley | 20.0 | 1.97 | 1.28 | 2.25 | 25.00 |
| July 2 | do | 6.0 | 2.70 | 1.50 | 1.85 | 4.00 |
| July 13 | do | 19.0 | 17.80 | 1.14 | 2.17 | 20.00 |
| July 27 | do | 20.0 | 18.80 | 1.10 | 2.20 | 21.00 |
| Aug. 25 | do | ....*a* | .... | .... | 1.65 | 0.48 |
| Sept. 16 | do | ....*a* | .... | .... | 1.68 | 0.67 |
| Oct. 14 | do | ....*a* | .... | .... | 1.81 | 3.20 |
| Nov. 2 | do | ....*a* | .... | .... | 1.68 | 0.68 |

*a* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Maple Creek at Dixon's Ranch, for 1915.

| Day. | May. | | June. | | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.89 | 5.9 | 1.84 | 4.5 | 1.86*a* | 5.0 | 2.13*a* | 17.20 | 1.53 | 0.09 | 1.74 | 2.20 |
| 2 | 1.88 | 5.6 | 1.85 | 4.8 | 1.86 | 5.0 | 2.01 | 10.70 | 1.68 | 1.18 | 1.78 | 2.90 |
| 3 | 1.82*a* | 3.9 | 2.35 | 32.0 | 1.84 | 4.5 | 2.00 | 10.20 | 1.80 | 3.30 | 1.82 | 3.90 |
| 4 | 1.77 | 2.7 | 4.00 | 386.0 | 1.83 | 4.2 | 1.97 | 9.00 | 1.75 | 2.40 | 1.82 | 3.90 |
| 5 | 1.76 | 2.5 | 4.56 | 576.0 | 1.81 | 3.6 | 1.87 | 5.30 | 1.75 | 2.40 | 1.77 | 2.70 |
| 6 | 1.75 | 2.4 | 3.86 | 338.0 | 1.80 | 3.3 | 1.86 | 5.00 | 1.74 | 2.20 | 1.86 | 3.30 |
| 7 | 1.75 | 2.4 | 3.84 | 332.0 | 1.81 | 3.6 | 1.85 | 4.80 | 1.73 | 2.00 | 1.82 | 3.90 |
| 8 | 1.75 | 2.4 | 2.69 | 59.0 | 1.91 | 6.6 | 1.78 | 2.90 | 1.71 | 1.59 | 1.78 | 2.90 |
| 9 | 1.74 | 2.2 | 2.56 | 48.0 | 3.05 | 102.0 | 1.77 | 2.70 | 1.71 | 1.59 | 1.80 | 3.30 |
| 10 | 1.73 | 2.0 | 2.40 | 35.0 | 2.35 | 32.0 | 1.76 | 2.50 | 1.61 | 0.74 | 1.79 | 3.10 |
| 11 | 1.73 | 2.0 | 2.24 | 24.0 | 2.37 | 33.0 | 1.76 | 2.50 | 1.64 | 0.74 | 1.78 | 2.90 |
| 12 | 1.70 | 1.4 | 2.28 | 27.0 | 2.47 | 41.0 | 1.76 | 2.50 | 1.61 | 0.74 | 1.76 | 2.50 |
| 13 | 1.70 | 1.4 | 2.12 | 16.6 | 2.17 | 19.7 | 1.77*a* | 2.70 | 1.65 | 0.85 | 1.75 | 2.40 |
| 14 | 1.80 | 3.3 | 2.10 | 15.4 | 3.25 | 141.0 | 1.78 | 2.90 | 1.66 | 0.96 | 1.81 | 3.60 |
| 15 | 1.94 | 7.8 | 2.05 | 12.8 | 3.27 | 146.0 | 1.78 | 2.90 | 1.65 | 0.85 | 1.80 | 3.30 |
| 16 | 2.94 | 86.0 | 2.02*a* | 11.2 | 2.81 | 71.0 | 1.77 | 2.70 | 1.68 | 1.18 | 1.80 | 3.30 |
| 17 | 3.95 | 369.0 | 2.00 | 10.2 | 2.47 | 41.0 | 1.78 | 2.90 | 1.65 | 0.85 | 1.75 | 2.40 |
| 18 | 3.10*a* | 110.0 | 1.96 | 8.6 | 2.25 | 25.0 | 1.79 | 3.10 | 1.61 | 0.74 | 1.72 | 1.78 |
| 19 | 2.25 | 25.0 | 1.98 | 9.4 | 2.45 | 39.0 | 1.79*a* | 3.10 | 1.65 | 0.85 | 1.74 | 2.20 |
| 20 | 2.24 | 24.0 | 1.97 | 9.0 | 2.55 | 47.0 | 1.79 | 3.10 | 1.65 | 0.85 | 1.75 | 2.40 |
| 21 | 2.08 | 11.4 | 2.00 | 10.2 | 2.35 | 32.0 | 1.72*a* | 1.78 | 1.66 | 0.96 | 1.74 | 2.20 |
| 22 | 1.95 | 8.2 | 2.05 | 12.8 | 2.20*a* | 22.0 | 1.65 | 0.85 | 1.65 | 0.85 | 1.73 | 2.00 |
| 23 | 1.93 | 7.4 | 2.00 | 13.3 | 2.05 | 12.8 | 1.65 | 0.85 | 1.65 | 0.85 | 1.72 | 1.78 |
| 24 | 1.90 | 6.2 | 1.99 | 9.8 | 3.30 | 153.0 | 1.65*a* | 0.85 | 1.61 | 0.74 | 1.70 | 1.40 |
| 25 | 1.85 | 4.8 | 1.94*a* | 7.8 | 2.75 | 65.0 | 1.65 | 0.85 | 1.61 | 0.74 | 1.66 | 0.96 |
| 26 | 1.84*a* | 4.5 | 1.90 | 6.2 | 2.45 | 39.0 | 1.64 | 0.74 | 1.65 | 0.85 | 1.67 | 1.07 |
| 27 | 1.84 | 4.5 | 1.89 | 5.9 | 2.20 | 22.0 | 1.60 | 0.30 | 1.65 | 0.85 | 1.68 | 1.18 |
| 28 | 1.82 | 3.9 | 1.85 | 4.8 | 2.15 | 18.4 | 1.58 | 0.24 | 1.60 | 0.98 | 1.67 | 1.07 |
| 29 | 1.84 | 4.5 | 1.85 | 4.8 | 2.05 | 12.8 | 1.54 | 0.12 | 1.60 | 1.20 | 1.70 | 1.40 |
| 30 | 1.82 | 3.9 | 1.87 | 5.3 | 2.25 | 25.0 | 1.54 | 0.12 | 1.72 | 1.78 | 1.65 | 0.96 |
| 31 | 1.81 | 3.6 | | | 2.25 | 25.0 | 1.55 | 0.15 | | | 1.66 | 0.86 |

*a* Gauge height interpolated.

MONTHLY DISCHARGE of Maple Creek at Dixon's Ranch, for 1915.

(Drainage area 375 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| May | 369.00 | 1.40 | 24.00 | 0.06400 | 0.070 | 1,476 |
| June | 576.00 | 4.50 | 68.00 | 0.18200 | 0.200 | 4,046 |
| July | 153.00 | 3.30 | 39.00 | 0.10400 | 0.120 | 2,398 |
| August | 17.20 | 0.12 | 3.40 | 0.00907 | 0.010 | 209 |
| September | 3.30 | 0.09 | 1.20 | 0.00320 | 0.004 | 71 |
| October | 3.90 | 0.96 | 2.40 | 0.00640 | 0.007 | 148 |
| The period | ..... | ..... | ..... | ..... | 0.411 | 8,348 |

### DIXON DITCH FROM MAPLE CREEK.

*Location.*—On the SE. ¼ Sec. 17, Tp. 12, Rge. 26, W. 3rd Mer.

*Gauge.*—Vertical staff, situated at the headgate. Zero elevation maintained at 95.88 feet since establishment.

*Bench-mark.*—On top of wooden plug used as I. P. of soundings about 190 feet north of headgate. Assumed elevation, 100.00 feet.

*Channel.*—One channel, clay bed.

*Discharge measurements.*—Made with meter or weir.

*Observer.*—Jos. Dixon.

*Remarks.*—This station was established on June 4, 1911, by H. M. Goodman. Water was used in irrigation season of 1915, but no records were obtained.

## MANY ISLAND LAKE DRAINAGE BASIN.

*General Description.*

Many Island Lake is about twenty-five square miles in area, and is situated on the boundary line between the provinces of Alberta and Saskatchewan, about ten miles north of the town of Walsh. It is the farthest west of the several lakes which receive the drainage of the northern slope of the Cypress Hills. The lake is shallow and alkaline. Its only source of water supply is Mackay Creek with its tributaries, Stony and Boxelder Creeks.

The topography of the basin is very rough, and the creek slopes are heavy. The basin is bare of trees except in the hills near the sources of the streams. The creek channels are deep, and the beds are mostly gravel.

As is the case in all prairie basins, the highest discharges occur in April. All the streams of this drainage basin stop running in June or July and generally remain so for the remainder of the season.

In the lower part of the drainage basin near the lake, irrigation has been developed to some extent in hay meadows. In the upper part there are few irrigation schemes.

### EAST BRANCH MACKAY CREEK AT GRANT'S RANCH.

*Location.*—On the NW. ¼ Sec. 36, Tp. 10, Rge. 1, W. 4th Mer., at Arthur Grant's ranch.

*Records available.*—From October 13, 1911, to October 31, 1915.

*Gauge.*—Vertical staff. The zero of the gauge was maintained at 75.65 feet during 1911; the zero of the gauge was maintained at 75.85 feet during 1912–15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Practically permanent.

*Discharge measurements.*—Made by wading or with a weir.

*Winter flow.*—Station discontinued during winter season.

*Remarks.*—Gauge height records were discontinued during 1915, as it was considered they were not of sufficient value to warrant the expense of maintenance.

PLATE 26

Mackay Creek in flood at Walsh, Alberta, on June 4, 1915. Taken by Miss H. E. Inkster.

PLATE 27

Mackay Creek in flood at Walsh, Alberta, on June 4, 1915. Taken by Miss H. E. Inkster.

DISCHARGE MEASUREMENTS of East Branch of Mackay Creek at Grant's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Oct. 13 | H. W. Rowley | ..... | ..... | ..... | 1.10 | Nil. |

WEST BRANCH MACKAY CREEK AT SCHNELL'S RANCH.

*Location.*—On the NE. ¼ Sec. 27, Tp. 10, Rge. 1, W. 4th Mer., at Chris. Schnell's ranch.
*Records available.*—From Sept. 20, 1912, to October 31, 1914.
*Gauge.*—Vertical staff. The zero of the gauge has been maintained at 91.66 feet, remaining unchanged since the station was established.
*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.
*Channel.*—Composed of loose stones and gravel liable to shift during flood stages.
*Discharge measurements.*—Made by wading or with a weir.
*Winter flow.*—Station discontinued during the winter season.
*Remarks.*—Gauge height records were discontinued during 1915, as it was considered they were not of sufficient value to warrant the expense of maintenance.

DISCHARGE MEASUREMENTS of West Branch of Mackay Creek at Schnell's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq.-ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Oct. 13 | H. W. Rowley | ..... | ..... | ..... | Dry. | Nil. |

MACKAY CREEK AT WALSH.

*Location.*—On the NW. ¼ Sec. 26, Tp. 11, Rge. 1, W. 4th Mer., at traffic bridge.
*Records available.*—July 29, 1909, to October 31, 1915.
*Gauge.*—Vertical staff. Elevation 2432.65 feet above mean sea level, maintained since establishment.
*Bench-mark.*—Permanent iron bench-mark. Elevation 2443.73 feet above mean sea level. (Geodetic Survey of Canada.)
*Channel.*—Composed of clay.
*Discharge measurements.*—Made from bridge, wading or with a weir.
*Floods.*—On June 4, 1915, this stream slightly overflowed its banks at the town of Walsh, but caused little damage. This rise was due to excessive rainfall during the last of May and the early part of June at the headwaters.
*Winter flow.*—Station not maintained during winter.
*Observer.*—Edward Sept.

DISCHARGE MEASUREMENTS of Mackay Creek at Walsh, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 17 | R. J. Srigley | 57.0 | 203.00 | 1.44 | 5.20 | 294.00 |
| April 2 | H. B. R. Thompson | 29.0 | 38.00 | 0.87 | 1.81 | 33.00 |
| April 8 | do | 17.0 | 32.45 | 0.91 | 1.72 | 29.00 |
| April 19 | do | 11.6 | 10.92 | 0.71 | 0.94 | 7.70 |
| May 3 | H. W. Rowley | ....*a* | ..... | ..... | 0.36 | 0.50 |
| June 6 | R. J. McGuinness | 60.0 | 245.50 | 1.42 | 5.65 | 347.00 |
| June 6 | do | ....*b* | 595.30 | ..... | 10.94 | ..... |
| June 11 | H. W. Rowley | 12.0 | 27.40 | 1.05 | 1.72 | 29.00 |
| July 2 | do | 6.0 | 5.40 | 0.46 | 0.66 | 2.50 |
| July 20 | H. B. R. Thompson | 11.0 | 18.27 | 0.50 | 0.97 | 9.20 |
| July 26 | H. W. Rowley | 8.0 | 8.60 | 1.09 | 1.05 | 9.40 |
| Aug. 24 | do | ....*a* | ..... | ..... | 0.56 | 1.27 |
| Sept. 15 | do | ....*a* | ..... | ..... | 0.32 | 0.16 |
| Oct. 13 | do | 8.0 | 7.70 | 0.48 | 0.74 | 3.70 |
| Nov. 1 | do | ....*a* | ..... | ..... | 0.57 | 1.66 |

*a* Weir measurement.
*b* Slope measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Mackay Creek at Walsh, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.55 | 24.00 | 0.44 | 0.70 | 0.60 | 1.90 |
| 2 | ..... | ..... | 1.97 | 38.00 | 0.40 | 0.50 | 0.68 | 2.80 |
| 3 | ..... | ..... | 3.90 | 158.00 | 0.35 | 0.35 | 1.78 | 32.00 |
| 4 | ..... | ..... | 4.24 | 189.00 | 0.30 | 0.20 | 8.84 | 1,009.00 |
| 5 | ..... | ..... | 2.62 | 68.00 | 0.24 | 0.11 | 7.44 | 663.00 |
| 6 | ..... | ..... | 2.06 | 42.00 | 0.22 | 0.08 | 5.79 | 369.00 |
| 7 | ..... | ..... | 1.80 | 32.00 | 0.30 | 0.20 | 3.38 | 118.00 |
| 8 | ..... | ..... | 1.73 | 30.00 | 0.28 | 0.17 | 2.61 | 68.00 |
| 9 | ..... | ..... | 1.62 | 26.00 | 0.24 | 0.11 | 2.10 | 44.00 |
| 10 | ..... | ..... | 1.36 | 18.70 | 0.17 | Nil. | 1.84 | 34.00 |
| 11 | ..... | ..... | 1.31 | 17.30 | 0.09 | " | 1.72 | 30.00 |
| 12 | ..... | ..... | 1.25 | 15.60 | 0.04 | " | 1.66 | 28.00 |
| 13 | ..... | ..... | 1.27 | 16.20 | 0.00 | " | 1.56 | 25.00 |
| 14 | ..... | ..... | 1.35 | 18.40 | 0.07 | " | 1.44 | 21.00 |
| 15 | ..... | ..... | 1.38 | 19.20 | 0.97 | 8.10 | 1.30 | 17.00 |
| 16 | 2.20 | 48.0 | 1.32 | 17.60 | 4.43 | 207.00 | 1.18 | 13.70 |
| 17 | 4.55 | 219.0 | 1.10 | 11.50 | 2.82 | 80.00 | 1.12 | 12.00 |
| 18 | 4.69 | 234.0 | 1.08 | 11.00 | 1.85 | 34.00 | 1.12 | 12.00 |
| 19 | 2.78 | 78.0 | 0.94 | 7.50 | 1.45 | 21.00 | 1.23 | 15.00 |
| 20 | 2.34 | 54.0 | 0.90 | 6.60 | 1.26 | 15.90 | 1.21 | 14.50 |
| 21 | 2.63 | 69.0 | 0.82 | 5.00 | 1.11 | 11.80 | 1.19 | 13.90 |
| 22 | 3.84 | 153.0 | 0.76 | 4.00 | 1.01 | 9.10 | 1.08 | 11.00 |
| 23 | 4.02 | 169.0 | 0.73 | 3.50 | 0.98 | 8.40 | 0.98 | 8.40 |
| 24 | 3.12 | 99.0 | 0.72 | 3.30 | 0.92 | 7.00 | 0.89 | 6.40 |
| 25 | 1.78 | 32.0 | 0.70 | 3.00 | 0.86 | 5.80 | 0.78 | 4.30 |
| 26 | 1.54 | 24.0 | 0.68 | 2.80 | 0.85 | 5.60 | 1.34 | 18.10 |
| 27 | 1.80 | 32.0 | 0.62 | 2.10 | 0.94 | 7.50 | 0.90 | 6.60 |
| 28 | 1.76 | 31.0 | 0.54 | 1.36 | 0.90 | 6.60 | 0.90 | 6.60 |
| 29 | 1.77 | 31.0 | 0.54 | 1.36 | 0.80 | 4.60 | 0.80 | 4.60 |
| 30 | 1.52 | 23.0 | 0.50 | 1.00 | 0.72 | 3.30 | 0.76 | 4.00 |
| 31 | 1.10 | 11.5 | ..... | ..... | 0.65 | 2.40 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Mackay Creek at Walsh, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 0.71 | 3.2 | 0.62 | 2.10 | 0.01 | Nil. | Dry. | Nil. |
| 2 | 0.65 | 2.4 | 0.56 | 1.54 | Dry. | " | " | " |
| 3 | 0.70 | 3.0 | 0.51 | 1.09 | " | " | " | " |
| 4 | 0.69 | 2.9 | 0.46 | 0.80 | " | " | 0.42 | 0.60 |
| 5 | 0.68 | 2.8 | 0.37 | 0.41 | 0.22 | 0.08 | 0.30 | 0.20 |
| 6 | 0.62 | 2.1 | 0.22 | 0.08 | 0.25 | 0.13 | 0.56 | 1.54 |
| 7 | 1.44 | 21.0 | 0.16 | Nil. | 0.18 | Nil. | 0.56 | 1.54 |
| 8 | 1.66 | 28.0 | 0.08 | " | 0.13 | " | 0.69 | 2.90 |
| 9 | 1.81 | 33.0 | 0.02 | " | 0.30 | 0.20 | 0.69 | 2.90 |
| 10 | 1.06 | 10.4 | Dry. | " | 0.23 | 0.09 | 0.66 | 2.60 |
| 11 | 0.84 | 5.4 | " | " | 0.17 | Nil. | 0.73 | 3.50 |
| 12 | 0.72 | 3.3 | " | " | 0.12 | " | 0.70 | 3.00 |
| 13 | 0.70 | 3.0 | " | " | 0.32 | 0.26 | 0.71 | 3.20 |
| 14 | 2.08 | 43.0 | " | " | 0.41 | 0.55 | 0.68 | 2.80 |
| 15 | 3.10 | 98.0 | " | " | 0.33 | 0.29 | 0.66 | 2.60 |
| 16 | 1.88 | 35.0 | " | " | 0.30 | 0.20 | 0.63 | 2.20 |
| 17 | 1.44 | 21.0 | 3.44 | 122.00 | 0.25 | 0.13 | 0.60 | 1.90 |
| 18 | 1.22 | 14.8 | 1.00 | 8.80 | 0.19 | Nil. | 0.58 | 1.72 |
| 19 | 1.10 | 11.5 | 0.74 | 3.60 | 0.18 | " | 0.58 | 1.72 |
| 20 | 0.97 | 8.1 | 0.56 | 1.54 | 0.43 | 0.65 | 0.57 | 1.63 |
| 21 | 0.85 | 5.6 | 0.50 | 1.00 | 0.29 | 0.18 | 0.52 | 1.18 |
| 22 | 0.78 | 4.3 | 1.00 | 8.80 | 0.23 | 0.09 | 0.51 | 1.09 |
| 23 | 0.72 | 3.3 | 0.72 | 3.30 | 0.18 | Nil. | 0.50 | 1.00 |
| 24 | 1.92 | 36.0 | 0.55 | 1.45 | 0.16 | " | 0.50 | 1.00 |
| 25 | 1.33 | 17.8 | 0.48 | 0.90 | 0.14 | " | 0.50 | 1.00 |
| 26 | 1.10 | 11.5 | 0.40 | 0.50 | 0.12 | " | 0.48 | 0.90 |
| 27 | 0.91 | 6.8 | 0.34 | 0.32 | 0.08 | " | 0.48 | 0.90 |
| 28 | 0.82 | 5.0 | 0.31 | 0.23 | 0.06 | " | 0.48 | 0.90 |
| 29 | 0.70 | 3.0 | 0.22 | 0.08 | 0.02 | " | 0.48 | 0.90 |
| 30 | 0.67 | 2.7 | 0.14 | Nil. | 0.05 | " | 0.48 | 0.90 |
| 31 | 0.66 | 2.6 | 0.05 | " | ..... | ..... | 0.48 | 0.90 |

MONTHLY DISCHARGE of Mackay Creek at Walsh, for 1915.

(Drainage area 200 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet |
| March (16-31) | 234.00 | 11.50 | 82.00 | 0.41000 | 0.2400 | 2,593 |
| April | 189.00 | 1.00 | 26.00 | 0.13000 | 0.1400 | 1,547 |
| May | 207.00 | 0.00 | 14.20 | 0.07100 | 0.0800 | 873 |
| June | 1,009.00 | 1.90 | 87.00 | 0.43500 | 0.4800 | 5,177 |
| July | 98.00 | 2.10 | 14.50 | 0.07250 | 0.0800 | 892 |
| August | 122.00 | 0.00 | 5.10 | 0.02550 | 0.0300 | 314 |
| September | 0.65 | 0.00 | 0.10 | 0.00048 | 0.0005 | 6 |
| October | 3.50 | 0.00 | 1.52 | 0.00760 | 0.0090 | 93 |
| The period | ..... | ..... | ..... | ..... | 1.0595 | 11,495 |

BOXELDER CREEK AT YOUNG'S RANCH.

*Location.*—On the NE. ¼ Sec. 2, Tp. 12, Rge. 30, W. 3rd Mer., two miles east of Walsh.
*Records available.*—March 11, 1911, October 31, 1915. Discharge measurements only 1909-10.
*Gauge.*—Vertical staff. Elevation of zero maintained at 88.83 feet since establishment.
*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.
*Channel.*—Clay.

*Discharge Measurements.*—Made by wading; during flood stages from railway bridge downstream.

*Winter flow.*—Station not maintained during the winter.

*Observer.*—John Young.

*Remarks.*—On October 14, the gauge rod at this station was moved two hundred feet downstream. There was no flow in the creek after the rod was moved.

DISCHARGE MEASUREMENTS of Boxelder Creek at Young's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 17 | R. J. Srigley | 38.00 | 91.40 | 0.79 | 4.30 | 72.00 |
| April 2 | H. B. R. Thompson | 11.90 | 8.80 | 0.53 | 1.70 | 4.70 |
| April 8 | do | 12.00 | 11.90 | 0.82 | 1.90 | 9.70 |
| April 19 | do | 9.00 | 3.71 | 0.25 | 1.34 | 0.94 |
| May 3 | H. W. Rowley | ..... | ..... | ..... | Dry. | Nil. |
| June 6 | R. J. McGuinness | 47.00 | 160.30 | 0.71 | 5.83 | 114.00 |
| June 6 | do | .....*a* | 234.60 | 0.96 | 7.27 | 225.00 |
| June 11 | H. W. Rowley | 10.00 | 7.60 | 0.46 | 1.63 | 3.50 |
| July 2 | do | ..... | ..... | ..... | Dry. | Nil. |
| July 20 | H. B. R. Thompson | ..... | ..... | ..... | 0.74 | " |
| July 27 | H. W. Rowley | 4.00 | 2.40 | 1.04 | 1.54 | 2.50 |
| Aug. 24 | do | ..... | ..... | ..... | Dry. | Nil. |
| Sept. 16 | do | ..... | ..... | ..... | " | " |
| Oct. 14 | do | ..... | ..... | ..... | " | " |
| Nov. 2 | do | ..... | ..... | ..... | " | " |

*a* Slope measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Boxelder Creek at Young's Ranch, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.65 | 3.8 | Dry. | Nil. | Dry. | Nil. |
| 2 | ..... | ..... | 1.90 | 8.5 | " | " | " | " |
| 3 | ..... | ..... | 3.20 | 40.0 | " | " | 3.75 | 55.00 |
| 4 | ..... | ..... | 3.95 | 60.0 | " | " | 5.00 | 89.00 |
| 5 | ..... | ..... | 3.60 | 51.0 | " | " | 6.90 | 165.00 |
| 6 | ..... | ..... | 2.65 | 26.0 | " | " | 6.02 | 121.00 |
| 7 | ..... | ..... | 1.95 | 9.6 | " | " | 4.05 | 63.00 |
| 8 | ..... | ..... | 1.90 | 8.5 | " | " | 2.15 | 14.20 |
| 9 | ..... | ..... | 1.90 | 8.5 | " | " | 1.92 | 8.90 |
| 10 | ..... | ..... | 1.75 | 5.5 | " | " | 1.70 | 4.50 |
| 11 | ..... | ..... | 1.70 | 4.5 | " | " | 1.62 | 3.50 |
| 12 | ..... | ..... | 1.60 | 3.2 | " | " | 1.50 | 2.00 |
| 13 | ..... | ..... | 1.60 | 3.2 | " | " | 1.50 | 2.00 |
| 14 | ..... | ..... | 1.60 | 3.2 | " | " | 1.48 | 1.80 |
| 15 | ..... | ..... | 1.60 | 3.2 | " | " | 1.40 | 1.00 |
| 16 | 3.95 | 60.0 | 1.50 | 2.0 | 1.10 | " | 1.38 | 0.88 |
| 17 | 4.45 | 74.0 | 1.50 | 2.0 | 3.25 | 41.0 | 1.28 | 0.36 |
| 18 | 5.85 | 115.0 | 1.50 | 2.0 | 2.25 | 16.5 | 1.20 | 0.20 |
| 19 | 3.70 | 53.0 | 1.50 | 2.0 | 1.50 | 2.0 | 1.20 | 0.20 |
| 20 | 2.85 | 31.0 | 1.50 | 2.0 | 1.30 | 0.4 | 1.22 | 0.24 |
| 21 | 2.85 | 31.0 | 1.48 | 1.8 | 1.25 | 0.3 | 1.30 | 0.40 |
| 22 | 3.15 | 39.0 | 1.40 | 1.0 | 1.20 | 0.2 | 1.25 | 0.30 |
| 23 | 3.20 | 40.0 | 0.95 | Nil. | 1.10 | Nil. | 1.10 | Nil. |
| 24 | 3.75 | 55.0 | 0.65 | " | 1.05 | " | 1.00 | " |
| 25 | 2.85 | 31.0 | 0.45 | " | 0.95 | " | 0.92 | " |
| 26 | 2.20 | 15.3 | 0.35 | " | 0.85 | " | 1.20 | 0.20 |
| 27 | 1.80 | 6.5 | 0.15 | " | 0.60 | " | 1.48 | 1.80 |
| 28 | 1.65 | 3.8 | Dry. | " | 0.50 | " | 1.20 | 0.20 |
| 29 | 1.60 | 3.2 | " | " | 0.40 | " | 0.85 | Nil. |
| 30 | 1.65 | 3.8 | " | " | Dry. | " | 0.50 | " |
| 31 | 1.48 | 1.8 | ..... | ..... | " | " | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Boxelder Creek at Young's Ranch, for 1915. —*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 0.40 | Nil. | 0.75 | Nil. | Dry. | Nil. | Dry. | Nil. |
| 2 | 0.38 | " | 0.42 | " | " | " | " | " |
| 3 | 0.30 | " | 0.30 | " | " | " | " | " |
| 4 | 0.15 | " | 0.15 | " | " | " | " | " |
| 5 | Dry. | " | Dry. | " | " | " | " | " |
| 6 | " | " | " | " | " | " | " | " |
| 7 | " | " | " | " | " | " | " | " |
| 8 | " | " | " | " | " | " | " | " |
| 9 | " | " | " | " | " | " | " | " |
| 10 | " | " | " | " | " | " | " | " |
| 11 | " | " | " | " | " | " | " | " |
| 12 | " | " | " | " | " | " | " | " |
| 13 | " | " | " | " | " | " | " | " |
| 14 | " | " | " | " | " | " | " | " |
| 15 | " | " | " | " | " | " | " | " |
| 16 | 1.75 | 5.50 | " | " | " | " | " | " |
| 17 | 1.65 | 3.80 | " | " | " | " | " | " |
| 18 | 1.25 | 0.30 | " | " | " | " | " | " |
| 19 | 1.20 | 0.20 | " | " | " | " | " | " |
| 20 | 1.05 | Nil. | " | " | " | " | " | " |
| 21 | 0.80 | " | " | " | " | " | " | " |
| 22 | 0.50 | " | " | " | " | " | " | " |
| 23 | 0.32 | " | " | " | " | " | " | " |
| 24 | 1.98 | 10.20 | " | " | " | " | " | " |
| 25 | 2.40 | 20.00 | " | " | " | " | " | " |
| 26 | 1.80 | 6.50 | " | " | " | " | " | " |
| 27 | 1.42 | 1.20 | " | " | " | " | " | " |
| 28 | 1.30 | 0.40 | " | " | " | " | " | " |
| 29 | 1.30 | 0.40 | " | " | " | " | " | " |
| 30 | 1.15 | 0.10 | " | " | " | " | " | " |
| 31 | 0.95 | Nil. | " | " | " | " | " | " |

MONTHLY DISCHARGE of Boxelder Creek at Young's Ranch, for 1915.

(Drainage area 104 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet |
| March (16-31) | 115.00 | 1.80 | 35.00 | 0.3380 | 0.20 | 1,117 |
| April | 60.00 | 0.00 | 8.40 | 0.0808 | 0.09 | 500 |
| May | 41.00 | 0.00 | 1.95 | 0.0188 | 0.02 | 120 |
| June | 165.00 | 0.00 | 17.80 | 0.0171 | 0.20 | 1,065 |
| July | 20.00 | 0.00 | 1.58 | 0.0152 | 0.02 | 97 |
| August | ..... | ..... | ..... | | ..... | Nil. |
| September | ..... | ..... | ..... | | ..... | " |
| October | ..... | ..... | ..... | | ..... | " |
| The period | ..... | ..... | ..... | | 0.53 | 2,899 |

## ROSS CREEK DRAINAGE BASIN.

*General Description.*

Ross Creek rises in Elkwater Lake, a small body of water covering an area of approximately two square miles, situated in Township 8, Range 3, West of the 3rd Meridian. The creek flows in a northerly direction as far as Irvine and then turns sharply to the westward and closely parallels the main line of the Canadian Pacific railway to Medicine Hat. Here it joins Sevenpersons River and the combined stream flows into the South Saskatchewan in Section 32, Township 12, Range 5, West of the 4th Meridian. The tributaries of Ross Creek are Bullshead Creek which joins it in Section 21, Township 12, Range 5, West of the 4th Meridian and Grosventre Creek joins it in Section 14, Township 11, Range 3, West of the 4th Meridian.

The topography of this basin is exceedingly rough and rolling, and almost totally devoid of tree growth. The one exception is a small area of the Forest Reserve just south of Elkwater Lake, which has a good stand of pine and spruce.

The Canadian Pacific railway takes the water supply for its tank at Irvine from Ross Creek and there are also several irrigation schemes taking their supply from this stream.

### ROSS CREEK AT KOENIG'S RANCH.

*Location.*—On the SE. ¼ Sec. 36, Tp. 9, Rge. 3, W. 4th Mer., at G. Koenig's ranch, one mile below the former station on Ross Creek at James Robinson's ranch.

*Records available.*—At the original station at Robinson's ranch, NW. ¼ Sec. 24, Tp. 9, Rge. 3, W. 4th Mer., from October 11, 1911, to May 6, 1914; at the new station established May 15, 1914, at Koenig's ranch, SE. ¼ Sec. 36, Tp. 9, Rge. 3, W. 4th Mer., from May 15 to October 31, 1914. No records obtained in 1915.

### MISS A. H. BROWN'S DITCH NEAR EAGLE BUTTE.

*Location.*—On the NW. ¼ Sec. 31, Tp. 8, Rge. 3, W. 4th Mer., about one-quarter mile downstream from dam.

*Records available.*—None. Station established too late in season to obtain records for 1915.

*Gauge.*—Vertical staff driven into the bed of the ditch near the left bank. Zero elevation maintained at 95.93 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark located on the left bank four feet from the gauge rod. Assumed elevation, 100.00 feet.

*Channel.*—Composed of gravel loam.

*Discharge measurements.*—Made with meter or weir.

*Observer.*—L. C. Brown.

*Remarks.*—This station was established October 14, 1915, by H. R. Carscallen.

### GROSVENTRE CREEK AT TOTHILL'S RANCH.

*Location.*—On the SE. ¼ Sec. 27, Tp. 9, Rge. 4, W. 4th Mer., at Alf. Tothill's ranch.

*Records available.*—October 10, 1911, to April 23, 1915.

*Gauge.*—Vertical staff. The zero of the gauge has been maintained at 82.89 feet since the station was established.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Practically permanent.

*Observer.*—Mrs. Kate Tothill.

*Remarks.*—Gauge height observations were discontinued April 23, 1915, as they were not considered of sufficient value to warrant the expense of maintenance.

DISCHARGE MEASUREMENTS of Grosventre Creek at Tothill's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| June 9 | H. W. Rowley | .....*a* | ..... | ..... | 0.62 | 0.76 |
| Oct. 9 | do | .....*a* | ..... | ..... | 0.53 | 0.20 |

*a* Weir measurement

DAILY GAUGE HEIGHT AND DISCHARGE of Grosventre Creek at Tothill's Ranch, for 1915.

| Day. | March. | | April. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.12 | 13.70 |
| 2 | ..... | ..... | 1.79 | 64.00 |
| 3 | ..... | ..... | 1.78 | 63.00 |
| 4 | ..... | ..... | 1.33 | 26.00 |
| 5 | ..... | ..... | 1.15 | 15.10 |
| 6 | ..... | ..... | 0.94 | 6.50 |
| 7 | ..... | ..... | 0.90 | 5.20 |
| 8 | ..... | ..... | 0.86 | 4.20 |
| 9 | ..... | ..... | 0.76 | 2.20 |
| 10 | ..... | ..... | 0.72 | 2.00 |
| 11 | ..... | ..... | 0.68 | 1.20 |
| 12 | ..... | ..... | 0.70 | 1.40 |
| 13 | 2.28 | 106.0*a* | 0.72 | 1.66 |
| 14 | 2.06 | 87.0 | 0.74 | 1.92 |
| 15 | 2.15 | 95.0 | 0.70 | 1.40 |
| 16 | 1.67 | 53.0 | 0.66 | 1.00 |
| 17 | 1.43 | 33.0 | 0.63 | 0.74 |
| 18 | 1.39 | 30.0 | 0.60 | 0.50 |
| 19 | 1.50 | 39.0 | 0.56 | 0.30 |
| 20 | 1.50 | 39.0 | 0.52 | 0.16 |
| 21 | 1.84 | 68.0 | 0.50 | 0.10 |
| 22 | 2.27 | 105.0 | 0.52 | 0.16 |
| 23 | 2.08 | 89.0 | 0.51 | 0.13 |
| 24 | 1.33 | 26.0 | .... *b* | |
| 25 | 1.22 | 19.0 | .... | |
| 26 | 1.04 | 10.1 | .... | |
| 27 | 0.90 | 5.2 | .... | |
| 28 | 1.00 | 8.5 | .... | |
| 29 | 0.98 | 7.8 | .... | |
| 30 | 0.89 | 4.9 | .... | |
| 31 | 0.99 | 8.2 | | |

*a* 1914 discharge curve used to obtain discharge for 1915.
*b* Station discontinued April 24.

MONTHLY DISCHARGE of Grosventre Creek at Tothill's Ranch, for 1915.

(Drainage area 39 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (13–31) | 106.00 | 0.00 | 27.00 | 0.693 | 0.80 | 1,660 |
| April (1–24) | 64.00 | 0.13 | 9.30 | 0.240 | 0.20 | 422 |
| The period | ..... | ..... | ..... | ..... | 1.00 | 2,082 |

ROSS CREEK AT IRVINE.

*Location.*—On the NW. ¼ Sec. 31, Tp. 11, Rge. 2, W. 4th Mer., at traffic bridge in town of Irvine, and about 400 yards below the Canadian Pacific Railway Company's dam.

*Records available.*—July 28, 1909, to October 31, 1914.

*Gauge.*—Staff. The elevation of the zero of the gauge, 2477.79 feet, has been unchanged since establishment.

*Bench-mark.*—Permanent iron bench-mark. Elevation, 2501.43 feet above mean sea level (Geodetic Survey.)

*Channel.*—Shifting.

*Discharge measurements.*—From traffic bridge, by wading or with weir.

*Winter flow.*—Observations discontinued during winter.

*Artificial control.*—Canadian Pacific Railway Company have a dam about 400 yards above station.

*Diversions.*—Canadian Pacific Railway Company pump water from creek above dam for their water tank at Irvine.

*Observer.*—H. J. Price.

DISCHARGE MEASUREMENTS of Ross Creek at Irvine, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 18 | R. J. Srigley | 44.5 | 164.0 | 1.81 | 6.94 | 297.00 |
| April 3 | H. B. R. Thompson | 41.0 | 150.0 | 1.75 | 6.20 | 262.00 |
| April 8 | do | 15.0 | 24.2 | 1.52 | 1.96 | 37.00 |
| April 20 | do | 12.0 | 8.4 | 0.76 | 1.13 | 6.40 |
| June 6 | R. J. McGuinness | 31.0 | 97.6 | 1.81 | 4.53 | 177.00 |
| July 1 | W. H. Snelson | 13.5 | 13.7 | 1.08 | 1.45 | 14.80 |
| July 1 | do | 13.5 | 13.6 | 1.19 | 1.45 | 16.10 |
| July 20 | H. B. R. Thompson | 10.0 | 12.5 | 0.80 | 1.24 | 10.00 |
| Aug. 24 | H. W. Rowley | .....*a* | ..... | ..... | 0.68 | 0.46 |
| Sept. 15 | do | ..... | ..... | ..... | 0.63 | Nil. |
| Nov. 1 | Whyte and Rowley | .....*a* | ..... | ..... | 0.80 | 0.95 |

*a* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Ross Creek at Irvine, for 1915.

| DAY. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 4.16 | 150.00 | 0.90 | 2.30 | 1.04 | 4.7 |
| 2 | ..... | ..... | 5.40 | 219.00 | 0.90 | 2.30 | 1.40 | 13.7 |
| 3 | ..... | ..... | 6.32 | 268.00 | 0.90 | 2.30 | 2.90 | 86.0 |
| 4 | ..... | ..... | 5.40 | 219.00 | 0.90 | 2.30 | 6.52 | 279.0 |
| 5 | ..... | ..... | 4.20 | 155.00 | 0.87 | 1.94 | 5.40 | 219.0 |
| 6 | ..... | ..... | 2.50 | 65.00 | 0.83 | 1.46 | 4.20 | 155.0 |
| 7 | ..... | ..... | 2.01 | 40.00 | 0.80 | 1.10 | 3.50 | 118.0 |
| 8 | ..... | ..... | 2.01 | 40.00 | 0.77 | 0.83 | 2.80 | 81.0 |
| 9 | ..... | ..... | 1.90 | 34.00 | 0.73 | 0.47 | 2.70 | 76.0 |
| 10 | ..... | ..... | 1.65 | 23.00 | 0.70 | 0.20 | 2.60 | 71.0 |
| 11 | 0.07 | Nil. | 1.52 | 17.80 | 0.69 | 0.18 | 2.50 | 65.0 |
| 12 | 0.84 | 1.58 | 1.46 | 15.90 | 0.69 | 0.18 | 2.00 | 39.0 |
| 13 | 1.64 | 23.00 | 1.40 | 13.70 | 1.01 | 4.10 | 1.80 | 29.0 |
| 14 | 2.29 | 54.00 | 1.40 | 13.70 | 1.95 | 36.00 | 1.60 | 21.0 |
| 15 | 4.29 | 160.00 | 1.40 | 13.70 | 2.90 | 86.00 | 1.40 | 13.7 |
| 16 | 5.94 | 248.00 | 1.36 | 12.50 | 3.25 | 105.00 | 2.00 | 39.0 |
| 17 | 6.41 | 273.00 | 1.34 | 12.00 | 2.90 | 86.00 | 2.10 | 44.0 |
| 18 | 7.14 | 312.00 | 1.27 | 9.80 | 1.90 | 34.00 | 2.00 | 39.0 |
| 19 | 5.05 | 200.00 | 1.25 | 9.50 | 1.70 | 25.00 | 2.00 | 39.0 |
| 20 | 3.14 | 99.00 | 1.13 | 6.60 | 1.50 | 17.00 | 1.50 | 17.0 |
| 21 | 3.04 | 94.00 | 1.03 | 4.50 | 1.39 | 13.40 | 1.30 | 10.8 |
| 22 | 6.13 | 259.00 | 1.02 | 4.30 | 1.37 | 12.80 | 1.30 | 10.8 |
| 23 | 6.58 | 282.00 | 1.00 | 3.90 | 1.36 | 12.50 | 1.30 | 10.8 |
| 24 | 5.14 | 205.00 | 0.98 | 3.60 | 1.33 | 11.70 | 1.30 | 10.8 |
| 25 | 3.05 | 94.00 | 0.97 | 3.40 | 1.33 | 11.70 | 1.28 | 10.3 |
| 26 | 2.06 | 42.00 | 0.95 | 3.10 | 1.30 | 10.80 | 1.28 | 10.3 |
| 27 | 1.74 | 27.00 | 0.95 | 3.10 | 1.30 | 10.80 | 1.26 | 9.8 |
| 28 | 1.94 | 36.00 | 0.95 | 3.10 | 1.04 | 4.70 | 1.22 | 8.7 |
| 29 | 2.04 | 41.00 | 0.93 | 2.80 | 1.02 | 4.30 | 1.18 | 7.8 |
| 30 | 2.10 | 44.00 | 0.90 | 2.30 | 1.00 | 3.90 | 1.14 | 6.8 |
| 31 | 2.13 | 46.00 | ..... | ..... | 1.02 | 4.30 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Ross Creek at Irvine, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.09 | 5.70 | 0.82 | 1.34 | 0.79 | 1.01 | 0.70 | 0.20 |
| 2 | 1.09 | 5.70 | 0.82 | 1.34 | 0.78 | 0.92 | 0.71 | 0.29 |
| 3 | 1.07 | 5.30 | 0.79 | 1.01 | 0.78 | 0.92 | 0.71 | 0.29 |
| 4 | 1.05 | 4.90 | 0.79 | 1.01 | 0.78 | 0.92 | 0.71 | 0.29 |
| 5 | 0.99 | 3.70 | 0.84 | 1.58 | 0.77 | 0.83 | 0.72 | 0.38 |
| 6 | 0.98 | 3.60 | 0.76 | 0.74 | 0.77 | 0.83 | 0.72 | 0.38 |
| 7 | 0.98 | 3.60 | 0.74 | 0.56 | 0.75 | 0.65 | 0.72 | 0.38 |
| 8 | 0.97 | 3.40 | 0.70 | 0.20 | 0.75 | 0.65 | 0.79 | 1.01 |
| 9 | 0.97 | 3.40 | 0.71 | 0.29 | 0.73 | 0.47 | 0.79 | 1.01 |
| 10 | 0.96 | 3.30 | 0.69 | 0.18 | 0.73 | 0.47 | 0.79 | 1.01 |
| 11 | 0.96 | 3.30 | 0.69 | 0.18 | 0.71 | 0.29 | 0.79 | 1.01 |
| 12 | 0.96 | 3.30 | 0.69 | 0.18 | 0.71 | 0.29 | 0.79 | 1.01 |
| 13 | 1.01 | 4.10 | 0.64 | 0.08 | 0.69 | 0.18 | 0.79 | 1.01 |
| 14 | 2.09 | 44.00 | 0.64 | 0.08 | 0.69 | 0.18 | 0.79 | 1.01 |
| 15 | 2.49 | 65.00 | 0.59 | Nil. | 0.69 | 0.18 | 0.79 | 1.01 |
| 16 | 3.29 | 107.00 | 0.59 | " | 0.69 | 0.18 | 0.79 | 1.01 |
| 17 | 3.24 | 104.00 | 2.03 | 40.00 | 0.69 | 0.18 | 0.79 | 1.01 |
| 18 | 3.09 | 96.00 | 2.07 | 43.00 | 0.69 | 0.18 | 0.79 | 1.01 |
| 19 | 1.99 | 38.00 | 1.99 | 38.00 | 0.69 | 0.18 | 0.79 | 1.01 |
| 20 | 1.49 | 16.70 | 1.59 | 21.00 | 0.69 | 0.18 | 0.79 | 1.01 |
| 21 | 1.24 | 9.20 | 2.97 | 90.00 | 0.69 | 0.18 | 0.79 | 1.01 |
| 22 | 1.19 | 8.00 | 2.39 | 60.00 | 0.69 | 0.18 | 0.79 | 1.01 |
| 23 | 1.19 | 8.00 | 1.97 | 38.00 | 0.69 | 0.18 | 0.79 | 1.01 |
| 24 | 1.14 | 6.80 | 1.58 | 20.00 | 0.69 | 0.18 | 0.79 | 1.01 |
| 25 | 1.09 | 5.70 | 0.89 | 2.10 | 0.69 | 0.18 | 0.79 | 1.01 |
| 26 | 1.09 | 5.70 | 0.84 | 1.58 | 0.69 | 0.18 | 0.79 | 1.01 |
| 27 | 0.99 | 3.70 | 0.81 | 1.22 | 0.69 | 0.18 | 0.79 | 1.01 |
| 28 | 0.94 | 2.90 | 0.81 | 1.22 | 0.69 | 0.18 | 0.79 | 1.01 |
| 29 | 0.89 | 2.10 | 0.81 | 1.22 | 0.69 | 0.18 | 0.79 | 1.01 |
| 30 | 0.89 | 2.10 | 0.81 | 1.22 | 0.69 | 0.18 | 0.79 | 1.01 |
| 31 | 0.84 | 1.58 | 0.81 | 1.22 | ..... | ..... | 0.79 | 1.01 |

MONTHLY DISCHARGE of Ross Creek at Irvine, for 1915.

(Drainage area 248 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (11–31) | 312.00 | Nil. | 121.00 | 0.48800 | 0.380 | 5,039 |
| April | 268.00 | 2.30 | 46.00 | 0.18500 | 0.210 | 2,737 |
| May | 105.00 | 0.18 | 16.40 | 0.06610 | 0.080 | 1,008 |
| June | 279.00 | 4.70 | 52.00 | 0.20900 | 0.230 | 3,094 |
| July | 107.00 | 1.58 | 18.70 | 0.07540 | 0.090 | 1,150 |
| August | 90.00 | 0.00 | 11.90 | 0.04800 | 0.060 | 732 |
| September | 1.01 | 0.18 | 0.38 | 0.00153 | 0.002 | 23 |
| October | 1.01 | 0.20 | 0.84 | 0.00338 | 0.004 | 52 |
| The period | ..... | ..... | ..... | ..... | 1.056 | 13,835 |

### MRS. M. A. CLARK DITCH FROM BULLSHEAD CREEK.

*Location.*—On the SE. ¼ Sec. 15, Tp. 9, Rge. 5, W. 4th Mer., 500 feet downstream from dam and intake of ditch.

*Gauge.*—Vertical staff fastened to post driven into bed of ditch near right bank. Elevation of zero maintained at 96.57 feet.

*Bench-mark.*—Top of iron post near gauge on right bank. Assumed elevation, 100.00 feet.

*Channel.*—Composed of gumbo.

*Discharge measurements.*—Made with meter or with a weir.

*Observer.*—Mr. W. Clark.

*Remarks.*—This station was established October 15, 1915, by H. R. Carscallen. No records are available for 1915.

### BULLSHEAD CREEK AT CLARK'S RANCH.

*Location.*—On the NW. ¼ Sec. 15, Tp. 9, Rge. 5, W. 4th Mer., at Clark's ranch.

*Records available.*—October 9, 1911, to May 16, 1915. Station discontinued May 16, 1915.

*Gauge.*—Vertical staff. The zero of the gauge has been maintained at 88.45 feet since the station was established.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Practically permanent.

*Winter flow.*—Station discontinued during winter season.

*Diversions.*—Water is diverted by Clark Brothers, above this station, for irrigation purposes.

*Observer.*—W. E. Clark.

*Remarks.*—A station was established at Johnston's ranch about fifteen miles below this station as it was considered more valuable records could be obtained at that point.

Discharge Measurements of Bullshead Creek at Clark's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 23 | R. J. Srigley | 53.0 | 54.0 | 2.39 | 2.85 | 129.00 |
| April 6 | H. B. R. Thompson | 19.7 | 26.0 | 0.55 | 1.60 | 14.20 |
| May 13 | H. W. Rowley | ....*a* | ..... | ..... | 1.02 | 0.62 |
| May 15 | do | 20.5 | 23.8 | 0.55 | 1.52 | 12.00 |
| Aug. 21 | do | ..... | ..... | ..... | 0.86 | Nil. |
| Sept. 13 | do | ....*a* | ..... | ..... | 1.05 | 0.69 |
| Oct. 9 | do | ..... | ..... | ..... | 1.01 | Nil.*b* |

*a* Weir measurement.
*b* Seeping from pool to pool.

DAILY GAUGE HEIGHT AND DISCHARGE of Bullshead Creek at Clark's Ranch, for 1915.

| Day. | March. | | April. | | May. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.05 | 41.00 | 0.98 | 0.56 |
| 2 | ..... | ..... | 2.98 | 148.00 | 1.05 | 1.10 |
| 3 | ..... | ..... | 3.45 | 223.00 | 1.05 | 1.10 |
| 4 | ..... | ..... | 2.20 | 53.00 | 1.05 | 1.10 |
| 5 | ..... | ..... | 1.85 | 28.00 | 1.05 | 1.10 |
| 6 | ..... | ..... | 1.64 | 17.00 | 1.05 | 1.10 |
| 7 | ..... | ..... | 1.58 | 14.20 | 1.05 | 1.10 |
| 8 | ..... | ..... | 1.52 | 11.80 | 1.04 | 1.00 |
| 9 | ..... | ..... | 1.46 | 9.80 | 1.02 | 0.80 |
| 10 | ..... | ..... | 1.45 | 9.50 | 1.00 | 0.60 |
| 11 | ..... | ..... | 1.40 | 8.00 | 1.00 | 0.60 |
| 12 | ..... | ..... | 1.35 | 6.50 | 1.00 | 0.60 |
| 13 | 0.39 | Nil. | 1.35 | 6.50 | 1.02 | 0.80 |
| 14 | 0.41 | " | 1.42 | 8.60 | 1.15 | 2.30 |
| 15 | 0.60 | " | 1.30 | 5.00 | 1.42 | 8.60 |
| 16 | 0.70 | " | 1.28 | 4.60 | 1.32 | 5.60*a* |
| 17 | 0.81 | " | 1.28 | 4.60 | ..... | ..... |
| 18 | 1.08 | 1.40 | 1.26 | 4.20 | ..... | ..... |
| 19 | 1.36 | 6.80 | 1.20 | 3.00 | ..... | ..... |
| 20 | 2.08 | 43.00 | 1.15 | 2.30 | ..... | ..... |
| 21 | 2.63 | 100.00 | 1.15 | 2.30 | ..... | ..... |
| 22 | 3.03 | 155.00 | 1.14 | 2.20 | ..... | ..... |
| 23 | 2.82 | 125.00 | 1.14 | 2.20 | ..... | ..... |
| 24 | 2.18 | 51.00 | 1.12 | 1.88 | ..... | ..... |
| 25 | 1.98 | 36.00 | 1.10 | 1.60 | ..... | ..... |
| 26 | 1.97 | 35.00 | 1.09 | 1.50 | ..... | ..... |
| 27 | 1.75 | 22.00 | 1.06 | 1.20 | ..... | ..... |
| 28 | 1.90 | 31.00 | 1.05 | 1.10 | ..... | ..... |
| 29 | 1.98 | 36.00 | 1.05 | 1.10 | ..... | ..... |
| 30 | 1.68 | 19.00 | 1.03 | 0.90 | ..... | ..... |
| 31 | 1.77 | 24.00 | ..... | ..... | ..... | ..... |

*a* Station discontinued.

MONTHLY DISCHARGE of Bullshead Creek at Clark's Ranch, for 1915.

(Drainage area 56 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (13-31) | 155.00 | 0.00 | 22.00 | 0.3950 | 0.46 | 1.353 |
| April | 223.00 | 0.90 | 21.00 | 0.3720 | 0.42 | 1.250 |
| May (1-16) | 8.60 | 0.56 | 1.75 | 0.0312 | 0.02 | 56 |
| The period | ..... | ..... | ..... | ..... | 0.90 | 2.659 |

BULLSHEAD CREEK AT JOHNSTON'S RANCH.

*Location.*—On the SW. ¼ Sec. 4, Tp. 11, Rge. 5, W. 4th Mer., at J. A. Johnston's ranch. This station was established May 15, 1915, and the former station at Clark's ranch was discontinued May 16, 1915.

*Records available.*—May 15, 1915, to October 31, 1915.

*Gauge.*—Vertical staff. The zero has been maintained at 94.31 feet.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Practically permanent.

*Winter flow.*—Station discontinued during winter season.

*Observer.*—J. A. Johnston.

DISCHARGE MEASUREMENTS of Bullshead Creek at Johnston's Ranch, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| May 15 | H. W. Rowley | 26.0 | 17.3 | 0.71 | 1.50 | 12.30 |
| June 10 | do | 10.0 | 6.6 | 0.75 | 1.36 | 5.00 |
| June 30 | do | .....*a* | ..... | ..... | 1.20 | 1.02 |
| July 23 | do | 49.0 | 36.8 | 1.30 | 1.84 | 48.00 |
| Aug. 21 | do | ..... | ..... | ..... | 0.97 | Nil. |
| Sept. 14 | do | ..... | ..... | ..... | 0.98 | " |
| Oct. 11 | do | ..... | ..... | ..... | 0.98 | " |
| Oct. 31 | do | ..... | ..... | ..... | 0.97 | " |

*a* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Bullshead Creek at Johnston's Ranch, for 1915.

| Day. | May. | | June. | | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 1.00 | 0.10 | 1.20 | 1.10 | 1.28 | 2.60 | 0.97 | Nil. | 0.97 | Nil. |
| 2 | ..... | ..... | 1.45 | 9.10 | 1.20 | 1.10 | 1.23 | 1.58 | 0.97 | " | 0.98 | " |
| 3 | ..... | ..... | 1.64 | 23.00 | 1.18 | 0.90 | 1.23 | 1.58 | 0.97 | " | 0.98 | " |
| 4 | ..... | ..... | 1.70 | 29.00 | 1.15 | 0.60 | 1.15 | 0.60 | 0.97 | " | 0.98 | " |
| 5 | ..... | ..... | 1.78 | 39.00 | 1.09 | 0.32 | 1.11 | 0.40 | 0.96 | " | 0.97 | " |
| 6 | ..... | ..... | 2.20 | 114.00 | 1.08 | 0.29 | 1.09 | 0.32 | 0.96 | " | 0.97 | " |
| 7 | ..... | ..... | 2.00 | 74.60 | 1.80 | 42.00 | 1.03 | 0.16 | 0.97 | " | 0.97 | " |
| 8 | ..... | ..... | 1.80 | 42.00 | 1.85 | 49.00 | .....*a* | Nil. | 0.98 | " | 0.98 | " |
| 9 | ..... | ..... | 1.38 | 5.80 | 1.51 | 13.00 | " | " | 0.98 | " | 0.98 | " |
| 10 | ..... | ..... | 1.36 | 5.00 | 1.42 | 7.60 | " | " | 0.98 | " | 0.98 | " |
| 11 | ..... | ..... | 1.36 | 5.00 | 1.38 | 5.80 | " | " | 0.98 | " | 0.98 | " |
| 12 | ..... | ..... | 1.36 | 5.00 | 1.36 | 5.00 | " | " | 0.98 | " | 0.98 | " |
| 13 | ..... | ..... | 1.34 | 4.30 | 1.33 | 4.00 | " | " | 0.98 | " | 0.98 | " |
| 14 | 1.25 | 1.90 | 1.33 | 4.00 | 1.54 | 15.10 | " | " | 0.98 | " | 0.98 | " |
| 15 | 1.50 | 12.30 | 1.33 | 4.00 | 1.99 | 72.00 | " | " | 0.98 | " | 0.98 | " |
| 16 | 1.43 | 8.10 | 1.29 | 2.80 | 2.16 | 106.00 | " | " | 0.98 | " | 0.98 | " |
| 17 | 1.40 | 6.60 | 1.29 | 2.80 | 1.79 | 41.00 | " | " | 0.97 | " | 0.98 | " |
| 18 | 1.34 | 4.30 | 1.27 | 2.30 | 1.73 | 33.00 | " | " | 0.97 | " | 0.98 | " |
| 19 | 1.34 | 4.30 | 1.27 | 2.30 | 1.50 | 12.30 | " | " | 0.98 | " | 0.98 | " |
| 20 | 1.34 | 4.30 | 1.25 | 1.90 | 1.43 | 8.10 | " | " | 0.98 | " | 0.98 | " |
| 21 | 1.32 | 3.60 | 1.25 | 1.90 | 1.40 | 6.60 | 0.97 | " | 0.98 | " | 0.98 | " |
| 22 | 1.32 | 3.60 | 1.24 | 1.74 | 1.22 | 1.42 | 0.97 | " | 0.97 | " | 0.98 | " |
| 23 | 1.28 | 2.60 | 1.22 | 1.42 | 1.77 | 38.60 | 0.97 | " | 0.96 | " | 0.98 | " |
| 24 | 1.25 | 1.90 | 1.21 | 1.26 | 1.83 | 46.00 | 0.97 | " | 0.96 | " | 0.97 | " |
| 25 | 1.25 | 1.90 | 1.17 | 0.80 | 1.69 | 28.00 | 0.97 | " | 0.96 | " | 0.97 | " |
| 26 | 1.22 | 1.42 | 1.23 | 1.58 | 1.67 | 26.00 | 0.97 | " | 0.96 | " | 0.97 | " |
| 27 | 1.21 | 1.26 | 1.25 | 1.90 | 1.61 | 21.00 | 0.97 | " | 0.97 | " | 0.97 | " |
| 28 | 1.20 | 1.10 | 1.30 | 3.00 | 1.57 | 17.40 | 0.97 | " | 0.97 | " | 0.98 | " |
| 29 | 1.20 | 1.10 | 1.25 | 1.90 | 1.50 | 12.30 | 0.97 | " | 0.97 | " | 0.98 | " |
| 30 | 1.00 | 0.10 | 1.21 | 1.26 | 1.46 | 9.70 | 0.97 | " | 0.97 | " | 0.98 | " |
| 31 | 1.00 | 0.10 | ..... | ..... | 1.35 | 4.60 | 0.97 | " | ..... | ..... | 0.98 | " |

*a* Water standing in pools.

MONTHLY DISCHARGE of Bullshead Creek at Johnston's Ranch, for 1915.

(Drainage area 134 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| May (14-31) | 12.30 | 0.10 | 3.40 | 0.02540 | 0.020 | 120 |
| June | 114.00 | 0.10 | 13.10 | 0.09780 | 0.110 | 780 |
| July | 106.00 | 0.29 | 20.00 | 0.15200 | 0.180 | 1,248 |
| August | 2.60 | 0.00 | 0.23 | 0.00172 | 0.002 | 14 |
| September | ..... | ..... | ..... | ..... | ..... | Nil. |
| October | ..... | ..... | ..... | ..... | ..... | Nil. |
| The period | ..... | ..... | ..... | ..... | 0.312 | 2,162 |

STARK AND BURTON DITCH FROM BULLSHEAD CREEK.

*Location.*—On the SE. ¼ Sec. 17, Tp. 11, Rge. 5, W. 4th Mer., at Stark and Burton's ranch, near Medicine Hat.

*Records available.*—Estimates are available for the years of 1912-14, complete records for 1915.

*Gauge.*—Vertical staff. The zero of the gauge has been maintained at 94.58 feet, since establishment.

*Bench-mark.*—Permanent iron bench-mark established twenty-nine feet SW. from gauge rod. Assumed elevation, 100.00 feet.

*Channel.*—Composed of sand and gravel.

*Discharge measurements.*—Made by wading with a meter.

*Control.*—On September 14, 1915, a permanent seven-foot sharp crested rectangular weir was installed twenty-five feet below the gauge rod. The elevation of the crest is maintained at 95.39 feet.

*Observer.*—R. E. Stark.

DISCHARGE MEASUREMENTS of Stark and Burton Ditch from Bullshead Creek, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| April 21 | H. R. Carscallen | 6.4 | 2.88 | 0.94 | 0.66 | 2.70 |
| May 15 | H. W. Rowley | 9.0 | 4.70 | 2.11 | 0.99 | 9.90 |
| June 10 | do | 9.0 | 3.80 | 1.24 | 0.80 | 4.80 |
| June 30 | do | 6.0 | 2.00 | 0.67 | 0.62 | 1.34 |
| July 24 | do | ..... | ..... | ..... | 0.45 | Nil |
| Aug. 21 | do | .. | .. | .. | Dry. | " |
| Sept. 14 | do | . | . | | " | " |
| Oct. 11 | do | | | | " | " |
| Oct. 31 | do | | | | " | " |

DAILY GAUGE HEIGHT AND DISCHARGE of Stark and Burton Ditch from Bullshead Creek, for 1915.

| Day. | April. | | May. | | June. | |
|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | Dry. | Nil. | 0.85 | 6.10 |
| 2 | ..... | ..... | " | " | 0.85 | 6.10 |
| 3 | ..... | ..... | " | " | 0.75 | 3.70 |
| 4 | ..... | ..... | " | " | 0.75 | 3.70 |
| 5 | 0.65 | 1.85 | " | " | 0.65 | 1.85 |
| 6 | 0.85 | 6.10 | " | " | 0.45 | Nil. |
| 7 | 0.85 | 6.10 | " | " | 0.65 | 1.85 |
| 8 | 1.05 | 12.00 | " | " | 0.85 | 6.10 |
| 9 | 1.25 | 19.50 | " | " | 0.85 | 6.10 |
| 10 | 1.20 | 17.60 | " | " | 0.85 | 6.10 |
| 11 | 1.60 | 33.00 | " | " | .....a | ..... |
| 12 | 1.25 | 19.50 | " | " | ..... | ..... |
| 13 | 1.05 | 12.00 | " | " | ..... | ..... |
| 14 | 1.20 | 17.60 | " | " | ..... | ..... |
| 15 | 0.85 | 6.10 | 1.05 | 12.00 | ..... | ..... |
| 16 | 0.85 | 6.10 | 0.65 | 1.85 | ..... | ..... |
| 17 | 0.75 | 3.70 | 0.65 | 1.85 | ..... | ..... |
| 18 | 0.75 | 3.70 | 0.45 | Nil. | ..... | ..... |
| 19 | 0.75 | 3.70 | 0.35 | " | ..... | ..... |
| 20 | 0.75 | 3.70 | 0.65 | 1.85 | ..... | ..... |
| 21 | 0.65 | 1.85 | 0.65 | 1.85 | ..... | ..... |
| 22 | 0.65 | 1.85 | 0.65 | 1.85 | ..... | ..... |
| 23 | 0.65 | 1.85 | 0.25 | Nil. | ..... | ..... |
| 24 | 0.65 | 1.85 | Dry. | " | ..... | ..... |
| 25 | 0.55 | 0.68 | " | " | ..... | ..... |
| 26 | 0.55 | 0.68 | " | " | ..... | ..... |
| 27 | 0.45 | Nil. | " | " | ..... | ..... |
| 28 | 0.45 | " | " | " | ..... | ..... |
| 29 | Dry. | " | " | " | ..... | ..... |
| 30 | " | " | " | " | ..... | ..... |
| 31 | ..... | ..... | " | " | ..... | ..... |

*a* Not using water.

MONTHLY DISCHARGE of Stark and Burton Ditch from Bullshead Creek, for 1915.

| Month | Discharge in Second-Feet. | | | Total discharge in Acre-feet. |
|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | |
| April (5-30) | 33.0 | Nil. | 7.00 | 359 |
| May | 12.0 | " | 0.68 | 42 |
| June (1-10) | 6.1 | " | 4.20 | 83 |
| The period | ..... | ..... | ..... | 484 |

BULLSHEAD CREEK NEAR DUNMORE.

*Location.*—On the SW. ¼ Sec. 16, Tp. 12, Rge. 5, W. 4th Mer., at the traffic bridge about four miles east of Medicine Hat and about one mile above the junction of Ross and Bullshead creeks.

*Records available.*—July 26, 1909, to October 31, 1915.

*Gauge.*—Staff. Elevation of zero of gauge 2295.65 feet during 1909–11; elevation of zero of gauge 2295.01 feet during 1912; elevation of zero of gauge 2295.06 feet during 1913–15.

*Bench-mark.*—Permanent iron bench-mark. Elevation 2305.53 feet above mean sea level. (Geodetic Survey.)

*Channel.*—Shifting.

*Discharge measurements.*—From bridge, by wading or with weir.

*Gauge heights.*—Owing to it being impossible to obtain an observer, no records were obtained during 1915.

*Winter flow.*—Observations discontinued during winter.

DISCHARGE MEASUREMENTS of Bullshead Creek near Dunmore, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 20 | R. J. Srigley | 33.0 | 25.00 | 1.34 | 2.18 | 33.00 |
| Mar. 24 | do | 39.0 | 58.60 | 1.67 | 2.65 | 98.00 |
| April 5 | H. B. R. Thompson | 38.5 | 54.27 | 1.69 | 2.51 | 92.00 |
| June 1 | R. J. McGuinness | 5.6 | 1.01 | 0.48 | 1.25 | 0.48 |
| June 8 | do | 28.4 | 13.30 | 0.94 | 1.78 | 12.60 |
| July 17 | H. B. R. Thompson | 26.0 | 11.20 | 1.26 | 1.83 | 14.20 |
| Aug. 25 | do | 2.4 | 0.62 | 0.20 | 1.10 | 0.12 |
| Sept. 22 | do | 5.0 | 0.74 | 0.39 | 1.14 | 0.29 |
| Oct. 18 | do | 6.0 | 0.64 | 0.45 | 1.14 | 0.29 |

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Ross Creek drainage basin, in 1915.

| Date. | Engineer. | Stream. | Location. | Width. | Area of Section. | Mean Velocity. | Discharge. |
|---|---|---|---|---|---|---|---|
| | | | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Sec.-ft.* |
| Oct. 13 | H. W. Rowley | Ross Creek | NE. 24-9-3-4 | 10 | 6.10 | 0.67 | 4.10 |

## SEVENPERSONS RIVER DRAINAGE BASIN.

### *General Description.*

Sevenpersons River lies between the South Saskatchewan River and the Cypress Hills and empties into the South Saskatchewan River at Medicine Hat. The drainage area consists mostly of open, level prairie, which has a small rainfall and a run-off confined chiefly to the spring freshet.

The creek has a considerable flow during the month of April, but the discharge decreases to nil about June.

There are no irrigation works of importance on this stream, and the records are valuable chiefly for statistical purposes.

#### SEVENPERSONS RIVER AT MEDICINE HAT.

*Location.*—On the NE. ¼ Sec. 30, Tp. 12, Rge. 5, W. 4th Mer., at the bridge on the road between Medicine Hat and Dunmore and about one and one-half miles east of the Canadian Pacific Railway station at Medicine Hat.

*Records available.*—April 27, 1910, to October 31, 1915.

*Gauge.*—Vertical staff. Elevation of zero maintained at 86.68 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Shifting.

*Discharge measurements.*—From bridge, by wading or with weir.

*Winter flow.*—Observations discontinued during the winter.

*Observer.*—J. W. Pickering.

DISCHARGE MEASUREMENTS of Sevenpersons River near Medicine Hat, in 1915

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 20 | R. J. Srigley | 5.0 | 2.50 | 1.74 | 2.72 | 4.40 |
| Mar. 24 | do | 47.0 | 73.50 | 4.70 | 3.82 | 345.00 |
| April 5 | H. B. R. Thompson | 43.5 | 107.57 | 3.68 | 3.91 | 397.00 |
| June 1 | R. J. McGuinness | 3.9 | 0.70 | 0.99 | 1.44 | 0.70 |
| June 8 | do | 17.5 | 10.54 | 1.19 | 1.82 | 12.60 |
| July 17 | H. B. R. Thompson | 5.0 | 1.40 | 0.26 | 1.35 | 0.36 |
| Aug. 25 | do | 4.0 | 0.90 | 0.17 | 1.22 | 0.15 |
| Sept. 22 | do | 5.0 | 1.90 | 0.29 | 1.33 | 0.54 |
| Oct. 18 | do | 4.5 | 1.64 | 0.21 | 1.28 | 0.34 |

DAILY GAUGE HEIGHT AND DISCHARGE of Sevenpersons River near Medicine Hat, for 1915.

| Day. | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 2.54 | 65.0 | 1.62 | 3.90 | 1.35 | 0.33 |
| 2 | ..... | ..... | 2.64 | 76.0 | 1.66 | 5.40 | 1.45 | 0.77 |
| 3 | ..... | ..... | 2.92 | 112.0 | 1.62 | 3.90 | 1.61 | 3.60 |
| 4 | ..... | ..... | 4.00 | 450.0 | 1.65 | 5.00 | 1.75 | 9.00 |
| 5 | ..... | ..... | 4.00 | 450.0 | 1.65 | 5.00 | 1.93 | 17.50 |
| 6 | ..... | ..... | 3.93 | 406.0 | 1.67 | 5.70 | 1.91 | 16.50 |
| 7 | ..... | ..... | 3.04 | 132.0 | 1.70 | 6.80 | 1.82 | 12.20 |
| 8 | ..... | ..... | 2.92 | 112.0 | 1.66 | 5.40 | 1.77 | 9.90 |
| 9 | ..... | ..... | 2.85 | 102.0 | 1.60 | 3.20 | 1.63 | 4.30 |
| 10 | ..... | ..... | 2.59 | 71.0 | 1.57 | 2.60 | 1.59 | 3.00 |
| 11 | ..... | ..... | 2.52 | 63.0 | 1.53 | 1.73 | 1.55 | 2.20 |
| 12 | ..... | ..... | 2.42 | 53.0 | 1.50 | 1.10 | 1.50 | 1.10 |
| 13 | ..... | ..... | 2.22 | 37.0 | 1.55 | 2.20 | 1.49 | 1.03 |
| 14 | ..... | ..... | 2.15 | 32.0 | 1.62 | 3.90 | 1.46 | 0.84 |
| 15 | ..... | ..... | 2.12 | 29.0 | 1.73 | 8.10 | 1.44 | 0.70 |
| 16 | ..... | ..... | 1.98 | 20.0 | 1.80 | 11.20 | 1.42 | 0.57 |
| 17 | ..... | ..... | 1.86 | 14.1 | 1.82 | 12.20 | 1.42 | 0.57 |
| 18 | ..... | ..... | 1.78 | 10.3 | 1.71 | 7.20 | 1.40 | 0.44 |
| 19 | ..... | ..... | 1.72 | 7.7 | 1.72 | 7.70 | 1.40 | 0.44 |
| 20 | ..... | ..... | 1.69 | 6.4 | 1.66 | 5.40 | 1.51 | 1.31 |
| 21 | ..... | ..... | 1.70 | 6.8 | 1.62 | 3.90 | 1.54 | 1.94 |
| 22 | ..... | ..... | 1.68 | 6.1 | 1.56 | 2.40 | 1.61 | 3.60 |
| 23 | ..... | ..... | 1.69 | 6.4 | 1.51 | 1.31 | 1.63 | 4.30 |
| 24 | ..... | ..... | 1.70 | 6.8 | 1.46 | 0.84 | 1.65 | 5.00 |
| 25 | ..... | ..... | 1.71 | 7.2 | 1.40 | 0.44 | 1.68 | 6.10 |
| 26 | ..... | ..... | 1.64 | 4.6 | 1.34 | 0.30 | 1.70 | 6.80 |
| 27 | ..... | ..... | 1.60 | 3.2 | 1.29 | 0.20 | 1.68 | 6.10 |
| 28 | 3.32 | 184 | 1.62 | 3.9 | 1.27 | 0.19 | 1.65 | 5.00 |
| 29 | 2.92 | 112 | 1.64 | 4.6 | 1.24 | 0.17 | 1.61 | 3.60 |
| 30 | 2.52 | 63 | 1.60 | 3.2 | 1.27 | 0.19 | 1.59 | 3.00 |
| 31 | 2.57 | 69 | ..... | ..... | 1.30 | 0.21 | ..... | ..... |

DAILY GAUGE HEIGHT AND DISCHARGE of Sevenpersons River near Medicine Hat, for 1915.
—*Concluded.*

| Day. | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.54 | 1.94 | 1.58 | 2.80 | 1.12 | 0.09 | 1.38 | 0.39 |
| 2 | 1.50 | 1.10 | 1.52 | 1.52 | 1.19 | 0.13 | 1.43 | 0.64 |
| 3 | 1.48 | 0.97 | 1.49 | 1.03 | 1.28 | 0.20 | 1.45 | 0.77 |
| 4 | 1.45 | 0.77 | 1.46 | 0.84 | 1.33 | 0.28 | 1.47 | 0.90 |
| 5 | 1.40 | 0.44 | 1.43 | 0.64 | 1.36 | 0.35 | 1.48 | 0.97 |
| 6 | 1.36 | 0.35 | 1.41 | 0.51 | 1.37 | 0.37 | 1.49 | 1.03 |
| 7 | 1.31 | 0.23 | 1.36 | 0.35 | 1.39 | 0.42 | 1.48 | 0.97 |
| 8 | 1.25 | 0.18 | 1.35 | 0.33 | 1.42 | 0.57 | 1.48 | 0.97 |
| 9 | 1.15 | 0.11 | 1.36 | 0.35 | 1.40 | 0.44 | 1.49 | 1.03 |
| 10 | 1.10 | 0.08 | 1.36 | 0.35 | 1.42 | 0.57 | 1.48 | 0.97 |
| 11 | 1.12 | 0.09 | 1.39 | 0.42 | 1.44 | 0.70 | 1.47 | 0.90 |
| 12 | 1.18 | 0.13 | 1.41 | 0.51 | 1.45 | 0.77 | 1.46 | 0.84 |
| 13 | 1.22 | 0.15 | 1.43 | 0.64 | 1.46 | 0.84 | 1.45 | 0.77 |
| 14 | 1.31 | 0.23 | 1.45 | 0.77 | 1.48 | 0.97 | 1.43 | 0.64 |
| 15 | 1.36 | 0.35 | 1.44 | 0.70 | 1.50 | 1.10 | 1.41 | 0.51 |
| 16 | 1.41 | 0.51 | 1.41 | 0.51 | 1.51 | 1.31 | 1.39 | 0.42 |
| 17 | 1.46 | 0.84 | 1.39 | 0.42 | 1.52 | 1.52 | 1.39 | 0.42 |
| 18 | 1.46 | 0.84 | 1.37 | 0.37 | 1.52 | 1.52 | 1.42 | 0.57 |
| 19 | 1.44 | 0.70 | 1.36 | 0.35 | 1.47 | 0.90 | 1.43 | 0.64 |
| 20 | 1.43 | 0.64 | 1.34 | 0.30 | 1.42 | 0.57 | 1.45 | 0.77 |
| 21 | 1.41 | 0.51 | 1.31 | 0.23 | 1.37 | 0.37 | 1.47 | 0.90 |
| 22 | 1.41 | 0.51 | 1.29 | 0.20 | 1.35 | 0.33 | 1.47 | 0.90 |
| 23 | 1.43 | 0.64 | 1.24 | 0.17 | 1.33 | 0.28 | 1.48 | 0.97 |
| 24 | 1.45 | 0.77 | 1.19 | 0.13 | 1.33 | 0.28 | 1.46 | 0.84 |
| 25 | 1.49 | 1.03 | 1.17 | 0.12 | 1.34 | 0.30 | 1.48 | 0.97 |
| 26 | 1.53 | 1.73 | 1.12 | 0.09 | 1.34 | 0.30 | 1.47 | 0.90 |
| 27 | 1.57 | 2.60 | 1.10 | 0.08 | 1.33 | 0.28 | 1.46 | 0.84 |
| 28 | 1.63 | 4.30 | 1.07 | 0.06 | 1.35 | 0.33 | 1.47 | 0.90 |
| 29 | 1.64 | 4.60 | 1.07 | 0.06 | 1.34 | 0.30 | 1.48 | 0.97 |
| 30 | 1.63 | 4.30 | 1.09 | 0.07 | 1.33 | 0.28 | 1.48 | 0.97 |
| 31 | 1.61 | 3.60 | 1.11 | 0.09 | ..... | ..... | 1.47 | 0.90 |

MONTHLY DISCHARGE of Sevenpersons River near Medicine Hat, for 1915.

(Drainage area 797 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March (28–31) | 184.00 | 63.00 | 107.00 | 0.1340 | 0.020 | 849 |
| April | 450.00 | 3.20 | 78.00 | 0.0980 | 0.110 | 4,641 |
| May | 12.20 | 0.17 | 3.80 | 0.0048 | 0.006 | 234 |
| June | 17.50 | 0.33 | 4.40 | 0.0055 | 0.006 | 262 |
| July | 4.60 | 0.08 | 1.14 | 0.0014 | 0.002 | 70 |
| August | 2.80 | 0.06 | 0.48 | 0.0006 | 0.001 | 30 |
| September | 1.52 | 0.09 | 0.56 | 0.0007 | 0.001 | 33 |
| October | 1.03 | 0.39 | 0.81 | 0.0010 | 0.001 | 50 |
| The period | ..... | ..... | ..... | ..... | 0.147 | 6,169 |

## LAKE JOHNSTON DRAINAGE BASIN.

*General Description.*

Lake Johnston lies about twenty miles southwest of the city of Moosejaw. It is about twenty-five miles long and fifteen wide, and covers an area of nearly five townships. Almost all the drainage into the lake comes from the south and west, through Wood River. The main tributaries of Wood River are Wiwa Creek, Notukeu Creek, Pinto Creek and Wood Creek. These drain a large area, but owing to the limited rainfall and the small slope of the drainage basin, the run-off is comparatively small.

Lake Johnston has no surface outlet and there has been no surface flow from Lake Chaplin to Lake Johnston for several years. There is often considerable flow in Wood River in the spring, and there is always some discharge at all seasons; nevertheless, the lake has during recent years receded.

The lower part of Wood River has a very small fall and is more of the nature of a long slough than that of a running stream. The channel is from twenty to fifty feet wide, and is from two to five feet deep. The bottom is composed of soft clay and is covered with weeds and grass. There is so little fall that it would be impossible to take out water by gravity and a dam would flood a large area of good agricultural land. There is therefore little possibility of irrigation development in this basin.

This drainage basin includes a large area of very good agricultural land. This is pretty well taken up by settlers and is being farmed with good results. There is one irrigation scheme on Pearce Creek, a tributary of Notukeu Creek.

### NOTUKEU CREEK NEAR VANGUARD.

*Location.*—On the NW. ¼ Sec. 10, Tp. 11, Rge. 10, W. 3rd Mer.

*Records available.*—August 6, 1914, to December 31, 1915.

*Gauge.*—Vertical staff near traffic bridge. Zero elevation maintained at 77.94 feet since establishment. Vertical staff below a dam one-quarter mile downstream from bridge established August 19, 1915. Zero elevation maintained at elevation 77.04 feet since establishment.

*Bench-marks.*—Painted top of large bolt on plate, top of left pier, downstream side. Assumed elevation, 100.00 feet. Permanent iron bench-mark on right bank, thirty feet upstream from new gauge. Elevation, 85.19 feet above same datum as first bench-mark.

*Channel.*—Above dam, gauge heights affected by changes in dam; below dam, permanent.

*Discharge measurements.*—By wading or from traffic bridge.

*Open water.*—April 4, to November 9, 1915.

*Accuracy.*—Owing to a combination of circumstances, discharge records for 1915 are only an estimate.

*Observer.*—Miss Constance Ripley.

DISCHARGE MEASUREMENTS of Notukeu Creek at Vanguard, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 14 | J. E. Caughey | ..... | ..... | ..... | 1.38 | Nil. |
| Feb. 18 | F. R. Steinberger | ..... | ..... | ..... | 1.40 | .....*a* |
| Mar. 11 | do | ..... | ..... | ..... | 1.45 | ....*a* |
| June 3 | F. K. Beach | 36.5 | 48.0 | 0.58 | 2.59 | 27.00 |
| June 26 | do | 20.5 | 32.0 | 0.35 | 2.50 | 11.00 |
| Aug. 5 | do | 23.0 | 8.2 | 1.15 | 3.74 | 9.40 |
| Aug. 26 | do | 12.8 | 3.5 | 0.70 | 0.71*b* | 2.50 |
| Sept. 27 | do | 12.7 | 3.1 | 0.76 | 0.72*b* | 2.30 |
| Oct. 19 | do | 11.0 | 4.0 | 0.96 | 1.96<br>0.78*b* | 3.90 |
| Nov. 11 | W. R. McCaffrey | 12.0 | 8.2 | 0.32 | 0.70*b* | 2.60 |
| Nov. 23 | do | 9.5 | 2.4 | 0.58 | 0.62*b* | 1.42 |
| Dec. 7 | do | 7.0 | 1.6 | 0.59 | 0.50*b* | 0.95 |
| Dec. 21 | do | 7.0 | 1.2 | 0.57 | 0.43*b* | 0.68 |

*a* Small trickle.
*b* New gauge

DAILY GAUGE HEIGHT AND DISCHARGE of Notukeu Creek near Vanguard, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.32*a* | Nil. | 1.38 | Nil. | 1.42 | Nil. | 5.64 | 28.0 | 1.90 | 25.0 | 1.98 | 25.0 |
| 2 | 1.32 | " | 1.38 | " | 1.42 | " | 5.52 | 30.0 | 1.90 | 24.0 | 2.04 | 25.0 |
| 3 | 1.32 | " | 1.38 | " | 1.42 | " | 5.62 | 39.0 | 1.90 | 24.0 | 2.11 | 27.0 |
| 4 | 1.31 | " | 1.38 | " | 1.42 | " | 5.80*a* | 60.0 | 1.89 | 24.0 | 2.19 | 27.0 |
| 5 | 1.25 | " | 1.38 | " | 1.42 | " | ..... | 200.0 | 1.87 | 24.0 | 2.28 | 27.0 |
| 6 | 1.18 | " | 1.38 | " | 1.42 | " | 5.60 | 90.0 | 1.87 | 24.0 | 2.35 | 27.0 |
| 7 | 1.18 | " | 1.38 | " | 1.42 | " | 3.78 | 58.0 | 1.88 | 24.0 | 2.39 | 27.0 |
| 8 | 1.15 | " | 1.38 | " | 1.42 | " | 3.57 | 48.0 | 1.88 | 24.1 | 2.41 | 26.0 |
| 9 | 1.15 | " | 1.38 | " | 1.46 | " | 3.17 | 44.0 | 1.88 | 24.0 | 2.41 | 26.0 |
| 10 | 1.16 | " | 1.38 | " | 1.48 | " | 2.88 | 42.0 | 1.88 | 25.0 | 2.41 | 25.0 |
| 11 | 1.16 | " | 1.38 | " | 1.50 | " | 2.68 | 40.0 | 1.91 | 26.0 | 2.43 | 25.0 |
| 12 | 1.15 | " | 1.38 | " | 1.52 | " | 2.62 | 38.0 | 1.91 | 27.0 | 2.43 | 24.0 |
| 13 | 1.15 | " | 1.38 | " | 1.54 | " | 2.52 | 36.0 | 1.95 | 27.0 | 2.46 | 23.0 |
| 14 | 1.10 | " | 1.38 | " | 1.56 | 0.3 | 2.43 | 35.0 | 2.01 | 28.0 | 2.46 | 22.0 |
| 15 | 1.38 | " | 1.38 | " | 1.58 | 0.5 | 2.33 | 34.0 | 2.08 | 28.0 | 2.46 | 21.0 |
| 16 | 1.38 | " | 1.38 | " | 1.60 | 0.7 | 2.23 | 33.0 | 2.14 | 28.0 | 2.46 | 20.0 |
| 17 | 1.36 | " | 1.38 | " | 1.63 | 0.8 | 2.23 | 32.0 | 2.15 | 28.0 | 2.48 | 19.1 |
| 18 | 1.36 | " | 1.40 | " | 1.65 | 1.0 | 2.19 | 32.0 | 2.15 | 28.0 | 2.48 | 18.2 |
| 19 | 1.36 | " | 1.40 | " | 1.65 | 1.2 | 2.15 | 31.0 | 2.15 | 28.0 | 2.49 | 17.3 |
| 20 | 1.36 | " | 1.40 | " | 1.65 | 1.8 | 2.11 | 30.0 | 2.15 | 28.0 | 2.51 | 16.4 |
| 21 | 1.36 | " | 1.40 | " | 1.65 | 2.0 | 2.11 | 30.0 | 2.15 | 27.0 | 2.48 | 15.7 |
| 22 | 1.36 | " | 1.40 | " | 3.68 | 15.0 | 2.05 | 29.0 | 2.15 | 27.0 | 2.48 | 14.8 |
| 23 | 1.39 | " | 1.40 | " | 3.81 | 17.8 | 1.97 | 28.0 | 2.15 | 27.0 | 2.48 | 13.9 |
| 24 | 1.39 | " | 1.40 | " | 3.65 | 18.8 | 1.91 | 27.0 | 2.15 | 28.0 | 2.49 | 12.9 |
| 25 | 1.39 | " | 1.40 | " | 4.46 | 20.0 | 1.90 | 26.0 | 2.17 | 28.0 | 2.49 | 12.0 |
| 26 | 1.39 | " | 1.40 | " | ..... | 21.0 | 1.90 | 26.0 | 2.19 | 28.0 | 2.50 | 11.0 |
| 27 | 1.36 | " | 1.40 | " | ..... | 22.0 | 1.90 | 26.0 | 2.18 | 26.0 | 2.50 | 10.8 |
| 28 | 1.36 | " | 1.45 | " | ..... | 24.0 | 1.90 | 26.0 | 2.08 | 25.0 | 2.50 | 10.7 |
| 29 | 1.36 | " | ..... | ..... | 5.60 | 25.0 | 1.90 | 26.0 | 2.00 | 24.0 | 2.50 | 10.6 |
| 30 | 1.36 | " | ..... | ..... | 5.48 | 26.0 | 1.90 | 26.0 | 1.92 | 24.0 | 2.50 | 10.5 |
| 31 | 1.36 | " | ..... | ..... | 5.36 | 27.0 | ..... | ..... | 1.90 | 24.0 | ..... | ..... |

*a–a* Ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Notukeu Creek near Vanguard, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.57 | 10.4 | 3.69 | 9.2 | 0.68 | 2.0 | 0.70 | 2.5 | 0.76 | 4.0 | 0.62 | 1.30 |
| 2 | 2.58 | 10.4 | 4.04 | 9.2 | 0.67 | 1.8 | 0.70 | 2.5 | 0.74 | 3.7 | 0.59 | 1.20 |
| 3 | 2.68 | 10.4 | 3.97 | 9.2 | 0.67 | 1.7 | 0.70 | 2.5 | 0.74 | 3.0 | 0.55 | 1.10 |
| 4 | 2.70 | 10.4 | 3.83 | 9.3 | 0.67 | 1.7 | 0.70 | 2.3 | 0.72 | 2.7 | 0.50 | 1.00 |
| 5 | 3.12 | 10.4 | 3.74 | 9.4 | 0.67 | 1.7 | 0.72 | 2.4 | 0.71 | 2.7 | 0.51 | 1.00 |
| 6 | 3.42 | 10.3 | 3.71 | 9.3 | 0.67 | 1.7 | 0.73 | 2.9 | 0.71 | 2.7 | 0.50 | 0.97 |
| 7 | 3.47 | 10.2 | 3.68 | 9.0 | 0.67 | 1.7 | 0.74 | 3.2 | 0.71 | 2.4 | 0.50 | 0.96 |
| 8 | 3.52 | 10.2 | 3.58 | 8.8 | 0.67 | 1.7 | 0.75 | 3.3 | 0.70 | 2.4 | 0.53 | 0.96 |
| 9 | 3.63 | 10.2 | 3.56 | 8.3 | 0.67 | 1.7 | 0.75 | 3.4 | 0.70*b* | 2.5 | 0.56 | 0.98 |
| 10 | 3.58 | 10.2 | 3.52 | 7.8 | 0.67 | 1.7 | 0.75 | 3.4 | 0.70 | 2.6 | 0.58 | 0.99 |
| 11 | 3.50 | 10.1 | 3.50 | 7.0 | 0.67 | 1.8 | 0.75 | 3.4 | 0.70 | 2.6 | 0.60 | 0.99 |
| 12 | 3.30 | 10.1 | 3.48 | 6.3 | 0.67 | 1.8 | 0.75 | 3.4 | 0.70 | 2.4 | 0.60 | 1.00 |
| 13 | 3.30 | 10.1 | 3.44 | 5.8 | 0.70 | 2.2 | 0.75 | 3.5 | 0.70 | 2.1 | 0.60 | 0.99 |
| 14 | 3.38 | 10.1 | 3.40 | 5.0 | 0.70 | 2.4 | 0.75 | 3.5 | 0.70 | 2.1 | 0.60 | 0.98 |
| 15 | 3.47 | 10.1 | 3.33 | 4.4 | 0.70 | 2.4 | 0.75 | 3.5 | 0.70 | 2.1 | 0.60 | 0.97 |
| 16 | 3.47 | 10.1 | 3.26 | 3.8 | 0.70 | 2.4 | 0.75 | 3.5 | 0.70 | 2.1 | 0.60 | 0.96 |
| 17 | 3.48 | 10.1 | 2.62 | 3.2 | 0.70 | 2.4 | 0.75 | 3.5 | 0.70 | 2.0 | 0.60 | 0.94 |
| 18 | 3.49 | 10.1 | 2.19 | 2.8 | 0.70 | 2.3 | 0.75 | 3.6 | 0.69 | 2.0 | 0.60 | 0.89 |
| 19 | 3.43 | 10.0 | 0.64*a* | 2.4 | 0.70 | 2.3 | 0.75 | 3.6 | 0.67 | 1.9 | 0.53 | 0.76 |
| 20 | 3.53 | 9.9 | 0.74 | 3.1 | 0.70 | 2.3 | 0.75 | 3.7 | 0.63 | 1.8 | 0.43 | 0.69 |
| 21 | 3.62 | 9.9 | 0.69 | 2.2 | 0.70 | 2.3 | 0.76 | 3.7 | 0.65 | 1.7 | 0.43 | 0.68 |
| 22 | 3.62 | 9.8 | 0.64 | 2.5 | 0.70 | 2.3 | 0.78 | 3.7 | 0.63 | 1.6 | 0.42 | 0.67 |
| 23 | 3.62 | 9.7 | 0.64 | 2.6 | 0.70 | 2.3 | 0.78 | 4.0 | 0.62 | 1.5 | 0.41 | 0.66 |
| 24 | 3.62 | 9.6 | 0.70 | 2.5 | 0.70 | 2.3 | 0.78 | 4.1 | 0.62 | 1.5 | 0.41 | 0.64 |
| 25 | 3.68 | 9.5 | 0.70 | 2.5 | 0.70 | 2.4 | 0.78 | 4.1 | 0.64 | 1.5 | 0.40 | 0.62 |
| 26 | 3.78 | 9.5 | 0.70 | 2.5 | 0.70 | 2.4 | 0.78 | 4.1 | 0.65 | 1.5 | 0.39 | 0.60 |
| 27 | 3.70 | 9.5 | 0.70 | 2.4 | 0.70 | 2.4 | 0.78 | 4.1 | 0.67 | 1.5 | 0.38 | 0.58 |
| 28 | 3.62 | 9.5 | 0.70 | 2.4 | 0.70 | 2.5 | 0.78 | 4.2 | 0.69 | 1.5 | 0.36 | 0.55 |
| 29 | 3.52 | 9.5 | 0.70 | 2.4 | 0.70 | 2.5 | 0.78 | 4.2 | 0.69 | 1.4 | 0.34 | 0.51 |
| 30 | 3.42 | 9.4 | 0.70 | 2.3 | 0.70 | 2.5 | 0.78 | 4.3 | 0.68 | 1.4 | 0.32 | 0.44 |
| 31 | 3.17 | 9.3 | 0.70 | 2.3 | ..... | ..... | 0.77 | 4.2 | ..... | ..... | 0.31*b* | 0.35 |

*a* Observations start at new gauge.
*b–b* Ice conditions.

MONTHLY DISCHARGE of Notukeu Creek near Vanguard, for 1915.

(Drainage area 1,406 square miles).

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | Nil. | Nil. | Nil. | Nil. | Nil. | Nil. |
| February | " | " | " | " | " | " |
| March | 27.0 | 0.30 | 7.30 | 0.0052 | 0.006 | 449 |
| April | 200.0 | 26.00 | 42.00 | 0.0299 | 0.033 | 2,499 |
| May | 28.0 | 24.00 | 26.00 | 0.0185 | 0.021 | 1,599 |
| June | 27.0 | 10.50 | 19.70 | 0.0140 | 0.016 | 1,172 |
| July | 10.4 | 9.30 | 10.00 | 0.0071 | 0.008 | 615 |
| August | 9.4 | 2.20 | 5.20 | 0.0037 | 0.004 | 320 |
| September | 2.5 | 1.70 | 2.10 | 0.0015 | 0.002 | 125 |
| October | 4.3 | 2.30 | 3.50 | 0.0025 | 0.003 | 215 |
| November | 4.0 | 1.40 | 2.20 | 0.0016 | 0.002 | 130 |
| December | 1.3 | 0.35 | 0.84 | 0.0006 | 0.001 | 52 |
| The year | ..... | ..... | ..... | ..... | 0.096 | 7,176 |

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Lake Johnston drainage basin, in 1915.

| Date. | Engineer. | Stream. | Location. | Width. | Area of Section. | Mean Velocity. | Discharge. |
|---|---|---|---|---|---|---|---|
| | | | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Sec.-ft.* |
| April 14.... | F. R. Steinberger.. | Pinto Creek..... | NW. 7-6-11-3.... | ..... | ..... | ..... | 0.274 |

## QU'APPELLE RIVER DRAINAGE BASIN.

*General Description.*

Qu'Appelle River rises in Township 23, Range 4, West of the 3rd Meridian, and flows eastward into the Assiniboine River in Township 28, Range 17, West of the 1st Meridian. These waters eventually find their way into Hudson Bay through the Red River, Lake Winnipeg and Nelson River.

The chief tributaries of Qu'Appelle River are Moosejaw Creek, Last Mountain Lake, Wascana Creek and Loon Creek. Last Mountain is the largest lake in the basin, being some sixty miles long and from one to three miles wide.

The valley of the main stream is from two to three hundred feet deep, with a flat from one to three miles wide along the river. This flat is covered in many places with brush, and the side hills are in many places well wooded. The bench lands above the river are mostly level prairie, much of which is now under cultivation.

The mean annual rainfall at Moosejaw is fourteen inches, at Regina fifteen inches, and at Indian Head nineteen inches. The streams are frozen during the winter months, and there is usually an abundant snowfall.

There are several irrigation and many industrial water rights in this basin.

During 1915, the rainfall over part of this drainage area was very deficient, the total precipitation for the twelve months beginning December 1, 1914, at Regina, being 9.54 inches, at Moosejaw 13.72 inches and at Qu'Appelle 18.12 inches. As nearly as can be learned there was no flow during 1915 from Wascana Creek into Wascana Lake, an artificial lake in front of the parliament buildings at Regina.

### QU'APPELLE RIVER AT LUMSDEN.

*Location.*—On the NW. ¼ Sec. 33, Tp. 19, Rge. 21, W. 2nd Mer., at farm near Lumsden, Saskatchewan.

*Records available.*—May 12, 1911, to December 31, 1915.

*Gauge.*—Vertical staff. Zero of gauge maintained at elevation of 85.35 feet during 1911-13; and at elevation of 85.16 feet during 1914-15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Permanent, but debris on control affects gauge height.

*Discharge measurements.*—By wading or from bridge.

*Winter flow.*—Affected by ice.

*Observers.*—J. G. Miller and W. J. Steele.

DISCHARGE MEASUREMENTS of Qu'Appelle River at Lumsden, in 1915.

| Date | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height | Discharge |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 1 | F. R. Steinberger | 12.5 | 5.88 | 0.18 | 1.99 | 1.06 |
| Jan. 21 | do | 9.5 | 3.05 | 0.25 | 1.95 | 0.76 |
| Feb. 19 | E. W. W. Hughes | 10.0 | 2.14 | 0.00 | 1.76 | 0.00 |
| Mar. 10 | do | | | 0.00 | 1.73 | 0.00 |
| Mar. 27.. | do | | | 0.00 | 3.00 | 0.00 |
| April 21 | do | 18.3 | 40.88 | 0.26 | 2.65 | 10.73 |
| June 12 | F. K. Beach | 27.5 | 43.45 | 0.16 | 2.45 | 7.07 |
| July 29 | do | 27.0 | 31.42 | 0.13 | 2.24 | 4.08 |
| Sept. 6 | do | 19.5 | 5.63 | 0.31 | 2.21 | 1.74 |
| Sept. 6 | do | 17.0 | 9.14 | 0.24 | 2.20 | 2.14 |
| Oct. 5 | do | 24.5 | 26.72 | 0.20 | 2.54 | 5.29 |
| Nov. 12 | F. R. Steinberger | 22.0 | 20.60 | 0.27 | 2.31 | 5.17 |
| Dec. 3 | do | 17.0 | 6.20 | 0.46 | 2.26 | 2.89 |
| Dec. 20 | do | 11.0 | 4.15 | 0.28 | 2.05 | 1.20 |

DAILY GAUGE HEIGHT AND DISCHARGE of Qu'Appelle River at Lumsden, for 1915.

| Day. | January. | | February. | | March. | | May. | | April. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.99*a* | 1.05 | 1.80 | 0.20 | 1.69 | Nil. | 2.78 | 0.66 | 2.44 | 6.9 | 2.55 | 8.9 |
| 2 | 2.02 | 1.04 | 1.80 | 0.20 | 1.69 | " | 2.95 | 0.89 | 2.54 | 8.7 | 2.52 | 8.3 |
| 3 | 2.00 | 1.02 | 1.81 | 0.20 | 1.67 | " | 3.12 | 1.12 | 2.54 | 8.7 | 2.49 | 7.8 |
| 4 | 1.98 | 1.02 | 1.81 | 0.20 | 1.69 | " | 3.15 | 1.40 | 2.52 | 8.3 | 2.48 | 7.6 |
| 5 | 1.98 | 1.00 | 1.82 | 0.19 | 1.71 | " | 3.14 | 1.62 | 2.55 | 8.9 | 2.49 | 7.8 |
| 6 | 1.97 | 0.98 | 1.82 | 0.19 | 1.70 | " | 2.92 | 2.00 | 2.52 | 8.3 | 2.49 | 7.8 |
| 7 | 1.96 | 0.97 | 1.83 | 0.16 | 1.70 | " | 2.94 | 4.00 | 2.62 | 10.2 | 2.48 | 7.6 |
| 8 | 1.96 | 0.98 | 1.81 | 0.11 | 1.71 | " | 2.97 | 6.10 | 2.61 | 10.0 | 2.44 | 6.9 |
| 9 | 1.98 | 1.00 | 1.79 | 0.08 | 1.72 | " | 3.32 | 8.30 | 2.61 | 10.0 | 2.45 | 7.1 |
| 10 | 1.98 | 1.04 | 1.75 | 0.05 | 1.72 | " | 3.26 | 10.40 | 2.68 | 11.3 | 2.46 | 7.3 |
| 11 | 1.98 | 1.01 | 1.73 | 0.04 | 1.73 | " | 3.14 | 12.50 | 2.63 | 10.4 | 2.50 | 7.9 |
| 12 | 1.98 | 0.97 | 1.73 | 0.03 | 1.76 | " | 3.11*a* | 14.70 | 2.61 | 10.0 | 2.46 | 7.3 |
| 13 | 1.99 | 0.94 | 1.75 | 0.02 | 1.75 | " | 3.08 | 18.70 | 2.64 | 10.5 | 2.56 | 9.1 |
| 14 | 2.00 | 0.91 | 1.75 | 0.02 | 1.73 | " | 2.95 | 16.30 | 2.74 | 12.4 | 2.55 | 8.9 |
| 15 | 2.00 | 0.88 | 1.75 | 0.02 | 1.75 | " | 2.76 | 12.80 | 2.84 | 14.3 | 2.52 | 8.3 |
| 16 | 2.01 | 0.87 | 1.72 | 0.01 | 1.76 | " | 2.84 | 14.30 | 2.94 | 16.1 | 2.49 | 7.8 |
| 17 | 2.00 | 0.84 | 1.69 | Nil. | 1.76 | " | 2.96 | 16.50 | 2.95 | 16.3 | 2.48 | 7.6 |
| 18 | 2.00 | 0.81 | 1.71 | " | 1.76 | " | 2.81 | 13.70 | 2.96 | 16.5 | 2.48 | 7.6 |
| 19 | 2.00 | 0.80 | 1.71 | " | 1.77 | " | 2.72 | 12.00 | 2.99 | 17.0 | 2.46 | 7.3 |
| 20 | 2.00 | 0.78 | 1.69 | " | 1.87 | 0.04 | 2.66 | 10.90 | 2.92 | 15.8 | 2.45 | 7.1 |
| 21 | 1.92 | 0.75 | 1.69 | " | 1.91 | 0.22 | 2.66 | 10.90 | 2.84 | 14.3 | 2.49 | 7.8 |
| 22 | 1.90 | 0.71 | 1.71 | " | 3.26 | 0.31 | 2.62 | 10.20 | 2.74 | 12.4 | 2.51 | 8.1 |
| 23 | 1.88 | 0.69 | 1.71 | " | 3.32 | 0.37 | 2.62 | 10.20 | 2.66 | 10.9 | 2.49 | 7.8 |
| 24 | 1.85 | 0.62 | 1.70 | " | 3.33 | 0.32 | 2.65 | 10.70 | 2.63 | 10.4 | 2.46 | 7.3 |
| 25 | 1.83 | 0.55 | 1.70 | " | 3.27 | 0.20 | 2.58 | 9.40 | 2.63 | 10.4 | 2.40 | 6.3 |
| 26 | 1.81 | 0.47 | 1.70 | " | 3.02 | 0.04 | 2.54 | 8.70 | 2.63 | 10.4 | 2.48 | 7.6 |
| 27 | 1.81 | 0.38 | 1.67 | " | 3.00 | Nil. | 2.53 | 8.50 | 2.64 | 10.5 | 2.46 | 7.3 |
| 28 | 1.80 | 0.30 | 1.69 | " | 2.95 | " | 2.48 | 7.60 | 2.62 | 10.2 | 2.46 | 7.3 |
| 29 | 1.80 | 0.23 | ..... | ..... | 2.90 | 0.12 | 2.48 | 7.60 | 2.60 | 9.8 | 2.43 | 6.8 |
| 30 | 1.80 | 0.21 | ..... | ..... | 2.88 | 0.29 | 2.44 | 6.90 | 2.58 | 9.4 | 2.45 | 7.1 |
| 31 | 1.80 | 0.20 | ..... | ..... | 2.78 | 0.48 | ..... | ..... | 2.56 | 9.1 | ..... | ..... |

*a* to *a* Ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Qu'Appelle River at Lumsden, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.46 | 7.2 | 2.18 | 3.4 | 2.18 | 2.0 | 2.50 | 5.0 | 2.37 | 8.20 | 2.28 | 2.24 |
| 2 | 2.54 | 8.7 | 2.16 | 3.2 | 2.22 | 2.3 | 2.54 | 5.5 | 2.43 | 9.30 | 2.29 | 2.27 |
| 3 | 2.52 | 8.3 | 2.16 | 3.2 | 2.30 | 3.1 | 2.54 | 5.4 | 2.35 | 7.80 | 2.26 | 2.26 |
| 4 | 2.46 | 7.2 | 2.14 | 3.0 | 2.34 | 3.5 | 2.57 | 5.8 | 2.37 | 8.20 | 2.27 | 2.25 |
| 5 | 2.44 | 6.9 | 2.12 | 2.8 | 2.36 | 3.7 | 2.60 | 6.2 | 2.39 | 8.60 | 2.29 | 2.23 |
| 6 | 2.43 | 6.7 | 2.12 | 2.8 | 2.20 | 2.2 | 2.57 | 6.2 | 2.37 | 8.20 | 2.26 | 2.24 |
| 7 | 2.44 | 6.9 | 2.10 | 2.6 | 2.24 | 2.5 | 2.57 | 6.6 | 2.41*a* | 7.00 | 2.28 | 2.26 |
| 8 | 2.41 | 6.4 | 2.08 | 2.4 | 2.34 | 3.5 | 2.57 | 7.2 | 2.43*a* | 5.20 | 2.30 | 2.28 |
| 9 | 2.46 | 7.2 | 2.05 | 2.1 | 2.36 | 3.7 | 2.57 | 7.7 | 2.45*b* | 3.80 | 2.27 | 2.25 |
| 10 | 2.44 | 6.9 | 2.02 | 1.9 | 2.36 | 3.7 | 2.56 | 8.0 | 2.43 | 2.80 | 2.26 | 2.24 |
| 11 | 2.42 | 6.6 | 2.01 | 1.8 | 2.39 | 4.1 | 2.56 | 8.6 | 2.42 | 2.50 | 2.23 | 2.24 |
| 12 | 2.44 | 6.9 | 2.04 | 2.0 | 2.41 | 4.3 | 2.56 | 9.2 | 2.41 | 2.31 | 2.21 | 2.23 |
| 13 | 2.41 | 6.4 | 2.06 | 2.2 | 2.46 | 5.0 | 2.58 | 10.3 | 2.38 | 2.27 | 2.24 | 2.20 |
| 14 | 2.38 | 6.0 | 2.05 | 2.1 | 2.52 | 5.8 | 2.60 | 11.2 | 2.37 | 2.16 | 2.19 | 2.18 |
| 15 | 2.40 | 6.3 | 2.02 | 1.9 | 2.48 | 5.2 | 2.56 | 11.1 | 2.36 | 2.10 | 2.17 | 2.17 |
| 16 | 2.40 | 6.3 | 2.03 | 1.9 | 2.32 | 3.3 | 2.57 | 12.0 | 2.32 | 2.09 | 2.14 | 2.15 |
| 17 | 2.40 | 6.3 | 2.06 | 2.2 | 2.35 | 3.6 | 2.56 | 11.8 | 2.34 | 2.10 | 2.10 | 2.13 |
| 18 | 2.38 | 6.0 | 2.06 | 2.2 | 2.35 | 3.6 | 2.60 | 12.5 | 2.34 | 2.11 | 2.08 | 2.10 |
| 19 | 2.36 | 5.7 | 2.08 | 2.4 | 2.31 | 3.1 | 2.57 | 12.0 | 2.31 | 2.14 | 2.06 | 2.08 |
| 20 | 2.38 | 6.0 | 2.11 | 2.7 | 2.34 | 3.4 | 2.54 | 11.4 | 2.34 | 2.17 | 2.05 | 2.05 |
| 21 | 2.38 | 6.0 | 2.19 | 3.4 | 2.32 | 3.2 | 2.58 | 10.3 | 2.30 | 2.18 | 2.06 | 2.05 |
| 22 | 2.32 | 5.1 | 2.14 | 2.8 | 2.34 | 3.4 | 2.54 | 11.4 | 2.32 | 2.19 | 2.03 | 2.04 |
| 23 | 2.30 | 4.8 | 2.10 | 2.3 | 2.34 | 3.4 | 2.55 | 11.6 | 2.34 | 2.19 | 2.01 | 2.02 |
| 24 | 2.28 | 4.6 | 2.14 | 2.5 | 2.35 | 3.4 | 2.52 | 11.0 | 2.37 | 2.21 | 2.02 | 1.98 |
| 25 | 2.30 | 4.8 | 2.25 | 3.5 | 2.36 | 3.5 | 2.50 | 10.7 | 2.37 | 2.21 | 2.03*c* | 1.91 |
| 26 | 2.28 | 4.6 | 2.30 | 3.9 | 2.38 | 3.7 | 2.47 | 10.1 | 2.34 | 2.21 | 2.04 | 1.74 |
| 27 | 2.24 | 4.1 | 2.35 | 4.3 | 2.40 | 3.9 | 2.44 | 9.5 | 2.32 | 2.22 | 2.02 | 1.71 |
| 28 | 2.20 | 3.6 | 2.32 | 3.7 | 2.46 | 4.6 | 2.44 | 9.5 | 2.35 | 2.23 | 2.01 | 1.69 |
| 29 | 2.20 | 3.6 | 2.20 | 2.4 | 2.46 | 4.6 | 2.46 | 9.9 | 2.36 | 2.22 | 2.01 | 1.60 |
| 30 | 2.19 | 3.5 | 2.19 | 2.1 | 2.46 | 4.5 | 2.50 | 10.7 | 2.32 | 2.23 | 2.02 | 1.44 |
| 31 | 2.18 | 3.4 | 2.16 | 1.8 | ..... | ..... | 2.47 | 10.1 | ..... | ..... | 1.99*b* | 1.37 |

*a* Freeze up; discharge interpolated.
*b* to *b* Ice conditions.
*c* Gauge height interpolated.

MONTHLY DISCHARGE of Qu'Appelle River at Lumsden, for 1915.

(Drainage area 6,160 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet |
| January | 1.05 | 0.20 | 0.77 | 0.00012 | 0.0001 | 47 |
| February | 0.20 | Nil. | 0.06 | 0.00001 | 0.0000 | 3 |
| March | 0.48 | " | 0.08 | 0.00001 | 0.0000 | 5 |
| April | 18.70 | 0.66 | 9.00 | 0.00146 | 0.0016 | 536 |
| May | 17.00 | 6.90 | 11.20 | 0.00182 | 0.0020 | 689 |
| June | 9.10 | 6.30 | 7.60 | 0.00123 | 0.0014 | 452 |
| July | 8.70 | 3.40 | 5.90 | 0.00096 | 0.0011 | 363 |
| August | 4.30 | 1.80 | 2.60 | 0.00042 | 0.0005 | 160 |
| September | 5.80 | 2.00 | 3.70 | 0.00060 | 0.0007 | 220 |
| October | 12.50 | 5.00 | 9.30 | 0.00150 | 0.0017 | 572 |
| November | 9.30 | 2.09 | 3.80 | 0.00062 | 0.0007 | 226 |
| December | 2.28 | 1.37 | 2.10 | 0.00034 | 0.0004 | 129 |
| The year | | | | | 0.0102 | 3,402 |

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Qu'Appelle River drainage basin, in 1915.

| Date. | Engineer. | Stream. | Location. | Width. | Area of Section. | Mean Velocity. | Discharge. |
|---|---|---|---|---|---|---|---|
| | | | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Sec.-ft.* |
| April 22.... | E. W. W. Hughes.. | Wascana Creek.... | Regina..... | ..... | ..... | ..... | Nil. |
| Sept. 21.... | F. K. Beach..... | do ... | do ..... | ..... | ..... | ..... | " |

## MOOSEJAW CREEK DRAINAGE BASIN.

### *General Description.*

Moosejaw Creek rises in the Yellowgrass Marsh, which lies in Townships 9 and 10, Range 17, West of the 2nd Meridian, and flows in a north and westerly direction until it reaches the city of Moosejaw, where it is joined by Thunder Creek. From Moosejaw it follows an easterly and northerly course, finally emptying into the Qu'Appelle River near Buffalo Pound Lake. From the headwaters to the city of Moosejaw the drainage area is estimated at about 1,830 square miles. This area is almost entirely devoid of tree growth, except in the vicinity of Moosejaw, where the valley is lined with brush.

Throughout its entire length the creek flows in a very crooked but well defined channel. The upper portion of the valley is small, being merely a depression, but it gradually increases in size until at Drinkwater it is about thirty feet deep and at Moosejaw eighty feet deep. The fall in the cre k is very small, and particularly so between Drinkwater and Moosejaw, where the total fall is only 67.5 feet or an average of 2.3 feet per mile of valley.

The Canadian Pacific Railway Company has dams at Milestone, Rouleau, Drinkwater, two at Moosejaw and one at Pasqua. There is also a municipality dam in Section 19, Township 15, Range 24, West of the 2nd Meridian, which supplies water to the neighbourhood during periods when there is no flow in the creek, and the city of Moosejaw has a dam within the city limits to store water for fire fighting purposes.

Precipitation in this drainage basin during 1915 was very deficient. At Moosejaw, a large part of the area ordinarily flooded by the several dams became nearly dry late in the summer, leaving a noticeable shortage of water.

### MOOSEJAW CREEK NEAR LANG.

*Location.*—On traffic bridge on road allowance, east of the NE. ¼ Sec. 24, Tp. 11, Rge. 19, W. 2nd Mer., four miles west of the village of Lang.

*Records available.*—From June 21, 1911, to October 31, 1915.

*Gauge.*—Vertical staff. Zero elevation of gauge was maintained at 94.80 feet during 1911; 95.07 feet during 1912–13; 95.04 feet during 1914 and 1915.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Permanent.

*Discharge measurements.*—From bridge or by wading.

*Winter flow.*—No winter observations have been taken.

*Observer.*—Miss Irene Irvine.

*Run-off in 1915.*—Nil.

DAILY GAUGE HEIGHT AND DISCHARGE of Moosejaw Creek near Lang, for 1915.

| Day. | March. | | April. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | ..... | 0.33 | Nil. |
| 2 | ..... | ..... | 0.32 | " |
| 3 | ..... | ..... | 0.31 | " |
| 4 | ..... | ..... | 0.30 | " |
| 5 | ..... | ..... | 0.29 | " |
| 6 | ..... | ..... | 0.24 | " |
| 7 | ..... | ..... | 0.23 | " |
| 8 | ..... | ..... | 0.20 | " |
| 9 | ..... | ..... | 0.20 | " |
| 10 | ..... | ..... | ..... | ..... |
| 11 | ..... | ..... | ..... | ..... |
| 12 | ..... | ..... | ..... | ..... |
| 13 | ..... | ..... | ..... | ..... |
| 14 | ..... | ..... | ..... | ..... |
| 15 | ..... | ..... | ..... | ..... |
| 16 | ..... | ..... | ..... | ..... |
| 17 | ..... | ..... | ..... | ..... |
| 18 | ..... | ..... | ..... | ..... |
| 19 | ..... | ..... | ..... | ..... |
| 20 | ..... | ..... | ..... | ..... |
| 21 | ..... | ..... | ..... | ..... |
| 22 | 0.24 | Nil. | ..... | ..... |
| 23 | 0.29 | " | ..... | ..... |
| 24 | 0.28 | " | ..... | ..... |
| 25 | 0.29 | " | ..... | ..... |
| 26 | 0.29 | " | ..... | ..... |
| 27 | 0.34 | " | ..... | ..... |
| 28 | 0.35 | " | ..... | ..... |
| 29 | 0.39 | " | ..... | ..... |
| 30 | 0.39 | " | ..... | ..... |
| 31 | 0.36 | " | ..... | ..... |

Gauge heights shown indicate water in pools. Stream was dry April 10, to October 31.

## MOOSEJAW CREEK AT MCCARTHY'S FARM.

*Location.*—On the NW. ¼ Sec. 16, Tp. 16, Rge. 26, W. 2nd Mer., about three miles south of Moosejaw.

*Records available.*—April 7, 1910, to December 31, 1915.

*Gauge.*—Vertical staff. Zero elevation maintained at 83.03 feet during 1910–11; zero elevation maintained at 82.99 feet during 1912–13; zero elevation maintained at 81.99 feet during 1914–15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Permanent.

*Discharge measurements.*—From bridge or by wading.

*Observer.*—Miss Sadie McCarthy.

DISCHARGE MEASUREMENTS of Moosejaw Creek at McCarthy's Farm, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 15 | F. R. Steinberger | ..... | ..... | ..... | 1.19 | Nil. |
| Feb. 20 | E. W. W. Hughes | ..... | ..... | ..... | 0.70 | " |
| Mar. 8 | do | ..... | ..... | ..... | 0.64 | " |
| April 28 | do | 15.0 | 3.44 | 0.16 | 1.51 | 0.54 |
| June 16 | F. K. Beach | 9.7 | 2.16 | 0.13 | 1.41 | 0.29 |
| July 30 | do | ..... | ..... | ..... | ..... | Nil. |
| Aug. 23 | do | ..... | ..... | ..... | ..... | " |
| Sept. 23 | do | ..... | ..... | ..... | ..... | " |
| Oct. 25 | do | ..... | ..... | ..... | ..... | " |
| Dec. 7 | F. R. Steinberger | ..... | ..... | ..... | 0.30 | " |

DAILY GAUGE HEIGHT AND DISCHARGE of Moosejaw Creek at McCarthy's Farm, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.26 | Nil. | 0.91 | Nil. | 0.26 | Nil. | 1.10 | Nil. | 1.40 | 0.28 | 1.39 | 0.27 |
| 2 | 1.24 | " | 0.89 | " | 0.27 | " | 1.14*a* | 0.28 | 1.40 | 0.28 | 1.39 | 0.27 |
| 3 | 1.23 | " | 0.85 | " | 0.28 | " | 1.55*a* | 0.58 | 1.40 | 0.28 | 1.37 | 0.24 |
| 4 | 1.26 | " | 0.74 | " | 0.44 | " | 1.76 | 3.74 | 1.40 | 0.28 | 1.37 | 0.24 |
| 5 | 1.26 | " | 0.70 | " | 0.46 | " | 1.68 | 2.28 | 1.40 | 0.28 | 1.38 | 0.25 |
| 6 | 1.25 | " | 0.69 | " | 0.45 | " | 1.67 | 2.12 | 1.41 | 0.30 | 1.39 | 0.27 |
| 7 | 1.25 | " | 0.69 | " | 0.85 | " | 1.69 | 2.44 | 1.41 | 0.30 | 1.39 | 0.27 |
| 8 | 1.23 | " | 0.69 | " | 1.05 | " | 1.75 | 3.50 | 1.40 | 0.28 | 1.39 | 0.27 |
| 9 | 1.22 | " | 0.68 | " | 1.35 | " | 1.73 | 3.14 | 1.39 | 0.27 | 1.39 | 0.27 |
| 10 | 1.23 | " | 0.71 | " | 1.36 | " | 1.70 | 2.60 | 1.39 | 0.27 | 1.40 | 0.28 |
| 11 | 1.20 | " | 0.69 | " | 1.38 | " | 1.67 | 2.12 | 1.39 | 0.27 | 1.40 | 0.28 |
| 12 | 1.20 | " | 0.70 | " | 1.37 | " | 1.66 | 1.96 | 1.43 | 0.33 | 1.39 | 0.27 |
| 13 | 1.19 | " | 0.69 | " | 1.36 | " | 1.67 | 2.12 | 1.41 | 0.30 | 1.40 | 0.28 |
| 14 | 1.18 | " | 0.70 | " | 1.33 | " | 1.67 | 2.12 | 1.45 | 0.36 | 1.41 | 0.30 |
| 15 | 1.17 | " | 0.68 | " | 1.25 | " | 1.67 | 2.12 | 1.57 | 0.96 | 1.41 | 0.30 |
| 16 | 1.16 | " | 0.68 | " | 1.21 | " | 1.67 | 2.12 | 1.59 | 1.12 | 1.41 | 0.30 |
| 17 | 1.16 | " | 0.94 | " | 1.14 | " | 1.63 | 1.56 | 1.57 | 0.96 | 1.43 | 0.33 |
| 18 | 1.18 | " | 0.64 | " | 1.05 | " | 1.61 | 1.32 | 1.55 | 0.80 | 1.43 | 0.33 |
| 19 | 1.20 | " | 0.51 | " | 0.99 | " | 1.63 | 1.56 | 1.51 | 0.58 | 1.42 | 0.31 |
| 20 | 1.18 | " | 0.34 | " | 1.08 | " | 1.57 | 0.96 | 1.49 | 0.49 | 1.43 | 0.33 |
| 21 | 1.15 | " | 0.32 | " | 1.13 | " | 1.56 | 0.88 | 1.47 | 0.42 | 1.43 | 0.33 |
| 22 | 1.12 | " | 0.30 | " | 1.19 | " | 1.55 | 0.80 | 1.46 | 0.39 | 1.41 | 0.30 |
| 23 | 1.09 | " | 0.63 | " | 1.21 | " | 1.52 | 0.63 | 1.45 | 0.36 | 1.42 | 0.31 |
| 24 | 1.05 | " | 0.58 | " | 1.16 | " | 1.50 | 0.52 | 1.43 | 0.33 | 1.39 | 0.27 |
| 25 | 1.00 | " | 0.44 | " | 1.13 | " | 1.49 | 0.49 | 1.41 | 0.30 | 1.39 | 0.27 |
| 26 | 0.93 | " | 0.37 | " | 1.10 | " | 1.49 | 0.49 | 1.43 | 0.33 | 1.38 | 0.25 |
| 27 | 0.88 | " | 0.32 | " | 1.09 | " | 1.50 | 0.52 | 1.44 | 0.34 | 1.38 | 0.25 |
| 28 | 0.85 | " | 0.30 | " | 1.09 | " | 1.49 | 0.49 | 1.43 | 0.33 | 1.38 | 0.25 |
| 29 | 0.80 | " | ..... | ..... | 1.09 | " | 1.46 | 0.39 | 1.43 | 0.33 | 1.38 | 0.25 |
| 30 | 0.77 | " | ..... | ..... | 1.09 | " | 1.41 | 0.30 | 1.41 | 0.30 | 1.37 | 0.24 |
| 31 | 0.72 | " | ..... | ..... | 1.09 | " | ..... | ..... | 1.39 | 0.27 | ..... | .... |

*a* Ice breaking up. Discharges estimated.

DAILY GAUGE HEIGHT AND DISCHARGE of Moosejaw Creek at McCarthy's Farm, for 1915. —*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.37 | 0.24 | 1.13 | Nil. | ..... | Nil. | ..... | Nil. | ..... | Nil. | 0.25 | Nil. |
| 2 | 1.37 | 0.24 | 1.11 | " | ..... | " | ..... | " | ..... | " | 0.27 | " |
| 3 | 1.37 | 0.24 | 1.09 | " | ..... | " | ..... | " | ..... | " | 0.28 | " |
| 4 | 1.37 | 0.24 | 1.07 | " | ..... | " | ..... | " | ..... | " | 0.25 | " |
| 5 | 1.36 | 0.22 | 1.05 | " | ..... | " | ..... | " | ..... | " | 0.25 | " |
| 6 | 1.36 | 0.22 | 1.04 | " | ..... | " | ..... | " | .....*b* | " | 0.32 | " |
| 7 | 1.34 | 0.20 | .....*b* | " | ..... | " | ..... | " | 0.39 | " | 0.30 | " |
| 8 | 1.32 | 0.17 | ..... | " | ..... | " | ..... | " | 0.39 | " | 0.27 | " |
| 9 | 1.32 | 0.17 | ..... | " | ..... | " | ..... | " | 0.37 | " | 0.33 | " |
| 10 | 1.31 | 0.16 | ..... | " | ..... | " | ..... | " | 0.37 | " | 0.20 | " |
| 11 | 1.30 | 0.15 | ..... | " | ..... | " | ..... | " | 0.33 | " | 0.15 | " |
| 12 | 1.30 | 0.15 | ..... | " | ..... | " | ..... | " | 0.35 | " | 0.10 | " |
| 13 | 1.27 | 0.12 | ..... | " | ..... | " | ..... | " | 0.34 | " | 0.11 | " |
| 14 | 1.26 | 0.11 | ..... | " | ..... | " | ..... | " | 0.31 | " | 0.09 | " |
| 15 | 1.29 | 0.14 | ..... | " | ..... | " | ..... | " | 0.35 | " | 0.06 | " |
| 16 | 1.28 | 0.13 | ..... | " | ..... | " | ..... | " | 0.33 | " | 0.08 | " |
| 17 | 1.27 | 0.12 | ..... | " | ..... | " | ..... | " | 0.34 | " | 0.05 | " |
| 18 | 1.26 | 0.11 | ..... | " | ..... | " | ..... | " | 0.35 | " | 0.08 | " |
| 19 | 1.26 | 0.11 | ..... | " | ..... | " | ..... | " | 0.34 | " | 0.08 | " |
| 20 | 1.24 | 0.09 | ..... | " | ..... | " | ..... | " | 0.34 | " | 0.10 | " |
| 21 | 1.24 | 0.09 | ..... | " | ..... | " | ..... | " | 0.34 | " | 0.17 | " |
| 22 | 1.24 | 0.09 | ..... | " | ..... | " | ..... | " | 0.34 | " | 0.14 | " |
| 23 | 1.24 | 0.09 | ..... | " | ..... | " | ..... | " | 0.34 | " | 0.11 | " |
| 24 | 1.26 | 0.11 | ..... | " | ..... | " | ..... | " | 0.34 | " | 0.10 | " |
| 25 | 1.24 | 0.09 | ..... | " | ..... | " | ..... | " | 0.32 | " | 0.08 | " |
| 26 | 1.24 | 0.09 | ..... | " | ..... | " | ..... | " | 0.34 | " | 0.04 | " |
| 27 | 1.22 | 0.08 | ..... | " | ..... | " | ..... | " | 0.31 | " | 0.09 | " |
| 28 | 1.20 | 0.06 | ..... | " | ..... | " | ..... | " | 0.28 | " | 0.07 | " |
| 29 | 1.18 | 0.04 | ..... | " | ..... | " | ..... | " | 0.25 | " | 0.06 | " |
| 30 | 1.16 | 0.03 | ..... | " | ..... | " | ..... | " | 0.25 | " | 0.03 | " |
| 31 | 1.14 | 0.01 | ..... | " | ..... | ..... | ..... | " | ..... | ..... | 0.01 | " |

*b–b* Water in pools.

MONTHLY DISCHARGE of Moosejaw Creek at McCarthy's Farm, for 1915.

(Drainage area 1,719 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet |
| January | Nil. | Nil. | Nil | Nil. | Nil. | Nil |
| February | " | " | " | " | " | " |
| March | " | " | " | " | " | " |
| April | 3.74 | 0.28 | 1.47 | 0.00086 | 0.0010 | 87 |
| May | 1.12 | 0.27 | 0.41 | 0.00024 | 0.0003 | 21 |
| June | 0.31 | 0.24 | 0.28 | 0.00016 | 0.0002 | 17 |
| July | 0.24 | 0.01 | 0.13 | 0.00008 | 0.0001 | 8 |
| August | Nil | Nil | Nil | Nil | Nil | Nil |
| September | " | " | " | " | " | " |
| October | " | " | " | " | " | " |
| November | " | " | " | " | " | " |
| December | " | " | " | " | " | " |
| The year | | | | | 0.0018 | 127 |

SANDY CREEK NEAR CARON.

*Location.*—On the SE. ¼ Sec. 29, Tp. 17, Rge. 29, W. 2nd Mer.
*Records available.*—August 1, to December 31, 1915.
*Gauge.*—Vertical staff. Zero maintained at elevation of weir crest since establishment.
*Discharge measurements.*—From thirty-inch trapezoidal weir. Daily observations of head taken by observer.
*Observer.*—James Grazier.

DISCHARGE MEASUREMENTS of Sandy Creek near Caron, Sask., in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| June 14 | F. K. Beach | ..... | ..... | ..... | ..... | 1.34*a* |
| July 30 | do | ..... | ..... | ..... | 0.165 | 0.56*a* |
| Sept. 23 | do | ..... | ..... | ..... | 0.157 | 0.52*a* |
| Oct. 26 | do | ..... | ..... | ..... | 0.210 | 0.81*a* |
| Dec. 4 | F. R. Steinberger | ..... | ..... | ..... | 0.140 | 0.44*a* |

*a* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Sandy Creek near Caron, for 1915.

| Day. | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 0.165 | 0.56 | 0.130 | 0.39 | 0.190 | 0.70 | 0.210 | 0.81 | 0.115 | 0.33 |
| 2 | 0.150 | 0.49 | 0.125 | 0.37 | 0.215 | 0.84 | 0.210 | 0.81 | 0.115 | 0.33 |
| 3 | 0.140 | 0.44 | 0.155 | 0.51 | 0.200 | 0.75 | 0.220 | 0.87 | 0.160 | 0.54 |
| 4 | 0.140 | 0.44 | 0.155 | 0.51 | 0.190 | 0.70 | 0.220 | 0.87 | 0.145 | 0.46 |
| 5 | 0.135 | 0.42 | 0.150 | 0.49 | 0.190 | 0.70 | 0.220 | 0.87 | 0.155 | 0.51 |
| 6 | 0.130 | 0.39 | 0.155 | 0.51 | 0.240 | 0.99 | 0.215 | 0.84 | 0.160 | 0.54 |
| 7 | 0.110 | 0.31 | 0.155 | 0.51 | 0.225 | 0.90 | 0.215 | 0.84 | 0.160 | 0.54 |
| 8 | 0.110 | 0.31 | 0.155 | 0.51 | 0.215 | 0.84 | 0.215 | 0.84 | 0.160 | 0.54 |
| 9 | 0.110 | 0.31 | 0.155 | 0.51 | 0.215 | 0.84 | 0.205 | 0.78 | 0.150 | 0.49 |
| 10 | 0.135 | 0.42 | 0.160 | 0.54 | 0.215 | 0.84 | 0.205 | 0.78 | 0.150 | 0.49 |
| 11 | 0.200 | 0.75 | 0.165 | 0.56 | 0.205 | 0.78 | 0.205 | 0.78 | 0.150 | 0.49 |
| 12 | 0.135 | 0.42 | 0.190 | 0.70 | 0.205 | 0.78 | 0.190 | 0.70 | 0.150 | 0.49 |
| 13 | 0.130 | 0.39 | 0.190 | 0.70 | 0.205 | 0.78 | 0.160 | 0.54 | 0.145 | 0.46 |
| 14 | 0.128 | 0.39 | 0.190 | 0.70 | 0.205 | 0.78 | 0.160 | 0.54 | 0.140 | 0.44 |
| 15 | 0.115 | 0.33 | 0.190 | 0.70 | 0.205 | 0.78 | 0.170 | 0.59 | 0.130 | 0.39 |
| 16 | 0.120 | 0.35 | 0.183 | 0.66 | 0.210 | 0.81 | 0.190 | 0.70 | 0.130 | 0.39 |
| 17 | 0.258 | 1.10 | 0.183 | 0.66 | 0.210 | 0.81 | 0.190 | 0.70 | 0.130 | 0.39 |
| 18 | 0.203 | 0.77 | 0.193 | 0.71 | 0.210 | 0.81 | 0.200 | 0.75 | 0.130 | 0.39 |
| 19 | 0.180 | 0.64 | 0.183 | 0.66 | 0.210 | 0.81 | 0.190 | 0.70 | 0.130 | 0.39 |
| 20 | 0.175 | 0.62 | 0.183 | 0.66 | 0.200 | 0.75 | 0.190 | 0.70 | 0.120 | 0.35 |
| 21 | 0.165 | 0.56 | 0.178 | 0.63 | 0.205 | 0.78 | 0.190 | 0.70 | 0.135 | 0.42 |
| 22 | 0.150 | 0.49 | 0.178 | 0.63 | 0.210 | 0.81 | 0.185 | 0.67 | 0.135 | 0.42 |
| 23 | 0.145 | 0.46 | 0.155 | 0.51 | 0.210 | 0.81 | 0.185 | 0.67 | 0.130 | 0.39 |
| 24 | 0.140 | 0.44 | 0.157 | 0.52 | 0.210 | 0.81 | 0.185 | 0.67 | 0.130 | 0.39 |
| 25 | 0.140 | 0.44 | 0.210 | 0.81 | 0.210 | 0.81 | 0.180 | 0.64 | 0.135 | 0.42 |
| 26 | 0.140 | 0.44 | 0.195 | 0.72 | 0.210 | 0.81 | 0.155 | 0.51 | 0.140 | 0.44 |
| 27 | 0.165 | 0.56 | 0.195 | 0.72 | 0.210 | 0.81 | 0.150 | 0.49 | 0.140 | 0.44 |
| 28 | 0.155 | 0.51 | 0.215 | 0.84 | 0.210 | 0.81 | 0.145 | 0.46 | 0.140 | 0.44 |
| 29 | 0.145 | 0.46 | 0.200 | 0.75 | 0.210 | 0.81 | 0.145 | 0.46 | 0.140 | 0.44 |
| 30 | 0.140 | 0.44 | 0.195 | 0.72 | 0.210 | 0.81 | 0.115 | 0.33 | 0.140 | 0.44 |
| 31 | 0.120 | 0.35 | ..... | ..... | 0.210 | 0.81 | ..... | ..... | 0.140 | 0.44 |

MONTHLY DISCHARGE of Sandy Creek near Caron, for 1915.

(Drainage area 92 square miles.)

| MONTH. | DISCHARGE IN SECOND-FEET. | | | | RUN-OFF. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| August | 1.10 | 0.31 | 0.48 | 0.0052 | 0.006 | 29 |
| September | 0.84 | 0.37 | 0.61 | 0.0066 | 0.007 | 36 |
| October | 0.99 | 0.70 | 0.80 | 0.0087 | 0.010 | 49 |
| November | 0.87 | 0.33 | 0.69 | 0.0075 | 0.008 | 41 |
| December | 0.54 | 0.33 | 0.44 | 0.0048 | 0.006 | 27 |
| The period | ..... | ..... | ..... | ..... | 0.037 | 182 |

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Moosejaw Creek drainage basin, in 1915.

| Date. | Engineer. | Stream. | Location. | Width. | Area of Section. | Mean. Velocity. | Discharge. |
|---|---|---|---|---|---|---|---|
| | | | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Sec.-ft.* |
| June 16.... | F. K. Beach..... | Thunder Creek.... | Moosejaw..... | ..... | ..... | ..... | 0.01 |
| July 31.... | do ..... | do .... | do ..... | ..... | ..... | ..... | Nil. |
| June 23.... | do ..... | Moosejaw Creek. . | Sewage disposal plant..... | ..... | ..... | ..... | ..... *a* |

*a* Too small to measure.

## SOURIS RIVER DRAINAGE BASIN.

### *General Description.*

The source of the Souris River is in marshes near Yellow Grass, Saskatchewan. From here it flows in a southeasterly direction almost parallel to the Soo line of the Canadian Pacific Railway to Estevan. It then flows east to Oxbow; then it turns south and crosses the international boundary in Range 34, W. of principal Meridian. After making a loop into North Dakota, it recrosses the international boundary in Range 27, West of the 1st Meridian, and flows in a northeasterly direction to Souris, Manitoba, where it turns east, and finally joins the Assiniboine River, in Township 8, Range 16, West of the 1st Meridian.

The chief tributaries of Souris River are: Long Creek, which joins it near Estevan, Moose Mountain Creek near Oxbow, North and South Antler Creeks near Sourisford, Graham Creek at Melita and Pipestone Creek near Souris.

This stream drains a large tract of typical western plains. The rainfall will probably average very little over fifteen inches, and is usually sufficiently divided over the year to prevent excessive run-off or floods. At times when there is an unusual amount of rainfall, and in the early spring, the water drains into the streams very rapidly and causes a flood of short duration.

There are towns, villages, and farms all along the course of this stream and its tributaries, which depend on it for a domestic and industrial water supply. The Canadian Pacific Railway is a large consumer. The town of Estevan has established a water works system, and at Weyburn several dams store water from Souris River. In North Dakota it has been proposed to divert water for irrigation purposes.

The season of 1915 was noticeably deficient in precipitation over much of this drainage area. It is believed that no water ran into the dams at Weyburn during the year. The completion of drainage works in North Dakota during the year released some water previously accumulated in river flats in that state, and this appears in the run-off at Melita.

It is believed that North Antler or Gainsborough Creek discharged no water into Souris River, and that South Antler and Graham Creeks had a small discharge in 1915.

#### LONG CREEK NEAR ESTEVAN.

*Location.*—On the SE. ¼ Sec. 10, Tp. 2, Rge. 8, W. 2nd Mer., two and one-half miles south of the town of Estevan.

*Records available.*—June 22, 1911, to December 31, 1915.

*Gauge.*—Vertical staff at old section at bridge. Maintained at elevation 83.87 feet during 1911-12; at 83.90 feet in 1913, and at 83.87 feet in 1914-15. Vertical staff above weir used in winter time; zero of staff at elevation of crest. Vertical staff below a beaver dam used June 21, to November 16, 1915; zero elevation 83.20 feet.

*Bench-marks.*—Permanent iron bench-mark, near bridge at old section. Elevation assumed, 100.00 feet. Top of 3-inch stump on left bank 42 feet upstream from last gauge mentioned. Elevation, 93.15 feet.

*Channel.*—Permanent.

*Discharge measurements.*—By wading at new section or by weir.

*Winter flow.*—By two-foot rectangular weir.

*Observer.*—Geo. Pawson.

DISCHARGE MEASUREMENTS of Long Creek near Estevan, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 18 | F. R. Steinberger | ..... | ..... | ..... | ..... | 1.56*d* |
| Feb. 23 | E. W. W. Hughes | ..... | ..... | ..... | 0.32*a* | 1.16*d* |
| Mar. 9 | do | ..... | ..... | ..... | 0.35*a* | 1.33*d* |
| Mar. 24 | do | ..... | ..... | ..... | 0.54*a* | 2.50*d* |
| April 24 | do | ..... | ..... | ..... | 2.18*b* | 4.80*d* |
| June 21 | F. K. Beach | 2.3 | 1.15 | 0.85 | 0.96*c* | 0.98 |
| Aug. 9 | do | 2.3 | 1.13 | 0.54 | 0.89*c* | 0.61 |
| Aug. 31 | do | ..... | ..... | ..... | 0.82*c* | 0.11*d* |
| Oct. 1 | do | 2.3 | 1.08 | 0.48 | 0.97*c* | 0.52 |
| Nov. 16 | F. R. Steinberger | ..... | ..... | ..... | 0.27*a* | 0.91*d* |
| Dec. 6 | do | ..... | ..... | ..... | 0.24*a* | 0.76*d* |
| Dec. 21 | do | ..... | ..... | ..... | 0.23*a* | 0.72*d* |

*a* Weir gauge.
*b* Gauge at bridge.
*c* Gauge below beaver dam.
*d* Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Long Creek near Estevan, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 0.31*b* | 1.11 | 0.20 | 0.58 | 0.35 | 1.33 | 0.46 | 1.98 | 0.50 | 2.24 | 0.14 | 0.34 |
| 2 | 0.32 | 1.17 | 0.20 | 0.58 | 0.35 | 1.33 | 0.46 | 1.98 | 0.50 | 2.24 | 0.12 | 0.27 |
| 3 | 0.33 | 1.22 | 0.21 | 0.63 | 0.36 | 1.39 | 0.50 | 2.24 | 0.50 | 2.24 | 0.10 | 0.21 |
| 4 | 0.35 | 1.33 | 0.20 | 0.58 | 0.37 | 1.44 | 0.52 | 2.37 | 0.50 | 2.24 | 0.10 | 0.21 |
| 5 | 0.37 | 1.44 | 0.29 | 1.01 | 0.37 | 1.44 | 0.52 | 2.37 | 0.54 | 2.50 | 0.20 | 0.58 |
| 6 | 0.35 | 1.33 | 0.29 | 1.01 | 0.36 | 1.39 | 0.55 | 2.57 | 0.46 | 1.98 | 0.35 | 1.33 |
| 7 | 0.35 | 1.33 | 0.29 | 1.01 | 0.36 | 1.39 | 0.56 | 2.63 | 0.40 | 1.62 | 0.30 | 1.06 |
| 8 | 0.35 | 1.33 | 0.29 | 1.01 | 0.37 | 1.44 | ..... | 5.00 | 0.40 | 1.62 | 0.25 | 0.81 |
| 9 | 0.35 | 1.33 | 0.29 | 1.01 | 0.36 | 1.39 | 0.60*a* | 4.00 | 0.36 | 1.39 | 0.20 | 0.58 |
| 10 | 0.35 | 1.33 | 0.28 | 0.96 | 0.36 | 1.39 | 0.60*a* | 4.00 | 0.30 | 1.06 | 0.20 | 0.58 |
| 11 | 0.36 | 1.39 | 0.27 | 0.91 | ..... | 1.36 | 0.59*a* | 3.75 | 0.30 | 1.06 | 0.15 | 0.38 |
| 12 | 0.35 | 1.33 | 0.29 | 1.01 | 0.35 | 1.33 | 0.55*a* | 3.25 | 0.25 | 0.81 | 0.10 | 0.21 |
| 13 | 0.34 | 1.28 | 0.30 | 1.06 | 0.35 | 1.33 | 0.55*a* | 3.00 | 0.20 | 0.58 | 0.10*b* | 0.21 |
| 14 | 0.34 | 1.28 | 0.30 | 1.06 | 0.35 | 1.33 | 0.50*a* | 2.75 | 0.20 | 0.58 | 2.14*c* | 0.30 |
| 15 | 0.34 | 1.28 | 0.30 | 1.06 | 0.35 | 1.33 | 0.50*a* | 2.75 | 0.40 | 1.62 | 2.17 | 0.40 |
| 16 | 0.33 | 1.22 | 0.29 | 1.01 | 0.35 | 1.33 | 0.50*a* | 2.75 | 0.50 | 2.24 | 2.17 | 0.50 |
| 17 | 0.34 | 1.28 | 0.28 | 0.96 | 0.35 | 1.33 | 0.60*a* | 3.50 | 0.47 | 2.04 | 2.20 | 0.60 |
| 18 | 0.34 | 1.28 | 0.28 | 0.96 | 0.34 | 1.28 | 0.62*a* | 4.00 | 0.40 | 1.62 | 2.20 | 0.70 |
| 19 | 0.32 | 1.17 | 0.29 | 1.01 | 0.35 | 1.33 | 0.63*a* | 4.50 | 0.35 | 1.33 | 2.20 | 0.80 |
| 20 | 0.27 | 0.91 | 0.30 | 1.06 | 0.35 | 1.33 | 0.50*a* | 2.75 | 0.30 | 1.06 | 2.20*c* | 0.90 |
| 21 | 0.27 | 0.91 | 0.30 | 1.06 | 0.40 | 1.62 | 0.45*a* | 2.25 | 0.27 | 0.91 | 0.97*d* | 1.02 |
| 22 | 0.24 | 0.76 | 0.31 | 1.11 | 0.42 | 1.74 | 0.45*a* | 2.25 | 0.25 | 0.81 | 0.99 | 1.08 |
| 23 | 0.22*a* | 0.95 | 0.32 | 1.17 | 0.44 | 1.86 | 0.45*a* | 2.25 | 0.22 | 0.67 | 1.01 | 1.13 |
| 24 | 0.29 | 1.01 | 0.33 | 1.22 | 0.64*a* | 4.00 | 0.50*a* | 2.75 | 0.22 | 0.67 | 0.98 | 1.04 |
| 25 | 0.29 | 1.01 | 0.34 | 1.28 | 0.48*a* | 2.50 | 0.85*a* | 5.25 | 0.24 | 0.76 | 0.97 | 1.00 |
| 26 | 0.29 | 1.01 | 0.34 | 1.28 | 0.44*a* | 2.20 | 0.75 | 4.00 | 0.19 | 0.54 | 0.95 | 0.94 |
| 27 | 0.23 | 0.72 | 0.34 | 1.28 | 0.44 | 1.86 | 0.70 | 3.63 | 0.25 | 0.81 | 0.96 | 0.97 |
| 28 | 0.24 | 0.76 | ..... | 1.30 | 0.48 | 2.11 | 0.65 | 3.26 | 0.24 | 0.76 | 0.95 | 0.93 |
| 29 | 0.21 | 0.63 | ..... | ..... | 0.44 | 1.86 | 0.60 | 2.91 | 0.20 | 0.58 | 0.97 | 0.99 |
| 30 | 0.24 | 0.76 | ..... | ..... | 0.40 | 1.62 | 0.55 | 2.57 | 0.20 | 0.58 | 0.90*d* | 0.78 |
| 31 | 0.21 | 0.63 | ..... | ..... | 0.46 | 1.98 | ..... | ..... | 0.18 | 0.50 | ..... | ..... |

*a* Some water escaped around weir. Discharge estimated.
*b* to *b* Head on 2 foot weir.
*c* to *c* Gauge at bridge affected by beaver dam
*d* to *d* Shifting conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Long Creek near Estevan, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 0.92*b* | 0.83 | 0.93 | 0.76 | 0.82 | 0.10 | 0.97 | 0.53 | 1.00 | 0.62 | 0.24 | 0.76 |
| 2 | 0.93 | 0.86 | 0.88 | 0.60 | 0.76 | 0.02 | 0.95 | 0.47 | 0.98 | 0.56 | 0.24 | 0.76 |
| 3 | 0.95 | 0.92 | 0.88 | 0.60 | 0.77 | 0.03 | 0.95 | 0.47 | 1.00 | 0.62 | 0.24 | 0.76 |
| 4 | 0.97 | 0.97 | 0.85 | 0.52 | 0.78 | 0.04 | 0.95 | 0.47 | 1.01 | 0.66 | 0.25 | 0.81 |
| 5 | 0.98 | 1.00 | 0.87 | 0.57 | 0.84 | 0.15 | 0.94 | 0.44 | 1.01 | 0.66 | 0.23 | 0.72 |
| 6 | 0.93 | 0.84 | 0.89 | 0.63 | 0.81 | 0.09 | 0.95 | 0.47 | 1.02 | 0.70 | 0.24 | 0.76 |
| 7 | 0.93 | 0.84 | 0.88 | 0.60 | 0.83 | 0.12 | 0.95 | 0.47 | 1.05 | 0.80 | 0.25 | 0.81 |
| 8 | 0.93 | 0.84 | 0.88 | 0.60 | 0.84 | 0.15 | 0.95 | 0.47 | 1.15 | 1.17 | 0.26 | 0.86 |
| 8 | 0.93 | 0.84 | 0.88 | 0.60 | 0.86 | 0.20 | 0.95 | 0.47 | 1.14 | 1.13 | 0.27 | 0.91 |
| 10 | 1.02 | 1.12 | 0.86 | 0.52 | 0.84 | 0.15 | 0.96 | 0.50 | 1.14 | 1.13 | 0.29 | 1.01 |
| 11 | 1.08 | 1.32 | 0.85 | 0.48 | 0.86 | 0.20 | 0.94 | 0.44 | 1.10 | 0.98 | 0.25 | 0.81 |
| 12 | 1.20 | 1.80 | 0.84 | 0.44 | 0.89 | 0.29 | 0.95 | 0.47 | 1.08 | 0.91 | 0.25 | 0.81 |
| 13 | 1.15 | 1.58 | 0.83 | 0.39 | 0.89 | 0.29 | 0.96 | 0.50 | 1.06 | 0.84 | 0.22 | 0.67 |
| 14 | 1.05 | 1.20 | 0.85 | 0.42 | 0.91 | 0.35 | 0.98 | 0.56 | 1.05 | 0.80 | 0.18 | 0.50 |
| 15 | 1.03 | 1.13 | 0.81 | 0.30 | 0.93 | 0.41 | 0.98 | 0.56 | 1.05 | 0.80 | 0.20 | 0.58 |
| 16 | 1.01 | 1.06 | 0.79 | 0.23 | 0.94 | 0.44 | 0.97 | 0.53 | 1.05 | 0.80 | 0.17 | 0.46 |
| 17 | 1.00 | 1.03 | 0.77 | 0.18 | 0.95 | 0.47 | 0.96 | 0.50 | 0.28*a* | 0.96 | 0.18 | 0.50 |
| 18 | 1.03 | 1.12 | 0.76 | 0.14 | 0.97 | 0.53 | 0.97 | 0.53 | 0.34 | 1.28 | 0.18 | 0.50 |
| 19 | 1.00 | 1.02 | 0.84 | 0.32 | 0.93 | 0.41 | 0.96 | 0.50 | 0.34 | 1.28 | 0.19 | 0.54 |
| 20 | 0.98 | 0.95 | 0.84 | 0.31 | 0.91 | 0.35 | 0.96 | 0.50 | 0.34 | 1.28 | 0.22 | 0.67 |
| 21 | 0.97 | 0.92 | 0.84 | 0.29 | 0.85 | 0.18 | 0.96 | 0.50 | 0.30 | 1.06 | 0.23 | 0.72 |
| 22 | 0.93 | 0.79 | 0.85 | 0.30 | 0.91 | 0.35 | 0.96 | 0.50 | 0.30 | 1.06 | 0.24 | 0.76 |
| 23 | 0.95 | 0.85 | 0.83 | 0.24 | 0.90 | 0.32 | 0.97 | 0.53 | 0.28 | 0.96 | 0.26 | 0.86 |
| 24 | 0.96 | 0.87 | 0.87 | 0.32 | 0.90 | 0.32 | 0.96 | 0.50 | 0.30 | 1.06 | 0.25 | 0.81 |
| 25 | 0.94 | 0.81 | 0.84 | 0.23 | 0.91 | 0.35 | 0.95 | 0.47 | 0.30 | 1.06 | 0.23 | 0.72 |
| 26 | 0.93 | 0.78 | 0.87 | 0.30 | 0.91 | 0.35 | 0.97 | 0.53 | 0.30 | 1.06 | 0.23 | 0.72 |
| 27 | 0.93 | 0.78 | 0.84 | 0.21 | 0.91 | 0.35 | 0.99 | 0.59 | 0.30 | 1.06 | 0.25 | 0.81 |
| 28 | 0.95 | 0.84 | 0.85 | 0.22 | 0.93 | 0.41 | 0.99 | 0.59 | 0.29 | 1.01 | 0.24 | 0.76 |
| 29 | 0.93 | 0.77 | 0.88 | 0.28 | 0.93 | 0.41 | 1.00 | 0.62 | 0.28 | 0.96 | 0.25 | 0.81 |
| 30 | 0.94 | 0.80 | 0.85 | 0.17 | 0.99 | 0.59 | 1.00 | 0.62 | 0.24 | 0.76 | 0.25 | 0.81 |
| 31 | 0.93 | 0.76 | 0.83*b* | 0.12 | ..... | ..... | 1.00 | 0.62 | ..... | ..... | 0.25*a* | 0.81 |

*a* to *a* Head on 24-inch weir.
*b* to *b* Shifting conditions.

MONTHLY DISCHARGE of Long Creek near Estevan, for 1915.

(Drainage area 1,380 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 1.44 | 0.63 | 1.11 | 0.000805 | 0.0009 | 68 |
| February | 1.30 | 0.58 | 1.01 | 0.000732 | 0.0008 | 56 |
| March | 4.00 | 1.28 | 1.63 | 0.001181 | 0.0014 | 100 |
| April | 5.25 | 1.98 | 3.11 | 0.002254 | 0.0025 | 185 |
| May | 2.50 | 0.50 | 1.28 | 0.000928 | 0.0011 | 79 |
| June | 1.33 | 0.21 | 0.70 | 0.000507 | 0.0006 | 42 |
| July | 1.80 | 0.76 | 0.98 | 0.000710 | 0.0008 | 60 |
| August | 0.76 | 0.12 | 0.38 | 0.000275 | 0.0003 | 23 |
| September | 0.59 | 0.02 | 0.28 | 0.000203 | 0.0002 | 17 |
| October | 0.62 | 0.44 | 0.51 | 0.000370 | 0.0004 | 31 |
| November | 1.28 | 0.56 | 0.93 | 0.000674 | 0.0007 | 55 |
| December | 1.01 | 0.46 | 0.74 | 0.000536 | 0.0006 | 46 |
| The year | | | | | 0.0103 | 762 |

SOURIS RIVER NEAR ESTEVAN.

*Location.*—On the NE. ¼ Sec. 11, Tp. 2, Rge. 8, W. 2nd Mer., near the pumping plant of the Canadian Pacific Railway.

*Records available.*—June 23, 1911, to December 31, 1915.

*Gauge.*—Staff. Zero elevation of gauge was maintained at 82.45 feet during 1911–12; zero elevation of gauge was maintained at 82.55 feet during 1913–15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Subject to debris on control.

*Discharge measurements.*—From bridge about one mile upstream, by wading at gauge, or by weir.

*Winter flow.*—Affected by ice. Permanent weir used winter of 1914–15.

*Observer.*—W. Bevan.

DISCHARGE MEASUREMENTS of Souris River near Estevan, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean. Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Jan. 18 | F. R. Steinberger | ..... | ..... | ..... | ..... | 0.91*a* |
| Feb. 23 | E. W. W. Hughes | ..... | ..... | ..... | 0.99 | 0.58*a* |
| Mar. 9 | do | ..... | ..... | ..... | 1.09 | 0.96*a* |
| Mar. 24 | do | 12.3 | 8.20 | 0.45 | 1.70 | 3.80 |
| April 24 | do | 6.1 | 2.40 | 1.50 | 1.01 | 3.60 |
| June 21 | F. K. Beach | 8.0 | 1.62 | 0.47 | 0.66 | 0.76 |
| Aug. 9 | do | ..... | ..... | ..... | 0.60 | 0.33*a* |
| Aug. 31 | do | ..... | ..... | ..... | 0.49 | 0.01*a* |
| Oct. 1 | do | ..... | ..... | ..... | 0.47 | 0.05*a* |
| Nov. 15 | F. R. Steinberger | ..... | ..... | ..... | 0.50 | 0.04*a* |
| Nov. 16 | do | ..... | ..... | ..... | 0.06*b* | 0.05*a* |
| Dec. 6 | do | ..... | ..... | ..... | 0.64 | 0.74*a* |
| Dec. 21 | do | ..... | ..... | ..... | 0.76 | 0.76*a* |

*a* Weir measurement.
*b* Weir gauge.

DAILY GAUGE HEIGHT AND DISCHARGE of Souris River near Estevan, for 1915.

| Day. | January. | | February. | | March. | | April. | | May. | | June. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 0.28*a* | 0.96 | 0.33*a* | 1.22 | 0.28*a* | 0.96 | 2.00*b* | 2.60 | 0.96*b* | 3.00 | 0.76*b* | 1.18 |
| 2 | 0.28 | 0.96 | 0.33 | 1.22 | 0.29 | 1.01 | 1.90 | 2.10 | 0.96 | 3.00 | 0.76 | 1.18 |
| 3 | 0.29 | 1.01 | 0.33 | 1.22 | 0.28 | 0.96 | 1.90 | 2.20 | 0.92 | 2.50 | 0.76 | 1.18 |
| 4 | 0.29 | 1.01 | 0.33 | 1.22 | 0.28 | 0.96 | 1.92 | 2.30 | 0.90 | 2.30 | 0.76 | 1.18 |
| 5 | 0.29 | 1.01 | 0.33 | 1.22 | 0.27 | 0.91 | 1.92 | 2.40 | 0.88 | 2.10 | 0.84 | 1.76 |
| 6 | 0.28 | 0.96 | 0.33 | 1.22 | 0.29 | 1.01 | 1.95 | 2.60 | 0.88 | 2.10 | 0.89 | 2.20 |
| 7 | 0.30 | 1.06 | 0.38 | 1.50 | 0.30 | 1.06 | 1.96 | 2.70 | 0.86 | 1.90 | 0.91 | 2.40 |
| 8 | 0.30 | 1.06 | 0.38 | 1.50 | 0.30 | 1.06 | 1.96 | 2.80 | 0.86 | 1.90 | 0.81 | 1.50 |
| 9 | 0.30 | 1.06 | 0.38 | 1.50 | 0.28 | 0.96 | 1.96 | 2.00 | 0.85 | 1.84 | 0.81 | 1.50 |
| 10 | 0.31 | 1.11 | 0.65*a* | 2.80 | 0.28 | 0.96 | 1.96 | 3.00 | 0.85 | 1.84 | 0.78 | 1.30 |
| 11 | 0.30 | 1.06 | 1.96*b* | 5.60 | 0.27 | 0.91 | 1.94 | 2.90 | 0.86 | 1.90 | 0.78 | 1.30 |
| 12 | 0.30 | 1.06 | 2.00 | 5.90 | 0.25 | 0.81 | 1.94 | 3.00 | 0.86 | 1.90 | 0.78 | 1.30 |
| 13 | 0.30 | 1.06 | 1.80 | 4.45 | 0.25 | 0.81 | 1.90 | 2.90 | 0.86 | 1.90 | 0.73 | 1.00 |
| 14 | 0.31 | 1.11 | 1.72 | 3.90 | 0.25 | 0.81 | 1.90 | 3.00 | 0.86 | 1.90 | 0.70 | 0.82 |
| 15 | 0.31 | 1.11 | 1.60*b* | 3.20 | 0.25 | 0.81 | 1.90 | 3.00 | 0.87 | 2.00 | 0.67 | 0.70 |
| 16 | 0.30 | 1.06 | 0.50*a* | 2.24 | 0.25 | 0.81 | 1.90 | 3.10 | 0.87 | 2.00 | 0.65 | 0.60 |
| 17 | 0.30 | 1.06 | 0.43 | 1.80 | 0.40 | 1.62 | 1.90 | 3.20 | 0.90 | 2.30 | 0.65 | 0.60 |
| 18 | 0.29 | 1.01 | 0.36 | 1.39 | 0.45 | 1.92 | 1.91 | 3.30 | 0.90 | 2.30 | 0.62 | 0.47 |
| 19 | 0.29 | 1.01 | 0.30 | 1.06 | 0.48 | 2.11 | 1.92 | 3.40 | 0.92 | 2.50 | 0.62 | 0.47 |
| 20 | 0.29 | 1.01 | 0.27 | 0.91 | 0.50*a* | 2.24 | 1.92 | 3.50 | 0.85 | 1.84 | 0.65 | 0.60 |
| 21 | 0.29 | 1.01 | 0.27 | 0.91 | 1.50*b* | 2.56 | 1.90 | 3.40 | 0.85 | 1.84 | 0.66 | 0.65 |
| 22 | 0.28 | 0.96 | 0.27 | 0.91 | 1.56 | 2.93 | 1.92 | 3.60 | 0.85 | 1.84 | 0.67 | 0.69 |
| 23 | 0.28 | 0.96 | 0.26 | 0.86 | 1.60 | 3.18 | 1.90 | 3.50 | 0.85 | 1.84 | 0.67 | 0.69 |
| 24 | 0.28 | 0.96 | 0.26 | 0.86 | 1.68 | 3.60 | 1.90*c* | 3.60 | 0.86 | 1.90 | 0.65 | 0.60 |
| 25 | 0.28 | 0.96 | 0.25 | 0.81 | 1.70 | 3.80 | 1.02 | 3.80 | 0.85 | 1.84 | 0.66 | 0.65 |
| 26 | 0.28 | 0.96 | 0.25 | 0.81 | 1.70 | 3.80 | 1.00 | 3.50 | 0.85 | 1.84 | 0.66 | 0.65 |
| 27 | 0.28 | 0.96 | 0.25 | 0.81 | 1.65 | 3.50 | 1.00 | 3.50 | 0.82 | 1.58 | 0.66 | 0.65 |
| 28 | 0.28 | 0.96 | 0.25*a* | 0.81 | 1.65 | 3.50 | 0.98 | 3.20 | 0.80 | 1.42 | 0.65 | 0.60 |
| 29 | 0.28 | 0.96 | ..... | ..... | 1.58 | 3.00 | 0.96 | 3.00 | 0.78 | 1.30 | 0.65 | 0.60 |
| 30 | 0.28 | 0.96 | ..... | ..... | 1.50 | 2.56 | 0.96*b* | 3.00 | 0.77 | 1.24 | 0.70*b* | 0.82 |
| 31 | 0.28*a* | 0.96 | ..... | ..... | 1.50*b* | 2.56 | ..... | ..... | 0.77*b* | 1.24 | ..... | ..... |

*a* to *a* Head on 24-inch weir.
*b* to *b* Gauge height.
*c* Debris cleared from control after observation. Shifting conditions April 1 to 24.

DAILY GAUGE HEIGHT AND DISCHARGE of Souris River near Estevan, for 1915.—*Concluded.*

| Day. | July. | | August. | | September. | | October. | | November. | | December. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 0.70 | 0.82 | 0.60 | 0.39 | 0.48 | 0.01 | 0.47 | 0.05 | 0.48 | 0.04 | 0.64 | 0.75 |
| 2 | 0.70 | 0.82 | 0.59 | 0.36 | 0.49 | 0.01 | 0.47 | 0.05 | 0.49 | 0.04 | 0.64 | 0.75 |
| 3 | 0.71 | 0.88 | 0.58 | 0.32 | 0.49 | 0.01 | 0.48 | 0.06 | 0.49 | 0.04 | 0.64 | 0.75 |
| 4 | 0.69 | 0.78 | 0.55 | 0.22 | 0.49 | 0.01 | 0.48 | 0.06 | 0.49 | 0.04 | 0.64 | 0.75 |
| 5 | 0.68 | 0.73 | 0.55 | 0.22 | 0.49 | 0.01 | 0.47 | 0.05 | 0.49 | 0.04 | 0.64 | 0.75 |
| 6 | 0.68 | 0.73 | 0.55 | 0.22 | 0.49 | 0.01 | 0.47 | 0.05 | 0.49 | 0.04 | 0.64 | 0.74 |
| 7 | 0.70 | 0.82 | 0.55 | 0.22 | 0.50 | 0.05 | 0.46 | 0.01 | 0.49 | 0.04 | 0.63 | 0.70 |
| 8 | 0.70 | 0.82 | 0.55 | 0.22 | 0.50 | 0.05 | 0.46 | 0.01 | 0.49 | 0.04 | 0.63 | 0.70 |
| 9 | 0.68 | 0.73 | 0.60 | 0.39 | 0.50 | 0.05 | 0.46 | 0.01 | 0.49 | 0.04 | 0.62 | 0.65 |
| 10 | 1.30 | 8.90 | 0.60 | 0.39 | 0.50 | 0.05 | 0.46 | 0.01 | 0.49 | 0.04 | 0.61 | 0.60 |
| 11 | 0.90 | 2.26 | 0.60 | 0.39 | 0.50 | 0.05 | 0.47 | 0.05 | 0.49 | 0.04 | 0.61 | 0.60 |
| 12 | 0.86 | 1.92 | 0.60 | 0.39 | 0.50 | 0.05 | 0.47 | 0.05 | 0.49 | 0.04 | 0.61 | 0.60 |
| 13 | 0.80 | 1.42 | 0.60 | 0.39 | 0.50 | 0.05 | 0.47 | 0.05 | 0.50 | 0.04 | 0.62 | 0.65 |
| 14 | 0.76 | 1.18 | 0.60 | 0.39 | 0.50 | 0.05 | 0.47 | 0.05 | 0.50 | 0.04 | 0.65 | 0.70 |
| 15 | 0.76 | 1.18 | 0.60 | 0.39 | 0.50 | 0.05 | 0.47 | 0.05 | 0.50 | 0.04 | 0.67 | 0.75 |
| 16 | 0.77 | 1.24 | 0.60 | 0.39 | 0.50 | 0.05 | 0.47 | 0.05 | 0.60 | 0.05*a* | 0.70 | 0.75 |
| 17 | 0.65 | 0.60 | 0.60 | 0.39 | 0.50 | 0.05 | 0.47 | 0.05 | 0.64 | 0.74*b* | 0.76 | 0.75 |
| 18 | 0.70 | 0.82 | 0.60 | 0.39 | 0.51 | 0.05 | 0.47 | 0.05 | 0.66 | 0.82 | 0.76 | 0.75 |
| 19 | 0.75 | 1.12 | 0.65 | 0.60 | 0.53 | 0.05 | 0.47 | 0.05 | 0.68 | 0.90 | 0.76 | 0.75 |
| 20 | 0.75 | 1.12 | 0.65 | 0.60 | 0.53 | 0.05 | 0.48 | 0.05 | 0.70 | 1.00 | 0.76 | 0.75 |
| 21 | 0.75 | 1.12 | 0.60 | 0.39 | 0.53 | 0.05 | 0.48 | 0.05 | 0.71 | 1.05 | 0.76 | 0.76 |
| 22 | 0.75 | 1.12 | 0.58 | 0.32 | 0.52 | 0.05 | 0.48 | 0.05 | 0.69 | 0.95 | 0.76 | 0.75 |
| 23 | 0.75 | 1.12 | 0.59 | 0.36 | 0.52 | 0.05 | 0.48 | 0.05 | 0.68 | 0.90 | 0.76 | 0.75 |
| 24 | 0.75 | 1.12 | 0.54 | 0.19 | 0.56 | 0.05 | 0.48 | 0.05 | 0.68 | 0.90 | 0.76 | 0.75 |
| 25 | 0.65 | 0.60 | 0.50 | 0.05*a* | 0.56 | 0.05 | 0.47 | 0.05 | 0.67 | 0.85 | 0.76 | 0.75 |
| 26 | 0.65 | 0.60 | 0.50 | 0.05 | 0.57 | 0.05 | 0.47 | 0.05 | 0.69 | 0.95 | 0.78 | 0.75 |
| 27 | 0.65 | 0.60 | 0.50 | 0.05 | 0.57 | 0.05 | 0.47 | 0.05 | 0.67 | 0.85 | 0.80 | 0.75 |
| 28 | 0.63 | 0.52 | 0.50 | 0.05 | 0.57 | 0.05 | 0.47 | 0.05 | 0.67 | 0.85 | 0.81 | 0.75 |
| 29 | 0.63 | 0.52 | 0.50 | 0.05 | 0.58 | 0.05 | 0.47 | 0.05 | 0.66 | 0.80 | 0.81 | 0.75 |
| 30 | 0.63 | 0.52 | 0.49 | 0.01 | 0.58 | 0.05 | 0.47 | 0.05 | 0.66 | 0.80 | 0.79 | 0.75 |
| 31 | 0.62*b* | 0.47 | 0.49 | 0.01 | ..... | ..... | 0.48 | 0.05 | ..... | ..... | 0.79 | 0.75*b* |

*a* to *a* Seepage under dam is all that passed gauge.
*b* to *b* Ice conditions.

MONTHLY DISCHARGE of Souris River near Estevan, for 1915.

(Drainage area 4,550 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| January | 1.11 | 0.96 | 1.01 | .000222 | .0003 | 62 |
| February | 5.90 | 0.81 | 1.85 | .000407 | .0004 | 103 |
| March | 3.80 | 0.81 | 1.86 | .000410 | .0005 | 114 |
| April | 3.80 | 2.10 | 3.00 | .000660 | .0007 | 179 |
| May | 3.00 | 1.24 | 1.96 | .000430 | .0005 | 120 |
| June | 2.40 | 0.47 | 0.99 | .000218 | .0002 | 59 |
| July | 8.90 | 0.47 | 1.20 | .000264 | .0003 | 74 |
| August | 0.60 | 0.01 | 0.28 | .000061 | .0001 | 17 |
| September | 0.05 | 0.01 | 0.04 | .000009 | .0000 | 2 |
| October | 0.06 | 0.01 | 0.05 | .000011 | .0000 | 3 |
| November | 1.05 | 0.04 | 0.43 | .000094 | .0001 | 26 |
| December | 0.76 | 0.60 | 0.72 | .000158 | .0002 | 44 |
| The year | | ..... | ... | | .0033 | 803 |

MOOSE MOUNTAIN CREEK NEAR OXBOW.

*Location.*—On the NE. ¼ Sec. 15, Tp. 3, Rge. 2, W. 2nd Mer., one mile south and one-half mile west of the Canadian Pacific Railway station at Oxbow.

*Records available.*—September 4, 1913, to October 31, 1915.

*Gauge.*—Vertical staff. Zero elevation, 91.94 feet from establishment until August 23, 1915, sometimes affected by backwater from Souris River. Vertical staff. Zero elevation, 92.31 feet August 24, 1915, to October 31, 1915.

*Bench-marks.*—On stump of tree, fifty feet upstream from first gauge, painted white. Assumed elevation, 100.00 feet. Spike in tree on right bank at second gauge. Elevation, 98.84 feet.

*Channel.*—Permanent.

*Discharge measurements.*—By wading near first gauge or from bridge one-quarter mile upstream.

*Winter flow.*—No winter observations have been taken.

*Observer.*—W. E. Christmas.

DISCHARGE MEASUREMENTS of Moose Mountain Creek near Oxbow, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 25 | E. W. W. Hughes | ..... | ..... | ..... | ..... | Nil. |
| April 27 | do | 25.5 | 12.20 | 0.81 | 1.29 | 9.90 |
| June 18 | F. K. Beach | 16.0 | 6.30 | 1.61 | 1.22 | 10.20 |
| Aug. 10 | do | 2.0 | 0.27 | 0.20 | 0.91 | 0.05 |
| Sept. 1, 2 | do | ..... | ..... | ..... | 0.47<br>0.68*a* | 0.01 |
| Oct. 2 | do | ..... | ..... | ..... | 0.64*a* | 0.00*b* |

*a* New gauge.
*b* Small flow, too small to measure.

DAILY GAUGE HEIGHT AND DISCHARGE of Moose Mountain Creek near Oxbow, for 1915.

| Day. | March. | | April. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | Nil. | 0.95 | 1.00 |
| 2 | ..... | " | 1.06 | 2.00 |
| 3 | ..... | " | 1.10 | 3.00 |
| 4 | ..... | " | 1.03 | 3.00 |
| 5 | ..... | " | 1.04 | 4.00 |
| 6 | ..... | " | 1.03 | 5.00*a* |
| 7 | ..... | " | 1.03 | 5.90 |
| 8 | ..... | " | 1.12 | 7.40 |
| 9 | ..... | " | 1.15 | 7.90 |
| 10 | ..... | " | 1.14 | 7.70 |
| 11 | ..... | " | 1.45 | 15.50 |
| 12 | ..... | " | 1.45 | 15.50 |
| 13 | ..... | " | 1.38 | 13.20 |
| 14 | ..... | " | 1.36 | 12.70 |
| 15 | ..... | " | 1.39 | 13.50 |
| 16 | ..... | " | 1.40 | 13.80 |
| 17 | ..... | " | 1.35 | 12.40 |
| 18 | ..... | " | 1.34 | 12.10 |
| 19 | ..... | " | 1.35 | 12.40 |
| 20 | ..... | " | 1.30 | 11.00 |
| 21 | ..... | " *b* | 1.33 | 11.80 |
| 22 | 1.82 | 1.00*a* | 1.27 | 10.30 |
| 23 | 1.62 | 1.00 | 1.26 | 10.10 |
| 24 | 1.42 | Nil. | 1.30 | 11.00 |
| 25 | 1.42 | " | 1.31 | 11.30 |
| 26 | 1.18 | " | 1.29 | 10.80 |
| 27 | 1.28 | 0.50 | 1.28 | 10.60 |
| 28 | 1.21 | Nil. | 1.23 | 9.50 |
| 29 | 1.23 | " | 1.22 | 9.20 |
| 30 | 0.95 | " | 1.20 | 8.80 |
| 31 | 0.85 | " | ..... | ..... |

*a* to *a* Ice conditions.
*b* Observer reports no flow previous to this date.

DAILY GAUGE HEIGHT AND DISCHARGE of Moose Mountain Creek near Oxbow, for 1915.
—*Concluded.*

| Day. | May. | | June. | | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.19 | 8.60 | 1.03 | 5.90 | 1.00 | 5.40 | 1.05 | 4.20 | 0.70 | 0.01 | 0.65 | 0.01 |
| 2 | 1.15 | 7.90 | 1.01 | 5.60 | 0.96 | 4.80 | ..... | 3.70 | 0.69 | 0.01 | 0.64 | 0.00 |
| 3 | 1.14 | 7.70 | 1.00 | 5.40 | 0.97 | 5.00 | 1.03 | 3.20 | 0.68 | 0.01 | 0.64 | 0.00 |
| 4 | 1.13 | 7.50 | 1.10 | 7.00 | 0.94 | 4.60 | 1.01 | 2.70 | 0.68 | 0.01 | 0.64 | 0.00 |
| 5 | 1.13 | 7.50 | 1.26 | 10.10 | 0.87 | 3.60 | 0.98 | 2.20 | 0.68 | 0.01 | 0.63 | 0.00 |
| 6 | 1.12 | 7.40 | 1.21 | 9.00 | 0.83 | 3.20 | 0.97 | 1.70 | 0.68 | 0.01 | 0.62 | 0.00 |
| 7 | 1.16 | 8.10 | 1.21 | 9.00 | 0.79 | 2.70 | 0.97 | 1.20 | 0.68 | 0.01 | 0.62 | 0.01 |
| 8 | 1.16 | 8.10 | 1.18 | 8.40 | 0.83 | 3.20 | 0.95 | 0.70 | 0.68 | 0.01 | 0.62 | Nil. |
| 9 | 1.14 | 7.70 | 1.16 | 8.10 | 0.89 | 3.90 | 0.94 | 0.20 | 0.68 | 0.01 | 0.62 | " |
| 10 | 1.21 | 9.00 | 1.26 | 10.10 | 1.07 | 6.50 | 0.92 | 0.05 | 0.68 | 0.01 | 0.62 | " |
| 11 | 1.14 | 7.70 | 1.25 | 9.90 | 1.34 | 12.10 | 0.90 | 0.04 | 0.67 | 0.01 | 0.62 | " |
| 12 | 1.13 | 7.50 | 1.24 | 9.70 | 1.26 | 10.10 | 0.90 | 0.04 | 0.68 | 0.01 | 0.62 | " |
| 13 | 1.15 | 7.90 | 1.21 | 9.00 | 1.50 | 17.20 | 0.88 | 0.04 | 0.69 | 0.01 | 0.61 | " |
| 14 | 1.15 | 7.90 | 1.21 | 9.00 | 1.35 | 12.40 | 0.87 | 0.04 | 0.69 | 0.01 | 0.61 | " |
| 15 | 1.27 | 10.30 | 1.22 | 9.20 | 1.29 | 10.80 | 0.86 | 0.04 | 0.69 | 0.01 | 0.61 | " |
| 16 | 1.28 | 10.60 | 1.25 | 9.90 | 1.30 | 11.00 | 0.80 | 0.03 | 0.68 | 0.01 | 0.61 | " |
| 17 | 1.27 | 10.30 | 1.22 | 9.20 | 1.41 | 14.10 | 0.77 | 0.03 | 0.67 | 0.01 | 0.61 | " |
| 18 | 1.23 | 9.50 | 1.20 | 8.80 | 1.39 | 13.50 | 0.75 | 0.03 | 0.66 | 0.01 | 0.61 | " |
| 19 | 1.24 | 9.70 | 1.19 | 8.60 | 1.34 | 12.10 | 0.71 | 0.03 | 0.66 | 0.00 | 0.61 | " |
| 20 | 1.24 | 9.70 | 1.20 | 8.80 | 1.30 | 11.00 | 0.75 | 0.03 | 0.66 | 0.00 | 0.61 | " |
| 21 | 1.22 | 9.20 | 1.22 | 9.20 | 1.25 | 9.90 | 0.73 | 0.02 | 0.66 | 0.01 | 0.61 | " |
| 22 | 1.19 | 8.60 | 1.15 | 7.90 | 1.25 | 9.90 | 0.72 | 0.02 | 0.65 | 0.00 | 0.61 | " |
| 23 | 1.17 | 8.30 | 1.17 | 8.30 | 1.29 | 10.80 | 0.69*a* | 0.02 | 0.65 | 0.00 | 0.61 | " |
| 24 | 1.17 | 8.30 | 1.18 | 8.40 | 1.16 | 8.10 | 0.71*b* | 0.02 | 0.65 | 0.00 | 0.61 | " |
| 25 | 1.16 | 8.10 | 1.15 | 7.90 | 1.15 | 7.90 | 0.71 | 0.02 | 0.65 | 0.00 | 0.61 | " |
| 26 | 1.11 | 7.20 | 1.25 | 9.90 | 1.11*a* | 7.20 | 0.70 | 0.01 | 0.65 | 0.00 | 0.61 | " |
| 27 | 1.17 | 8.30 | 1.16 | 8.10 | 1.10 | 6.70 | 0.70 | 0.01 | 0.65 | 0.01 | 0.60 | " |
| 28 | 1.17 | 8.30 | 1.08 | 6.70 | 1.08 | 6.20 | 0.71 | 0.02 | 0.65 | 0.00 | 0.60 | " |
| 29 | 1.12 | 7.40 | 1.07 | 6.50 | 1.08 | 5.70 | 0.70 | 0.01 | 0.65 | 0.00 | 0.60 | " |
| 30 | 1.12 | 7.40 | 1.03 | 5.90 | 1.07 | 5.20 | 0.69 | 0.01 | 0.65 | 0.00 | 0.60 | " |
| 31 | 1.09 | 6.80 | ..... | ..... | 1.07 | 4.70 | 0.69 | 0.01 | ..... | ..... | 0.60*b* | " |

*a* to *a* Affected by backwater from Souris River, caused by dam.
*b* to *b* New gauge not affected by backwater.

MONTHLY DISCHARGE of Moose Mountain Creek near Oxbow, for 1915.

(Drainage area 2,953 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area | Total in Acre-feet |
| March | 1.00 | Nil. | 0.08 | .00003 | .0000 | 3 |
| April | 15.50 | 1.00 | 9.40 | .00318 | .0036 | 539 |
| May | 10.60 | 6.80 | 8.30 | .00280 | .0032 | 510 |
| June | 10.10 | 5.40 | 8.30 | .00280 | .0031 | 494 |
| July | 17.20 | 2.70 | 8.00 | .00270 | .0031 | 492 |
| August | 4.20 | 0.01 | 0.66 | .00220 | .0003 | 41 |
| September | 0.01 | 0.00 | 0.01 | .00000 | .0000 | Nil |
| October | 0.01 | Nil | 0.00 | .00000 | .0000 | " |
| The period | | | | | .0133 | 2,101 |

NOTE.—It is believed that no discharge occurred in January or February.

SOURIS RIVER NEAR GLEN EWEN.

*Location.*—On the NE. ¼ Sec. 36, Tp. 2, Rge. 1, W. 2nd Mer., two miles south and one mile east of Canadian Pacific Railway station at Glen Ewen.

*Records available.*—June 26, 1911, to October 31, 1915.

*Gauge.*—Vertical staff. Zero maintained at elevation of 79.32 feet during 1911, and at 78.98 feet during 1912–15.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Affected by beaver dams and debris on control.

*Discharge measurements.*—By wading at ford, one-quarter mile below gauge or from bridge one mile above gauge.

*Winter flow.*—No observations have been taken.

*Observer.*—D. F. Preston.

DISCHARGE MEASUREMENTS of Souris River near Glen Ewen, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| Mar. 25 | E. W. W. Hughes | ..... | ..... | ..... | 2.32 | Nil. |
| April 26 | do | 50.0 | 35.0 | 0.57 | 1.95 | 19.90 |
| June 18 | F. K. Beach | 42.5 | 27.0 | 0.59 | 2.03 | 16.20 |
| Aug. 10 | do | 15.7 | 5.0 | 0.74 | 1.62 | 3.70 |
| Sept. 1 | do | 15.2 | 3.2 | 0.33 | 1.51 | 1.05 |
| Oct. 2 | do | 35.0 | 14.0 | 0.08 | 1.67 | 1.06 |

DAILY GAUGE HEIGHT AND DISCHARGE of Souris River near Glen Ewen, for 1915.

| Day. | March. | | April. | |
|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | ..... | Nil. | 2.12 | 1.00 |
| 2 | ..... | " | 2.05 | 1.00 |
| 3 | ..... | " | 2.05 | 1.00 |
| 4 | ..... | " | 2.09 | 1.50 |
| 5 | ..... | " | 2.11 | 2.00 |
| 6 | ..... | " | 2.12 | 2.50 |
| 7 | ..... | " | 2.14 | 3.00 |
| 8 | ..... | " | 2.19 | 5.00 |
| 9 | ..... | " | 2.25 | 7.00 |
| 10 | ..... | " | 2.19 | 10.00 |
| 11 | ..... | " | 2.02*a* | 20.00 |
| 12 | ..... | " | 2.08 | 25.00 |
| 13 | ..... | " | 2.22 | 41.00 |
| 14 | ..... | " | 2.24 | 44.00 |
| 15 | ..... | " | 2.12 | 29.00 |
| 16 | ..... | " | 2.01 | 19.60 |
| 17 | ..... | " | 2.02 | 20.00 |
| 18 | ..... | " | 2.01 | 19.60 |
| 19 | ..... | " | 1.99 | 18.20 |
| 20 | ..... | " *b* | 1.97 | 17.20 |
| 21 | 2.14*a* | 0.10 | 1.97 | 17.20 |
| 22 | 2.34 | 0.20 | 1.96 | 16.60 |
| 23 | 2.28 | 0.10 | 1.94 | 15.50 |
| 24 | 2.29 | Nil. | 1.93 | 15.00 |
| 25 | 2.31 | " | 1.94 | 15.50 |
| 26 | 2.30 | " | 1.95 | 16.00 |
| 27 | 2.38 | 1.00 | 1.95 | 16.00 |
| 28 | 2.36 | 1.00 | 1.92 | 14.40 |
| 29 | 2.34 | 1.00 | 1.89 | 12.90 |
| 30 | 2.34 | 1.00 | 1.88 | 12.50 |
| 31 | 2.19 | 1.00 | ..... | ..... |

*a* to *a* Ice conditions.
*b* Observer reports no flow previous to this date.

DAILY GAUGE HEIGHT AND DISCHARGE of Souris River near Glen Ewen, for 1915.—*Concluded.*

| Day. | May. | | June. | | July. | | August. | | September. | | October. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 1.89 | 12.90 | 1.87 | 12.10 | 1.86 | 11.70 | 1.79 | 9.00 | 1.52 | 1.05 | 1.66 | 1.06 |
| 2 | 1.87 | 12.10 | 1.85 | 11.30 | 1.85 | 11.30 | 1.77 | 8.30 | 1.52 | 1.05 | 1.66 | 1.06 |
| 3 | 1.86 | 11.70 | 1.83 | 10.50 | 1.84 | 10.90 | 1.75 | 7.60 | 1.53 | 1.05 | 1.70 | 1.06 |
| 4 | 1.84 | 10.90 | 1.91 | 13.80 | 1.83 | 10.50 | 1.73 | 7.00 | 1.54 | 1.05 | 1.70 | 1.06 |
| 5 | 1.82 | 10.10 | 1.89 | 12.90 | 1.80 | 9.30 | 1.70 | 6.00 | 1.55 | 1.05 | 1.70 | 1.06 |
| 6 | 1.82 | 10.10 | 1.91 | 13.80 | 1.82 | 10.10 | 1.69 | 5.70 | 1.55 | 1.05 | 1.72 | 1.06 |
| 7 | 1.80 | 9.30 | 1.98 | 17.70 | 1.78 | 8.60 | 1.67 | 5.20 | 1.56 | 1.05 | 1.73 | 1.06 |
| 8 | 1.79 | 9.00 | 1.96 | 16.60 | 1.84 | 10.90 | 1.65 | 4.60 | 1.57 | 1.05 | 1.74 | 1.06 |
| 9 | 1.80 | 9.30 | 2.00 | 18.80 | 1.78 | 8.60 | 1.63 | 4.10 | 1.57 | 1.05 | 1.74 | 1.06 |
| 10 | 1.84 | 10.90 | 2.00 | 18.80 | 1.74 | 7.30 | 1.62 | 3.80 | 1.57 | 1.05 | 1.75 | 1.06 |
| 11 | 1.84 | 10.90 | 2.01 | 19.60 | 1.71 | 6.30 | 1.61 | 3.60 | 1.56 | 1.05 | 1.75 | 1.06 |
| 12 | 1.86 | 11.70 | 2.02 | 20.00 | 1.75 | 7.60 | 1.60 | 3.30 | 1.58 | 1.05 | 1.75 | 1.06 |
| 13 | 1.84 | 10.90 | 2.03 | 21.00 | 1.89 | 12.90 | 1.60 | 3.30 | 1.61 | 1.05 | 1.76 | 1.06 |
| 14 | 1.81 | 9.70 | 1.97 | 17.20 | 2.51 | 92.00 | 1.58 | 2.80 | 1.63 | 1.05 | 1.77 | 1.06 |
| 15 | 1.90 | 13.30 | 1.94 | 15.50 | 2.36 | 63.00 | 1.57 | 2.60 | 1.60 | 1.05 | 1.78 | 1.06 |
| 16 | 1.93 | 15.00 | 1.96 | 16.60 | 2.35 | 61.00 | 1.56 | 2.30 | 1.59 | 1.05 | 1.79 | 1.06 |
| 17 | 1.98 | 17.70 | 1.96 | 16.60 | 2.25 | 45.00 | 1.56 | 2.30 | 1.58 | 1.05 | 1.79 | 1.06 |
| 18 | 1.97 | 17.20 | 2.03 | 21.00 | 2.30 | 52.00 | 1.56 | 2.30 | 1.56 | 1.05 | 1.79 | 1.06 |
| 19 | 1.95 | 16.00 | 2.03 | 21.00 | 2.37 | 64.00 | 1.56 | 2.30 | 1.55 | 1.05 | 1.81 | 1.06 |
| 20 | 1.93 | 15.00 | 2.05 | 23.00 | 2.34 | 59.00 | 1.62 | 3.80 | 1.56 | 1.05 | 1.83 | 1.06 |
| 21 | 1.96 | 16.60 | 2.00 | 18.80 | 2.29 | 51.00 | 1.62 | 3.80 | 1.57 | 1.05 | 1.90 | 1.06 |
| 22 | 1.95 | 16.00 | 2.05 | 23.00 | 2.10 | 27.00 | 1.62 | 3.80 | 1.57 | 1.05 | 1.91 | 1.06 |
| 23 | 1.93 | 15.00 | 2.03 | 21.00 | 2.06 | 24.00 | 1.61 | 3.60 | 1.56 | 1.05 | 1.81 | 1.06 |
| 24 | 1.91 | 13.80 | 1.99 | 18.20 | 2.03 | 21.00 | 1.60 | 3.30 | 1.60 | 1.06 | 1.82 | 1.06 |
| 25 | 1.88 | 12.50 | 1.95 | 16.00 | 2.00 | 18.80 | 1.56 | 2.30 | 1.61 | 1.06 | 1.84 | 1.06 |
| 26 | 1.87 | 12.10 | 2.04 | 22.00 | 1.96 | 16.60 | 1.55 | 2.00 | 1.63 | 1.06 | 1.85 | 1.06 |
| 27 | 1.91 | 13.80 | 2.03 | 21.00 | 1.92 | 14.40 | 1.55 | 2.00 | 1.65 | 1.06 | 1.86 | 1.06 |
| 28 | 1.90 | 13.30 | 2.01 | 19.60 | 1.94 | 15.50 | 1.54 | 1.80 | 1.66 | 1.06 | 1.85 | 1.06 |
| 29 | 1.93 | 15.00 | 1.97 | 17.20 | 1.95 | 16.00 | 1.52 | 1.30*a* | 1.66 | 1.06 | 1.85 | 1.06 |
| 30 | 1.92 | 14.40 | 1.90 | 13.30 | 1.86 | 11.70 | 1.52 | 1.20 | 1.65 | 1.06 | 1.85 | 1.06 |
| 31 | 1.87 | 12.10 | ..... | ..... | 1.80 | 9.30 | 1.52 | 1.10 | .... | ..... | 1.86 | 1.06*a* |

*a* to *a* Seepage only from dam at Oxbow. Fluctuations of gauge height due to leaves on control and to beavers.

MONTHLY DISCHARGE of Souris River near Glen Ewen, for 1915.

(Drainage area 7,500 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| March | 1.00 | Nil. | 0.17 | 0.00002 | 0.0000 | 10 |
| April | 44.00 | 1.00 | 14.60 | 0.00195 | 0.0022 | 869 |
| May | 17.70 | 9.00 | 12.80 | 0.00171 | 0.0020 | 787 |
| June | 23.00 | 10.50 | 17.60 | 0.00235 | 0.0026 | 1,047 |
| July | 92.00 | 6.30 | 25.00 | 0.00333 | 0.0038 | 1,537 |
| August | 9.00 | 1.10 | 3.70 | 0.00049 | 0.0006 | 203 |
| September | 1.06 | 1.05 | 1.05 | 0.00014 | 0.0002 | 62 |
| October | 1.06 | 1.06 | 1.06 | 0.00014 | 0.0002 | 65 |
| The period | | | | | 0.0116 | 4,580 |

NOTE.—It is believed that there was no discharge during January or February.

SOURIS RIVER AT MELITA.

*Location.*—On the SW. ¼ Sec. 6, Tp. 4, Rge. 26, W. 1st Mer., at a highway bridge in a park, about one mile east of the Canadian Pacific Railway station at Melita.

*Records available.*—July 20, 1911, to July 31, 1915.

*Gauge.*—Vertical staff. Elevation of zero maintained at 84.45 feet since establishment.

*Bench-mark.*—Permanent iron bench-mark. Assumed elevation, 100.00 feet.

*Channel.*—Permanent.

*Discharge measurements.*—With meter from bridge, or in times of very low water at a shallow section one thousand feet south of bridge and about one mile upstream by river.

*Winter flow.*—No records have been taken.

*Observer.*—W. Kay.

*Other records.*—A station has been established by the Manitoba Hydrographic Surveys at this point and records have been continued by them, since the discontinuance by this office of this station. Zero of their gauge elevation 84.44 feet (our datum), referred to iron benchmark 58 feet upstream from left end of bridge; elevation 98.86 feet (our datum), and to a benchmark, spike in stump, 69 feet upstream from right end of bridge, elevation 98.01 feet (our datum).

DISCHARGE MEASUREMENTS of Souris River at Melita, in 1915.

| Date. | Engineer. | Width. | Area of Section. | Mean Velocity. | Gauge Height. | Discharge. |
|---|---|---|---|---|---|---|
| | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Feet.* | *Sec.-ft.* |
| April 27 | E. W. W. Hughes | 82.0 | 172 | 0.59 | 1.92 | 102 |
| June 19 | F. K. Beach | 88.0 | 209 | 0.60 | 2.34 | 126 |
| Sept. 2 | do | 42.3*a* | 39 | 0.35 | 0.93 | 14 |

*a* Measurement made 1 mile upstream.

DAILY GAUGE HEIGHT AND DISCHARGE of Souris River at Melita, for 1915.

| DAY. | April. | | May. | | June. | | July. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 2.36 | 133 | 1.61 | 64 | 0.91 | 15.5 | 0.85 | 13.0 |
| 2 | 2.61 | 159 | 1.64 | 67 | 0.81 | 11.4 | 0.80 | 11.0 |
| 3 | 2.76 | 176 | 1.41 | 49 | 0.66 | 5.8 | 0.72 | 7.8 |
| 4 | 2.96 | 199 | 1.51 | 56 | 0.78 | 10.2 | 0.68 | 6.4 |
| 5 | 3.26 | 237 | 1.24 | 37 | 0.71 | 7.4 | 0.56 | 3.2 |
| 6 | 3.31 | 243 | 1.22 | 35 | 0.69 | 6.7 | 1.50 | 55.0 |
| 7 | 3.33 | 246 | 1.20 | 34 | 0.68 | 6.4 | 1.52 | 57.0 |
| 8 | 3.36 | 250 | 1.48 | 54 | 0.71 | 7.4 | 1.55 | 59.0 |
| 9 | 3.22 | 232 | 1.61 | 64 | 0.56 | 3.2 | 1.60 | 63.0 |
| 10 | 2.96 | 199 | 1.76 | 77 | 0.51 | 2.2 | 1.58 | 61.0 |
| 11 | 2.86 | 187 | 1.36 | 45 | 0.56 | 3.2 | 1.45 | 52.0 |
| 12 | 2.91 | 193 | 1.64 | 67 | 0.66 | 5.8 | 1.37 | 46.0 |
| 13 | 2.76 | 176 | 1.71 | 73 | 0.56 | 3.2 | 1.28 | 40.0 |
| 14 | 2.56 | 154 | 1.92 | 92 | 0.61 | 4.3 | 1.29 | 40.0 |
| 15 | 2.20 | 117 | 1.50 | 55 | 0.76 | 9.4 | 1.12 | 28.0 |
| 16 | 1.65 | 67 | 1.91 | 91 | 0.80 | 11.0 | 1.15 | 30.0 |
| 17 | 2.04 | 103 | 1.81 | 82 | 0.86 | 13.4 | 1.18 | 33.0 |
| 18 | 1.86 | 86 | 1.90 | 90 | 2.81 | 181.0 | 1.16 | 31.0 |
| 19 | 1.65 | 67 | 1.81 | 82 | 2.35 | 132.0 | 1.12 | 28.0 |
| 20 | 1.71 | 73 | 1.70 | 72 | 2.06 | 104.0 | 1.08 | 26.0 |
| 21 | 1.93 | 93 | 1.61 | 64 | 1.85 | 85.0 | 1.10 | 27.0 |
| 22 | 1.81 | 82 | 1.75 | 76 | 1.75 | 76.0 | 1.07 | 25.0 |
| 23 | 1.36 | 45 | 1.78 | 79 | 1.45 | 52.0 | 1.15 | 30.0 |
| 24 | 1.51 | 56 | 1.71 | 73 | 1.08 | 26.0 | 1.00 | 20.0 |
| 25 | 1.46 | 53 | 1.64 | 67 | 1.60 | 63.0 | 0.95 | 17.5 |
| 26 | 1.75 | 76 | 1.66 | 68 | 1.55 | 59.0 | 0.90 | 15.0 |
| 27 | 1.91 | 91 | 1.92 | 92 | 1.50 | 55.0 | 0.89 | 14.6 |
| 28 | 1.51 | 56 | 1.76 | 77 | 1.35 | 45.0 | 0.84 | 12.6 |
| 29 | 1.32 | 42 | 1.36 | 45 | 1.15 | 30.0 | 0.79 | 10.6 |
| 30 | 1.48 | 54 | 1.06 | 24 | 1.00 | 20.0 | 0.75 | 9.0 |
| 31 | ..... | ..... | 0.94 | 17 | ..... | ..... | 0.70 | 7.0*a* |

*a* Station discontinued.

MONTHLY DISCHARGE of Souris River at Melita, for 1915.

(Drainage area 10,673 square miles.)

| Month. | Discharge in Second-Feet. | | | | Run-Off. | |
|---|---|---|---|---|---|---|
| | Maximum. | Minimum. | Mean. | Per square Mile. | Depth in inches on Drainage Area. | Total in Acre-feet. |
| April | 250 | 42.0 | 132 | 0.0124 | 0.013 | 7,855 |
| May | 92 | 17.0 | 63 | 0.0059 | 0.007 | 3,874 |
| June | 181 | 2.2 | 35 | 0.0033 | 0.003 | 2,083 |
| July | 63 | 3.2 | 28 | 0.0026 | 0.003 | 1,722 |
| The period | ..... | ..... | ..... | ..... | 0.026 | 15,534 |

NOTE.—Run-off during 1915 has been enhanced by the discharge of works draining river bottoms in the state of North Dakota.

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Souris River drainage basin, in 1915.

| Date. | Engineer. | Stream. | Location. | Width. | Area of Section. | Mean Velocity. | Discharge. |
|---|---|---|---|---|---|---|---|
| | | | | *Feet.* | *Sq. ft.* | *Ft. per sec.* | *Sec.-ft.* |
| Feb. 22 | E. W. W. Hughes | Souris River | Weyburn | ..... | ..... | ..... | Nil |
| Mar. 9 | do | do | do | ..... | ..... | ..... | " |
| Mar. 24 | do | do | do | ..... | ..... | ..... | " |
| April 23 | do | do | do | ..... | ..... | ..... | " |
| June 22 | F. K. Beach | do | do | ..... | ..... | ..... | " |
| Sept. 2 | do | Graham Creek | SW. 1-4-27-1 | ..... | ..... | ..... | " |
| Sept. 3 | do | South Antler Creek | NW. 22-2-27-1 | ..... | ..... | ..... | " |
| Sept. 3 | do | North Antler Creek (Gainsborough) | SW. 33-2-27-1 | ..... | ..... | ..... | " |
| Sept. 4 | do | Souris River | Weyburn | ..... | ..... | ..... | " |
| Oct. 28 | F. R. Steinberger | do | do | ..... | ..... | ..... | " |
| Dec. 6 | do | do | do | ..... | ..... | ..... | " |
| Dec. 21 | do | do | do | ..... | ..... | ..... | " |

# APPENDIX No. 1

## REPORT OF O. H. HOOVER, B.A.Sc., DISTRICT HYDROMETRIC ENGINEER, FOR THE YEAR 1915.

### *Introduction.*

In this report I have intended to cover in a concise manner the office and field work as performed, according to districts, as well as suggesting certain recommendations *re* the work of 1916. Special attention is given to my services in the headwaters of the North Saskatchewan River district. A tabulated summary of the season's work is also included.

### *Office Work.*

From January 19 to April 16, inclusive, I was at the Irrigation Office, Calgary, completing the final computations of stream flow for the Cardston Hydrometric district, calendar year 1914.

### *Cardston District.*

During the part of January 1 to 18, inclusive, I had charge of the field work in the Cardston Hydrometric district, which includes roughly the square bounded on the south and north by the international boundary and a line joining the towns of Lethbridge and Pincher Creek, respectively. Apart from the Belly and St. Mary Rivers the streams included are small. They however maintain a liberal summer discharge, being fed by snow and ice from the mountains. Irrigation is largely practised in this district, and the measurements on streams of an international character are especially important. During the winter season nine regular gauging stations were maintained. I was relieved from this district by Engineer Degnan on January 18, and returned to Calgary on account of office work.

### *Banff District.*

On April 17, I left Calgary for Banff relieving Engineer Ritchie of his field Hydrometric duties for eleven days. Concerning the work of this district I have little to say, as the same will be better taken up in Mr. Ritchie's report.

### *Nordegg District.*

On returning from Banff to Calgary April 29, I received instructions to assume charge of the field work in a new hydrometric district which later became known as the Nordegg district. It includes the North Saskatchewan River and its tributaries west of Rocky Mountain House, and the headwaters of the Brazeau River.

In carrying out the work of this district as much data as possible regarding the run-off was obtained, and in addition a limited time was spent on gaining information which would be of value for power development, and storage for water power. A slight co-operation with the Public Works Department *re* the location of dam sites was also carried out, during the season's work.

### *Temperature.*

The run-off as regards distribution is materially affected by the temperature of this district. Low temperatures beginning in November and ending in April form snow and ice over the entire area which temporarily stores a large percentage of the precipitated moisture.

### *Geology.*

Geology has a varied effect on the run-off as the area comprises a foothill as well as a mountainous country. The southwest half of the district may be considered within the outer ranges of the Rocky Mountains. A fair percentage of the higher areas of this portion consists of bare rock, of the limestone and quartzite varieties. The upper slopes are also steep, shedding immediately a very large percentage of the water falling upon them. Coming lower into the valleys the soil changes from a drift or alluvial to a loam, and although these soil depths often appear shallow yet the run-off is materially retarded at these levels. In the foothill area directly west of Rocky Mountain House the soil varies from a sandy and gravelly soil to a clay loam.

*Topography.*

The general topography slightly affects the total run-off but has a marked effect on its distribution. The chief effect on the total run-off is through evaporation. This district containing in all only seven lakes, none of which are larger than two and one-half miles by one mile, the evaporation is therefore not a large factor.

*Re* the distribution however, very high mountain ranges exist, 10,000 feet being quite a common elevation. These cause the precipitation of large quantities of moisture, and by their storage of ice and snow form the principal reservoirs of the district. The inner ranges, on which are located Peyto Glacier, Howse Pk., Pyramid Mt., Sawback Mt., Mt. Coleman, Mt. Freshfield, and Mt. Walker, are especially well located for the preservation of snow and ice fields. In this area it is the warm west wind as much as the sun's rays that melts the ice. By inspection it was noted that these ranges have a general northwest direction, they also contain large pockets or traverse gorges, and steep eastern slopes, which tend to shelter from the sun's rays as well as from the western wind. The most important ice-fields are those of the Freshfield area and those at the head of Glacier Lake.

*Vegetation.*

A liberal tree growth is supported over practically the entire soil area, notable exceptions being at the Kootenay Plains, and on certain lower flats usually near the stream channels. At different times it was found difficult to locate feed for our pack ponies during a whole day's travel, on account of tree growth.

The trees as a rule are young and consist of evergreens, mainly spruce and pine. Many fires in past years have swept through the country and different stages of tree growth are evident. Many localities are also thickly covered with fallen timber as a result of the fires. The oldest and finest forest growth that came to my attention, was found in the Mistaya River Valley between its mouth and the lower Waterfowl Lake. A large area of the forests of the district is protected by the Dominion Forestry Branch, and known as the Clearwater Forest Reserve. Vegetation through tree growth therefore has a marked retarding effect on the distribution of the run-off.

*Party and Transportation Facilities.*

My entire party consisted of one helper, Edward Matheson; one packer, Tom Wilson, and self. Five pack ponies, and three saddle horses were used for the transport, being the only means of covering the entire district. The Canadian Northern railway runs between Rocky Mountain House and Nordegg, but when once in the district this road is of little use for field work. A waggon road has been constructed by the Forestry Branch up the North Saskatchewan River Valley from Nordegg to the whirlpool, a distance of about fifty miles. The best trails are those which have been constructed by the Dominion Forestry Branch, and these are being rapidly improved and extended each year. A tabulated list of the trails, etc., covered by my party during the year is herewith included:

| From. | To. | Distance. | Time of travel. | Condition of trail. |
|---|---|---|---|---|
| Nordegg | Bighorn River | 15 Miles | 5 Hours | Good. Hilly |
| Bighorn River | Cline River | 18 " | 6 " | Good. Hilly. |
| Cline River | Wilson's Ranch | 8 " | 2½ " | Good, ford Saskatchewan. |
| Wilson's Ranch | Wilson's Creek | 18 " | 5½ " | Good. |
| Wilson's Creek | Glacier Lake | 15 " | 5 " | Fair at low water. |
| Wilson's Ranch | Careless Creek | 12 " | 4 " | Good. |
| Careless Creek | Mistaya River | 15 " | 6 " | Soft. |
| Wilson's Ranch | Siffleur River | 4 " | 1½ " | Good. |
| Glacier River | Cr. from Howse Pass | 8 " | 2½ " | Gravel wash. |
| Mouth Mistaya River | Waterfowl Lakes | 15 " | 5½ " | Very poor. |
| Waterfowl Lakes | Near Peyto Lake | 11 " | 3½ " | Good. |
| Nordegg | Mouth Shunda Creek | 20 " | 6 " | Poor. |
| Shunda Creek | Tp. 20, Rge. 11, W. 5th Mer. | 15 " | 5 " | Very poor. |
| Tp. 40, Rge. 11, W. 5th Mer | Ram River | 12 " | 4½ " | Very poor. |
| Nordegg | Stove Creek | 15 " | 5 " | Good. |
| Stove Creek | Nelson's cache | 6 " | 2 " | Good. |
| Nelson's cache | Mouth S. Brazeau River | 28 " | 9 " | Fair |
| Nelson's cache | Chungo Creek | 8 " | 3 " | Good. |
| Chungo Creek | Brown Creek | 5 " | 1¾ " / 8 " | Good. |
| Stove Creek | Blackstone Creek | 23 " | 2 Days. | Fair. |
| Blackstone Creek | Big Brazeau River | 14 " | 5 Hours | Fair. |
| Brazeau River | Brazeau Ranger Cabin | 5 " | 2 " | Good. |
| Brazeau Ranger Cabin | Isaac Creek | 17 " | 7 " / 8 " | Very poor. |
| Isaac Creek | Brazeau Lake | 23 " | 2 Days. | Fair. |
| Brazeau Lake | Upper branches Brazeau River | 14 " | 5 Hours | Fair. |
| Upper branches Brazeau River | A point over Cataract pass | 15 " | 7 " | Extremely poor. |
| Cataract Pass | Mouth Coral Creek | 15 " | 5 " | Fair. |
| Mouth Coral Creek | Mouth Cline River | 18 " | 7 " | Fair. |

*Cable Stations.*

During the season five cable stations were erected. The first of these spans the North Saskatchewan River near Wilson's ranch at about Tp. 40, Rge. 13, W. 5th Mer. This structure is owned by the Forestry Branch and was erected in May under my supervision. The span is about 270 feet and pyramid timber towers carry a one-inch steel cable. This structure was built for transportation purposes as well as stream measurements.

A second cable was placed over the North Saskatchewan River about one mile below the mouth of Shunda Creek at about Tp. 40, Rge. 13, W. 5th Mer., during the latter part of July. This structure required only one tower which was built of twelve-inch round timbers. The span is 300 feet and a three-quarter inch steel cable was used.

Other cables were erected over the following streams:—Bighorn River at about Tp. 39, Rge. 16, W. 5th Mer., Cline River at about Tp. 37, Rge. 18, W. 5th Mer. and Mistaya River at about Tp. 34, Rge. 20, W. 5th Mer. Nine-sixteenths inch cable was used in each case, these spans being less than 150 feet. A cable was also transported to a site on the Siffleur River at about Tp. 35, Rge. 17, W. 5th Mer., but on account of the season ending time did not permit of the erection of this structure.

NORTH SASKATCHEWAN RIVER.

The North Saskatchewan River is the main drainage channel in the district. Its source is found in the Rocky Mountains at about 52° 30′ N. Latitude and 117° 15′ W. Longitude, the head of the North Branch. What might be termed a secondary source is the Freshfield ice area, located at about 51° 00′ N. Latitude and 117° 00′ W. Longitude, the head of the Middle Branch.

The North Branch I was unable to visit, but from the forest rangers I learned that it consisted of a typical high level mountain stream with its steep gradient, rapids and rocky canyons. The Middle Branch was inspected from below the stream entering from Howse Pass. It has a very even gradient during its entire course, it is without falls and very free from rapids. The river bed, however, is notably wide, one-half mile being common I should say, and this appears as an immense gravel wash during low water.

Between the junction of the North and Middle Branches and the Kootenay Plains, the Saskatchewan flows in a northeast and easterly direction. The gradient is quite even though supporting a swift flow, and the channel is generally wide, forming islands at different points. Few rapids affect this portion of the river. At a point about ten miles above the Plains a small whirlpool exists, below and near which is a very narrow point on the river channel, as the same passes through a small rock gap. The water surface width at this point is about 160 feet. Two rivers and about ten creeks enter the Saskatchewan above the Plains. At the Kootenay Plains stream measurements were obtained by means of the cable during the entire season. The discharges varied from 21,176 second-feet on June 27, to 881 second-feet on October 29. The former result was, however, a very abnormal flood discharge and the ordinary annual high water discharge would probably not be more than 10,000 sec.-feet. The drainage basin area at this point is about 836 sq. miles.

Between the Kootenay Plains and the mouth of Shunda Creek the Saskatchewan flows in a north, northeast and easterly direction. The channel varies, being extremely wide in one place and quite narrow in another. More islands are in evidence and some difficult rapids are encountered. The mouth of Shunda Creek takes the Saskatchewan about twelve miles out of the mountains.

Between Shunda Creek and Rocky Mountain House the Saskatchewan flows in an easterly direction and has a fairly even gradient, seldom disturbed by rapids. The stream also follows a straighter course and has a narrower channel with higher banks. About one mile below the mouth of Shunda Creek, at the cable site, stream measurements were obtained during the latter part of the season. A gauge was also established and daily records obtained. Discharges varied from 43,841 sec.-feet on June 27 and 28, to 903 sec.-feet on November 8.

No falls were observed on the Saskatchewan between the upper branches and Rocky Mountain House. The river valley is moderately uniform and contains one immense gap, being where it leaves the mountains through the Brazeau range. Between the Kootenay Plains and Rocky Mountain House four rivers and about twenty creeks enter the Saskatchewan.

BRAZEAU RIVER.

The Brazeau River forms the secondary basin of the district. It rises at about 53° 00′ N. Latitude and 117° 00′ W. Longitude and flows in a general northeasterly direction. I was unable to make a complete reconnaissance of this stream and obtained no measurements lower than Brazeau Lake. On September 7 the discharge below the outlet stream from Brazeau Lake was 565 sec.-feet, 420 sec.-feet of which came from the lake. I followed the Brazeau from the Dowling ford at about Tp. 42, Rge. 20, W. 5th Mer., to the entarnet pass. The portion below Brazeau Lake I found very sluggish with a comparatively narrow channel and deep water. The course was winding and passed through a thickly wooded area. Above the lake the gradient rapidly changed becoming steep as it approached the upper branches. The stream was also visited at the mouth of the South Brazeau River, and found to contain a very wide channel, with gravel washes and rapid water. This location was very difficult to arrive at.

### MISTAYA RIVER.

The Mistaya flows in a northeasterly direction from the Bow Pass and Peyto Lake to its mouth on the Saskatchewan River about one mile below the mouth of the North Branch. The gradient is very steep causing a total drop of at least 1400 feet. The stream is a very notable one on account of the lakes through which it passes and from a scenic viewpoint. It is wonderfully picturesque with its narrow valley formed of very high mountains, inlaid with glaciers, moraines and forests. The stream passes through four lakes, two of which are called the Waterfowl Lakes. A fifth lake also lies at the southeast foot of Pyramid Mountain and drains from the west into the Mistaya. These lakes and glaciers control very materially the distribution of the run-off of this stream. The lower part of the river channel passes through very deep narrow canyons which have been formed by the swift stream action on the sedimentary rock formation. Rapids in succession occur on these lower stretches. A few discharges were obtained at the cable station located near the stream mouth. These varied from 2166 sec.-feet on June 27 to 125 sec.-feet on October 9. The drainage area at the cable is about 135 square miles.

### SIFFLEUR RIVER.

The Siffleur flows in a northerly direction from the Pipestone pass to the Saskatchewan River at the Kootenay Plains. I visited only the lower portion of this stream and learned that about one mile above the mouth it entered a deep inverted cone-shaped rock canyon. Continuing about three-quarters of a mile up stream this formation changed to a narrow deep canyon which after one-quarter mile suddenly stopped, causing falls. The drop at these falls is about forty-five feet. Above this point the stream seemed to widen and remain nearer the valley level. Discharge measurements were made at the mouth of the lower canyon and varied from 1662 sec.-feet on June 27 to 135 sec.-feet on October 31. The drainage area at this point is about 229 square miles.

### WHITERABBIT CREEK.

This stream is about fifteen miles long, has a very straight channel and flows in a northeasterly direction entering the Saskatchewan about three miles below the Siffleur River mouth. The creek valley is notably narrow with steep rock slopes usually void of tree growth. A steep gradient also assists in causing a violent run-off. Large daily variations were noticed. Discharge measurements were made about one-half mile above the stream mouth. These varied from 222 sec.-feet on June 7 to 19 sec.-feet on May 18. The drainage area at the measurement point is about 213 square miles.

### CLINE RIVER.

The Cline flows in an easterly direction from the Cataract Pass to the Saskatchewan River at about Tp. 37, Rge. 18, W. 5th Mer. The upper course of this stream which has a large drop is called Cataract Creek and passes through a narrow valley bounded by high mountains and numerous small ice areas. Snow slides destroy much of the timber of this valley. Lower down the stream also retains a steep gradient and about four or five miles above its mouth the river passes into a very deep rock canyon. This continues for probably two miles after which the stream widens very much forming a large gravel wash near the mouth. Discharge measurements were obtained at the cable site about one-half mile above the mouth of the canyon. These varied from 1714 sec.-feet on July 9 to 161 sec.-feet on November 18. The drainage area at the cable is about 276 square miles.

### BIGHORN RIVER.

The Bighorn flows in a south and easterly direction from Tp. 40 Rge. 17, W. 5th Mer. to the Saskatchewan River at Sec. 16, Tp. 39, Rge. 16, W. 5th Mer. I was unable to reconnoitre the upper portion of this stream and am unable to report on same. Within four miles of the stream mouth, however, travelling upstream the channel changes from a very wide gravel wash to a narrow stream bed with high rock banks. I also believe a fall is located about six miles upstream from the mouth. Regular measurements were obtained at the cable station at Tp. 39, Rge. 16, W. 5th Mer. Discharges varied from 401 sec.-feet on July 11 to 27 sec.-feet on November 21. The drainage area is about 91 square miles.

### MARTIN CREEK.

This very small stream rises about four miles southwest of Nordegg flowing northeast through Nordegg to its mouth on Shunda Creek about one mile below the town. Gauge height and discharge records were obtained at SE. Sec. 27, Tp. 40, Rge. 15, W. 5th Mer. a point just above the intake of the Nordegg water works. Discharges varied from 15.2 sec.-feet on July 15 to 0.042 sec.-feet on November 5. The drainage area is about five square miles.

SHUNDA CREEK.

Shunda Creek, locally known as Mire Creek, rises in Tp. 41, Rge. 16, W. 5th Mer., and flows in a southeast and northeasterly direction to its junction with the Saskatchewan at about Tp. 40, Rge. 13, W. 5th Mer. The stream is well named as the basin contains much muskeg and a large tamarack swamp. The upper gradient is even and small but increases on the lower stretches of the stream. A gauging station was established near the mouth on June 3, and gauge heights were observed during the latter part of the season. Discharges at this point varied from 3426 sec.-feet on June 27 to 18.6 sec.-feet on November 6. The drainage area is about 120 square miles.

RAM RIVER.

Ram River, locally known as Sheep River, enters the Saskatchewan from the south at about Tp. 39, Rge. 11, W. 5th Mer. I was unable to reconnoitre this stream more than a few miles above its mouth; however, I understand that at a point about twenty miles upstream the river divides about equally, one branch following a western course and the other continuing in a southwesterly direction. Discharge measurements were obtained about one mile up from the stream mouth. These varied from 33,579 sec.-feet on June 27 to 710 sec.-feet on September 25. The drainage area at this station is roughly 803 square miles.

SOUTH BRAZEAU RIVER.

The South Brazeau rises in Sec. 21, Tp. 41, Rge. 19, W. 5th Mer., and flows in a northeasterly, east and northerly direction to its mouth on the Brazeau at about Tp. 44, Rge. 16, W. 5th Mer. The headwaters comprise three branches, Blackstone Creek from the west, George River from the southwest and Smith Creek from the south. These join the main stream at Tp. 42, Rge. 19, W. 5th Mer., which during the first mile of its course flows through a very narrow pass in the Brazeau Range, thus leaving the mountains. The stream below this point has a fairly steep gradient with a channel varying from the wide gravel wash to the very narrow deep style bounded by high rock banks. A gauging station was established at a point about one mile above the mouth of Chungo Creek and two measurements were obtained. The discharge on June 27 was 30,419 sec.-feet and on August 27, 331 sec.-feet. The drainage area is about 352 square miles.

SOUTHESK RIVER.

The Southesk rises in Tp. 43, Rge. 22, W. 5th Mer., and flows southeast, east and northeast to its mouth on the Brazeau River at Tp. 43, Rge. 20, W. 5th Mer. I reconnoitred this stream for about five miles above its mouth and found a narrow channel with high rock banks and a steep stream gradient. This section of the stream valley was thickly wooded and partly covered with fallen burnt timber. A gauging station was established at the ford at about Sec. 6, Tp. 43, Rge. 20, W. 5th Mer., and two measurements were obtained. The discharges were 3,835 sec.-feet for June 27, and 462 sec.-feet for September 2. The drainage area at this point is 176 square miles.

CHUNGO CREEK.

Chungo Creek rises in Tp. 42, Rge. 19, W. 5th Mer., and flows in a northeasterly direction through the Brazeau range to its mouth on the South Brazeau at about Tp. 43, Rge. 17, W. 5th Mer. A gauging station was established near the stream mouth and two measurements were obtained. These discharges were 9,351 sec.-feet for June 27, and 69 sec.-feet on August 26. The drainage area at this point is about seventy-seven square miles.

BROWN CREEK.

Brown Creek, rises in Tp. 42, Rge. 19, W. 5th Mer., and flows in an easterly direction to its mouth on the South Brazeau River at Tp. 43, Rge. 18, W. 5th Mer. A gauging station was established at a point about five miles upstream from the mouth and two measurements were obtained. These discharges were 11,982 sec.-feet and 42 sec.-feet on June 27 and August 28, respectively. The drainage area at this station is about fifty-seven square miles.

*Recommendations.*

I beg to submit the following recommendations for the improvement of certain stations during 1916.

1. That an automatic gauge of the Stevens type be established on the North Saskatchewan River at Wilson's ranch at about Tp. 40, Rge. 13, W. 5th Mer.
2. That cables be erected on the following streams:—

(*a*) Ram River near mouth of stream at gauging station.
(*b*) South Brazeau River above mouth of Chungo Creek at gauging station.
(*c*) Brazeau River near Dowling's Ford.
(*d*) Southesk River near Forestry Ford at gauging station.

*General.*

Whenever possible during the season's work water storage sites were investigated, and rough surveys made. The following sites were reported on: Brazeau Lake, Glacier Lake, Peyto Lake, and the Waterfowl Lakes. Of these, Glacier Lake is probably of most importance.

Miscellaneous measurements were made whenever considered of value.

All discharge measurements of June 27 in connection with the maximum discharges of June are the results of slope measurements.

A tabulated summary of the season's work is included as follows:—

| | |
|---|---|
| Regular measurements | 80 |
| Miscellaneous measurements | 47 |
| Miles travelled via rail | 1715 |
| Miles travelled via trail | 1489 |
| Gauging stations established | 11 |
| Cables erected | 5 |
| Surveys made | 7 |
| Irrigation inspections | 1 |

# APPENDIX No. 2

## REPORT OF P. H. DANIELLS, B.Sc., DISTRICT HYDROMETRIC ENGINEER, FOR THE YEAR 1915.

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## REPORT ON THE PEACE RIVER DISTRICT.

The Peace River district, organized during the past season, includes streams in both the Peace and Lesser Slave River drainage basins.

Previous to 1915 no work was done in this district except on the Lesser Slave River near Sawridge, where a few miscellaneous measurements were made in 1914. However, during the past season this territory was made a regular "Hydrometric district" and a few gauging stations were established in each drainage basin. On account of the poor methods of transportation in the Peace River country it was not feasible to cover the whole district, and measurements at the stations established could only be made at rather long intervals.

### THE PEACE RIVER.

The Peace is formed by the confluence of the Parsnip and Finlay Rivers both of which rise in and drain a large district lying along the eastern slope of the Rocky Mountains in northern British Columbia.

The important tributaries of the Peace River are the Pine, Smoky, Wabiskaw and Red Rivers.

There are several smaller streams which discharge their waters into the Peace, but as all of them except the North Heart flow through a very sparsely settled country, they are as yet of little interest to this office.

The Pine River rises in the mountains of British Columbia and enters the Peace on the south side about thirty miles west of the Alberta boundary, it is the largest tributary west of the Smoky River.

The Smoky and North Heart Rivers will be taken up separately in this report.

The Wabiskaw and Red Rivers both rise on the height of land west of the Athabaska River and drain a large extent of low country lying between the Athabaska and Peace Rivers and north of the Lesser Slave Lake. No measurements were made on either of these rivers during the past season, but it is probable that a few miscellaneous measurements will be made during the coming winter.

Except for the last two mentioned streams the branches of Peace River all obtain the greater portion of their supply from the mountains, and the stage of water is governed to a great extent by the winter precipitation, therefore floods in the early spring are not usual. However, during July the high temperatures and warm rains in the mountains cause the snow-covered area of the drainage basin to discharge large quantities of water, and it is at this time that the greatest floods occur. In 1915 there was no exceptional flood on the Peace River. The maximum stage was reached on July 14 and was caused by a warm rain in the upper drainage basin. The effect was more noticeable on the Smoky than on the Peace River.

For the purpose of description the Peace may very well be divided into three sections:

1. From its head to the mouth of the Smoky.
2. From the mouth of the Smoky to Fort Vermilion.
3. From Fort Vermilion to the Great Slave River.

The first section is about 300 miles long. Over this distance the river flows through a great plateau in which it has excavated to a depth of from 600 to 900 feet. The banks are steep and the valley narrow but gradually widening from the line between British Columbia and Alberta, where the river passes through a steep rocky canyon, known as the Peace Canyon, to Peace River Crossing where the valley is about three miles wide.

The country back from the river is composed of alternate patches of thinly wooded and prairie land with a few muskegs. A large percentage of the land is well suited for agricultural purposes. The district lying between the Peace and Wapiti Rivers, known as the Grande Prairie country, contains the largest percentage of open land. Owing to this fact and on account of the excellence of the soil and the lines of progress of the railways, this portion of the country is being the most rapidly settled.

The second section of the river, between the mouth of the Smoky and Fort Vermilion, is about two hundred and seventy miles long. Throughout this distance the river pursues a winding though northerly course nearly to Fort Vermilion and then turns eastward. The banks are about seven hundred feet high at the beginning of the section and gradually decrease in height until at Fort Vermilion the river is very little lower than the level of the surrounding country. Over this section the land adjacent to the river is nearly all wooded with aspen, poplar and frequent patches of spruce; it also contains numerous muskegs. Back a few miles from the river on both sides there are portions of open land suitable for immediate settlement and as the stream approaches Fort Vermilion the prairie extends to the river banks. Close to Fort Vermilion, especially on the south side of the river, there are large patches of prairie land. At this point there has been a settlement for several years and all ordinary grains and vegetables have been grown successfully.

The third section of the river, between Fort Vermilion and the Great Slave River, is about two hundred miles long. The stream flows in a northeasterly direction for about one hundred and fifty miles and then takes a general easterly course until it is joined by the overflow from Lake Athabaska forming the Great Slave River. The country through which the river flows in this section is not well known. I had no opportunity of getting over this portion during the past summer, and was unable to learn much about the surrounding country as all of the travelling through here has been done on the river.

The Peace is the largest and longest branch of the Great Northern Waterways system. It is navigable during high water from Hudson's Hope on the line between Alberta and British Columbia to the Great Slave River, a distance of nearly eight hundred miles, with only one interruption, the Vermilion Falls. At this point rapids and falls in the river necessitate a portage of about seven miles. During the lower stages there are two or three places between Dunvegan and Hudson's Hope where boats drawing much over two feet of water cannot pass.

There is an opportunity of extensive power development at two points on the Peace. The first is near Hudson's Hope where the river passes through a narrow rocky canyon, which is about twelve miles in length. Over this distance the river falls about sixty feet. The second point is at Vermilion Falls, about fifty miles downstream from Fort Vermilion. It has been estimated that 150,000 horse power could be developed here at the low water period, but our measurements made at Fort Vermilion show that this estimate is high.

The following facts about the Vermilion Falls and rapids were given me by Mr. Bisset, of the Water Power Branch, who made a survey of this site in October, 1915:—

The difference in elevation of the river between the head of the rapids and the foot of the falls is twenty-six feet in low water and gradually decreases as the water rises. About fourteen feet of this distance is taken up in the falls alone, the balance in the rapids above. On account of the low left bank of the river it would not be practicable to increase the head to much over thirty feet. The bed and banks of the river at this point are composed of solid limestone.

These are the only two points on the river where extensive power development is possible, but there is another larger fall in the river after it is joined by the overflow of Lake Athabaska and known as the Great Slave River. I made enquiries about this site and sent in a report in August.

During the past summer two gauging stations were established on the Peace River, one at Peace River Crossing in the northwest quarter of Section 29, Township 83, Range 21, West of the 5th Meridian, and one at Fort Vermilion in Section 14, Township 108, Range 13, West of the 5th Meridian.

The expense of constructing a cable station at either of these points would be excessive. Measurements were made at both points from some type of boat. At Peace River Crossing it was possible to use the ferry boat most of the time. As it is impossible to make gaugings from any type of boat in high water, slope measurements were made at this time.

### THE SMOKY RIVER.

The Smoky River rises on the eastern slope of the Rocky mountains in Township 56, Range 8, West of the 6th Meridian, and flows in a general northerly direction to its mouth, about two miles south of Peace River Crossing. After leaving the mountains the river flows through a fairly low country, mostly wooded and containing numerous muskegs, until it is joined by the Wapiti River. From this point on, the general class of country drained by the river improves. The stream passes through high steep banks and is fairly swift throughout its length. Below

the mouth of the Little Smoky River, the river falls quite rapidly and contains a number of small rapids, the largest of which is known as the Twenty-five Mile rapids and is about twenty-five miles from the mouth. On account of the numerous rapids and the quantities of large boulders lying in the river bed it is navigable only in the higher stages and then only for boats of quite light draft.

The largest tributaries of the Smoky are the Wapiti and Little Smoky Rivers. The Wapiti River rises in Township 65, Range 13, West of the 6th Meridian, and flows eastward to its mouth. It rises in the mountains and is fairly swift throughout its length. This river forms the southern boundary of the Grande Prairie country and on this account will probably be one of the first streams in this country to be developed. I intended to establish a regular gauging station near the mouth of this stream during the past summer and ordered the necessary supplies for it, but on account of the irregularity and uncertainty of transportation decided that it would be advisable to wait until next season, when it will be possible to reach Grande Prairie by railroad. In this case it will be quite easy to establish and maintain a station near Grande Prairie city.

The Little Smoky River rises in Township 56, Range 3, West of the 6th Meridian, and drains a large low country between the Athabaska and Smoky rivers. It enters the Smoky River at the east side about sixty-five miles upstream from the Peace River. One measurement was made near the mouth during the past season.

The gauging station on the Smoky River was established on June 4 at Prudent's Crossing in SW. ¼ Section 10, Township 78, Range 24, West of the 5th Meridian. The discharge measurements were made from the ferry boat. In this case also it was found impossible to work from the boat during high water stages and slope measurements were made. A cable station could be established here at a comparatively small cost, but as the Edmonton, Dunvegan and British Columbia railway are now building a bridge about two miles upstream from the station it will probably be unnecessary.

### NORTH HEART RIVER.

The North Heart River rises in Township 80, Range 19, West of the 5th Meridian, and flows in a northeasterly course to its mouth at Peace River Crossing. It flows through low banks and on easy gradients to within twelve miles of its mouth where it begins to fall quite rapidly and has excavated a deep, fairly narrow valley.

A gauging station was established on this stream about one-half mile from its mouth on June 2, 1915. The station is a poor one on account of its nearness to the Peace River, the stage being affected by high water in the Peace. Although this was known when the station was established it was impossible to obtain an observer at a point away from the influence of the Peace River.

### *Miscellaneous measurements.*

Miscellaneous measurements were made of the following streams in the Peace River district during 1915:—

Little Smoky River, near mouth; Cadotte River, near mouth; Whitemud River, near mouth; Battle River, near mouth; Buffalo River, near mouth.

In concluding this part of my report I wish to recommend that a motor boat be purchased for use in this district. While a discharge measurement made from any type of boat is not entirely satisfactory, much better work can be done from a motor boat for several reasons. First, it can be used in fairly swift water where it is practically impossible to use a hand-propelled boat. Second, owing to its greater weight it can be used in a strong wind, when it is impossible to keep a canoe in a constant position. Third, a stay line can be used with a motor boat. Fourth, greater speed can be obtained.

The motor boat as a means of transportation would soon pay for itself. It could be used for any work on the Peace River between Hudson's Hope and Fort Smith, and if the right type of boat was secured it could be used upon the Smoky River between Peace River Crossing and the mouth of the Wapiti River.

I would suggest, for this purpose a flat bottomed tunnel boat about twenty-four feet long and with a four and one-half foot beam, to draw not more than ten inches of water and to be capable of developing a speed of about six miles per hour against the Peace River current. This I think could be done with a 16–20 h.p. motor. This type of boat could be obtained for about $650.00 and could be used during the entire open water season, except for about two weeks in July during the flood stages. At this time it is impossible to use any kind of boat for making gaugings on account of the large quantities of driftwood running.

I found during the past summer that it is cheaper to travel in a small motor boat, also that on account of the steamboats operating on the river not running on a regular schedule, it is impossible to make gaugings at such points as Fort Vermilion with any regularity. During the past season there were only four steamboat trips made between Peace River Crossing and Fort Vermilion, and only one between Peace River Crossing and Hudson's Hope.

LESSER SLAVE RIVER DRAINAGE BASIN.

The Lesser Slave River drainage basin is bounded on the north by the Wakiskaw and Red Rivers, on the west by the Smoky and on the south by the Athabaska River. The drainage from the country included in this area passes into the Lesser Slave Lake, a large, shallow lake with low marshy shores. The land surrounding the lake and, in fact, all of the country in the drainage basin, except in the extreme southern end, is low, mostly wooded with aspen and spruce and contains numerous muskegs.

The South Heart and Swan Rivers are the two most important ones emptying into the lake; some of the minor streams are the Driftpile and Assineau Rivers and Sucker Creek, but they are quite small, discharging only from two to ten second-feet during the low water period.

The nature of the country in this drainage basin is such as to make most of the streams practically useless from a standpoint of power development or for irrigation purposes.

Only two regular gauging stations were established in this district, one on the Swan River near Kinuso and one on the Lesser Slave River at Sawridge.

SWAN RIVER.

The Swan River rises in the mountains in the extreme southern end of the drainage basin and flows northward. After leaving the foothills it is joined by the Inverness River and from this point passes through a low level country to its mouth.

LESSER SLAVE RIVER.

The Lesser Slave River obtains nearly all of its supply from the Lesser Slave Lake and discharges into the Athabaska River. At its head the gradient of the river is very slight, the course winding and the banks quite low. As it approaches the Athabaska the banks become higher and the fall more rapid. About sixteen miles from its mouth there is a rapid, and at this point an opportunity for a considerable power development exists.

The stage of the Lesser Slave River is regulated by the water level of the lakes. and floods do not occur. The flow is fairly constant, there being less difference between the summer and winter discharge than on the ordinary Alberta stream.

Miscellaneous measurements of the following streams in this drainage basin were made:

East Prairie River, near High Prairie; West Prairie River, near High Prairie; South Heart River, near High Prairie.

# APPENDIX No. 3

## THE USE OF BOATS FOR MAKING STREAM MEASUREMENTS,

By P. H. DANIELLS, B.Sc.,

District Hydrometric Engineer.

This paper will be limited to a description of the several types of boat measurements made on the Peace River district during the past summer.

These types can be classed under the three following heads:

1. Measurements made from ferry boats.
2. Measurements made with boat and anchor.
3. Measurements made with boat and cable.

Although a gauging made from any sort of boat is not entirely satisfactory, the best results are probably obtained with a boat and cable, but owing to the great width of the rivers in this district it was impossible to employ this method very often, and I will therefore take up more particularly the description of the first two methods.

FERRY BOATS.

Two types of ferry boats were used. First the ordinary scow ferry. This design of ferry boat is familiar to everyone so a description of it is not necessary. This boat is not very well adapted to our work because of the difficulty of keeping it in a constant position and because it cannot be used in swift water as the increased pressure on the cable, when the boat is turned squarely against the current, is too great. Also the current-meter must be suspended from one end of the ferry on account of the velocity immediately in front or at back of the boat being affected by the submerged portion, and as the boat always swings from side to side to a small extent, this will cause a small error in the recorded velocities.

The second type is the pontoon ferry and as a boat for stream measurement work this design could hardly be improved upon. This boat, as shown in Fig. 1, consists of a platform bridged across two sharp-nosed scows. The scows are about ten feet wide and are placed twelve feet apart. The platform is so far forward that the stern end of it is quite close to the centre of the ferry, and if the current meter is suspended at the point (A), any error in the recorded velocities caused by the swinging motion of the boat is eliminated. The velocity of the water under the centre of the bridge is not disturbed by the submerged portion of the scows. This type of boat can be used in any stage of water, the pressure on the cable being much less when the boat is stationary than when it is in motion. The total length of the ferry is about thirty feet, and it is, therefore, possible to use a proper stay line.

*Boat and Anchor.*

This method was used with two types of boats, a motor boat and a canoe. The former is the most satisfactory for several reasons. It can be used in faster water and if properly equipped a stay line can be used. Owing to its greater weight a motor boat can be held stationary in a fairly hard wind while a canoe, even though anchored from both bow and stern, will shift slightly from side to side in a gentle wind and if the wind is strong across the river or upstream it is impossible to use a canoe with any degree of accuracy. The greatest disadvantages of a canoe are that a stay line cannot be used and that it does not allow the operator to move around freely. In my work it was used only when it was impossible to employ any other method. The meter was suspended about four feet in front of the boat and on account of no stay line being used velocities were read at a depth of four feet. The boat was anchored at both bow and stern. This method is very slow, it is necessary to lift both anchors entirely out of water before any progress can be made with the boat and in a fairly swift current it takes several minutes to get back to the line of measurement. It is quite difficult to judge the distance between soundings with any accuracy especially if the interval of paddling is very long, and often it is necessary to make two or more attempts before the proper location is reached.

With the motor boat the meter was suspended from the stern and about four feet to one side of the boat. The boat was anchored from the bow only. By use of the engine it was possible to move quickly and without lifting the anchor out of the water and soundings could be made at fairly regular intervals with very little difficulty. The engine was running at all times, but with the clutch thrown out after the boat was anchored.

With any type of boat it is difficult to judge the distance between soundings, especially near the centre of the stream. I tried to overcome this by using floats anchored at regular intervals across the stream. This method worked wery well in shallow and sluggish water but in deep fairly swift water it took so long to arrange the float and anchor it in the proper location that I decided it was faster and easier to take the soundings at closer intervals and make sure of the distances in that way.

In all classes of boat measurements, except those made with a boat and cable, it is necessary to measure the distances of soundings by means of triangulation. In this case a sextant was used and angles were read from the boat. A much more satisfactory way would be to use a transit and measure the angles from the shore, but this would require an extra man.

Two stakes were placed on line with the measuring section so that the boat could be kept on line. From the stake nearest the river's edge an angle of ninety degrees was turned and a base line carefully measured. Stakes were placed along the base line at such places as would make the angles read neither too large nor too small. For instance, on the Peace River at Fort Vermilion, where the river is about eighteen hundred feet wide, a fifteen hundred foot base line was used. Stakes were put in at two hundred, five hundred, one thousand and fifteen hundred feet from the line of measurement and the angles read from the first stakes for distances up to about three hundred feet, then from the second stake, etc. Even distances were used to simplify the computations.

In the case of a ferry boat measurement, such as on the Peace River at Peace River Crossing, a slightly different method is necessary. At this point the river is about fifteen hundred feet wide in high water and, owing to this fact and on account of the swiftness of the current, the ferry boat does not pursue a straight course across the river but goes down stream for a considerable distance as it approaches the middle of the river and the slack is pulled out of the cable. Even by moving from end to end of the boat it was impossible to keep on the measuring line, therefore it was necessary to lay out two separate lines, one about fifty feet from the other. The full line, Fig. 2, was used for measuring angles between zero and five hundred and between one thousand and fifteen hundred. For the intervening distance the dotted line was used.

*Soundings.*

A little difficulty was experienced in getting accurate soundings. This was caused by trying to use the ordinary methods. At Peace River Crossing I was able to use a stay line and a weight of about two hundred and twenty-five pounds, but under the worst conditions encountered, a depth of twenty-eight feet and a velocity of over ten feet per sec., it was impossible to know whether the weight was on the bottom of the river or was being supported by the stay line I do not think accurate results can be obtained by the use of a stay line under such conditions. I found that by using a fifteen pound weight on a very light line, about one-eighth of an inch in

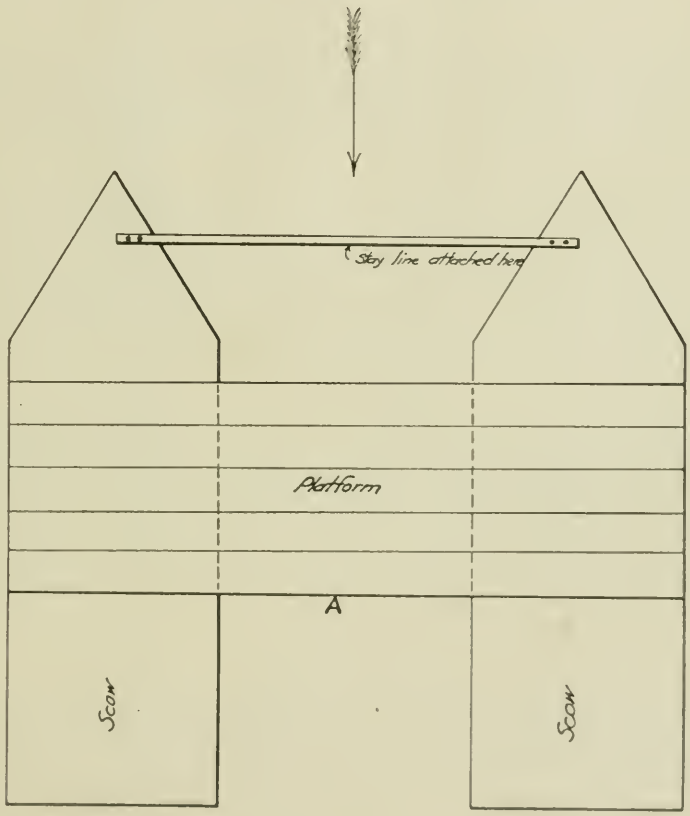


FIG. I

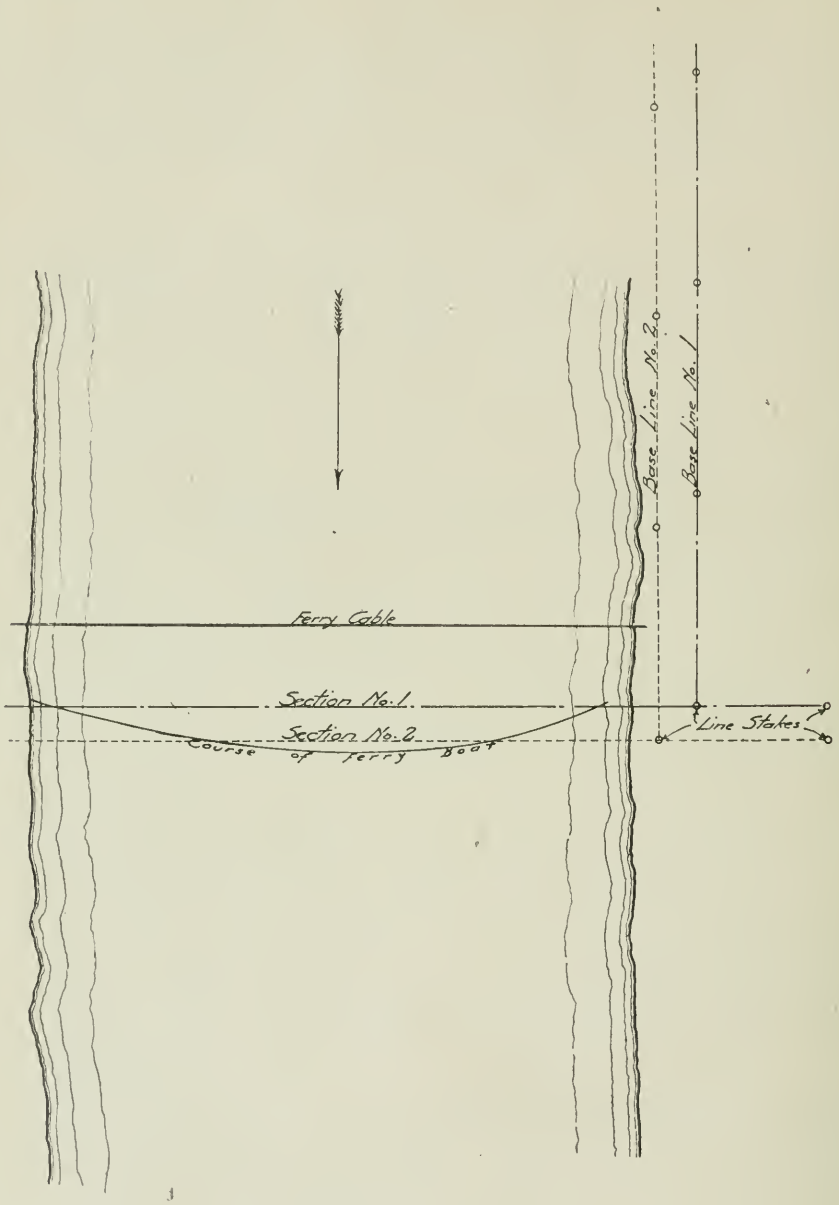
Base Line No. 2
Base Line No. 1
Ferry Cable
Section No. 1
Section No. 2
Course of Ferry Boat
Line Stakes

FIG. 2

diameter, and throwing it upstream as far as possible, the depth could be accurately measured just as the weight was passing the boat in the current. In the case mentioned it was also impossible to tell when the meter was at the proper depth for readings, and readings were taken at a depth of three feet, and a constant, which had been determined from several vertical velocity measurements made in the same stream but in slower water, applied.

# APPENDIX No. 4

## FLOODS IN ALBERTA AND SASKATCHEWAN IN JUNE AND JULY, 1915.

By G. H. WHYTE, Divisional Hydrometric Engineer.

### *General Introduction.*

In 1915 the eastern slopes of the Rocky Mountains between the Crowsnest and Yellowhead Passes in Alberta and the adjoining prairie in that province and portions of its eastern neighbour, Saskatchewan, were subject to unusual precipitation which during June was exceptionally heavy, culminating about June 25. This heavy precipitation caused the run-off for all streams in this area to be much above the average and in June and July caused floods on many of the streams.

High water on the streams of Alberta and Saskatchewan is usual at least once a year and is of two kinds, depending on the type of catchment area; the first kind, when the ice breaks up and the run-off of the winter snows of the prairies takes place, usually in March; and the second, caused by the run-off of the snows of the mountains in June or July. It is only occasionally that either of these periods of high water reaches the magnitude of a flood. Every few years on some of the minor streams and at longer intervals on the main arteries, floods of some magnitude occur which, while they may be augmented by the run-off of snow water, are caused by exceptionally heavy rainfalls in a short period of time over an already well saturated ground surface.

### *Scope of this Report.*

The object of this report is to present the principal and important facts pertaining to the discharge of streams during the flood of June-July, 1915. It is hoped that the data herewith given are complete and extensive enough for all ordinary purposes, but it is realized that many facts which may be of service are not given and with the time available it would be impossible to present these without also presenting much which would be of little value. A large quantity of data has been gathered at various points which is available on request. It is well to state that much was not obtained owing to the vast territory to be covered by a small staff of engineers who primarily collected only such data as was required for the proper compilation of the hydrometric work.

### *Accuracy of Data.*

The data herewith given are as reliable as possible but may contain some inaccuracies owing to the impossibility of obtaining full details at some points where none of our engineers were during the flood and where the gauges were destroyed. The computations are, with few exceptions, well within the required degree of accuracy as discharge curves for both the period before and after the flood were obtained in all cases. A few inconsistencies may appear as attempts to eliminate them have not been made where sufficient data was not available.

### *Acknowledgments.*

The precipitation data herewith given are from the records of the Meteorological Service of Canada. A few gauge heights and other records were obtained from various municipal and other authorities as well as from railway and private corporations. These records were of special value in individual station studies, and acknowledgments are due all who supplied such data and for such assistance as was rendered to our engineers during the progress of the flood.

### *Division of Work.*

The work during the flood was under the direct supervision of the Chief Hydrometric Engineer, Mr. P. M. Sauder, who was assisted in the office by Mr. W. K. Broughton. The streams on the Crowsnest Pass were under the charge of Mr. W. R. McCaffrey and those near Lethbridge under Mr. J. E. Degnan. The headwaters of the Bow River were under the charge of Mr. H. C. Ritchie, the Bow River at Calgary under the charge of Mr. G. H. Whyte, the

Elbow River at Calgary under the charge of Mr. G. R. Elliott, the tributaries south of Calgary under the charge of Mr. H. B. R. Thompson, and the Bow River at Bassano under the charge of Mr. R. J. McGuinness. The Red Deer River at Red Deer was under the charge of Mr. H. M. Nelson. The Athabaska River and tributaries were under the charge of Mr. J. M. Paul. The North Saskatchewan River was under the charge of Mr. I. R. Strome at Edmonton and Mr. G. H. Whyte at Prince Albert. Mr. Snelson had charge of the work on the South Saskatchewan River at Medicine Hat and Mr. F. K. Beach at Saskatoon.

The office ratings were made by W. R. McCaffrey, R. J. McGuinness, H. C. Ritchie, J. M. Paul, I. R. Strome and F. K. Beach, hydrometric engineers, under the supervision of G. H. Whyte, Divisional Hydrometric Engineer.

The computations were made by W. H. Storey, R. J. McGuinness, W. R. McCaffrey, H. C. Ritchie, J. M. Paul, I. R. Strome and F. K. Beach, hydrometric engineers, under the supervision of N. M. Sutherland and G. H. Whyte, Divisional Hydrometric Engineers.

*Temperature and Precipitation.*

The following meteorological data are attached as these factors play an important part in run-off and floods.

Table A 1 shows the mean temperature, total precipitation and highest precipitation on a single day as well as comparisons with the average at all stations on the eastern slope of the Rocky Mountains between the Crowsnest and Yellowhead Passes during June.

Table A 2 shows similar records for each month at a number of stations from October, 1914, to July, 1915.

Table A 3 gives monthly precipitations for the last ten years at various points.

Plate A 4 shows isohyetose lines for June also gauging stations and headwaters of the drainage basins affected by the flood. It should be noted that the isohyetose lines shown are only approximate and may be in error at various points.

It has been stated that on the headwaters of the North Saskatchewan River there was more snow than usual about June 25, while the opposite seems to be true about the headwaters of the Bow River. However, reliable data with respect to this factor are not available.

*General Causes of the Flood of June-July, 1915.*

The causes of the large run-off over a short period in June, 1915, can be classed under two general heads, namely:

(1) The heavy precipitation of that period.

(2) The conditions affecting the run-off.

Each of these two heads requires some discussion and while somewhat different are also closely connected. That is, unless conditions were favourable for a speedy run-off of much of the rainfall, no such flood could have occurred. From the meteorological records it is seen that there were unusual amounts of rain in both May and June, 1915. and the rains of June 24 to 27 were of exceptional density at some points, therefore, no further discussion of the first head is necessary.

Under the second head, "The conditions affecting run-off", there are several sub-heads, namely:

*a.* Topography.
*b.* Geological structure.
*c.* Evaporation.
*d.* Vegetation.
*e.* Ground water.

The first of these, (*a*) "Topography," has, of course, a marked effect in changing rainfall to run-off. Steep slopes, as found in mountain areas, run off a greater percentage of the rainfall than gentle slopes, such as found in the foothills, and gentle slopes run off more than lands, such as prairies, which often have very slight slopes. Each drainage basin has been described in more or less detail so that it is unnecessary to state that all types of topography are met with in each of the basins mentioned in this report.

The (*b*) "Geological structure" of an area no doubt has some part in determining its run-off, but authorities seem to differ as to its importance. The areas under consideration in this report are, as far as run-off is affected, fairly similar in their geological structure and therefore need not be extensively commented upon. The upper beds of the mountain regions are for the most part of limestone series, although others are of quartzite, which in most cases has little or no soil cover. The foothills, on the other hand, are principally of sandstone and shale series which in general has an abundant soil cover. Full details of the geology of this whole area may be found in many reports on the geological features of the Rocky Mountains, or of various areas published by the Geological Survey of Canada.

The (*c*) "Evaporation" over an area is one of the most important points to be considered in a study of the run-off of precipitation. It depends on a great many other factors and is here taken to include direct evaporation into the air and indirect evaporation or absorption by plant growth. The amount of water evaporated into the air of course depends on the temperature, velocity of winds and atmospheric pressure. Over the area covered by this report it is known that the temperature during both May and June of 1915 was below normal, and in June

up to the date of the heavy rains there were few warm days. Therefore it is assumed that from the point of temperature the evaporation would be low. The velocity of winds over the area from the records at Calgary and Edmonton was little above 1914 and probably about normal. Atmospheric pressure at Banff, Calgary and Edmonton was above that of the four previous years, and the effects that this condition would produce would favour low evaporation. The humidity was also greater in 1915 than in the two previous years. The absorption by plant growth would apparently not be as great in June as usual, as it was stated at that time that crops were backward, owing to the cool weather and great amount of rain. If the conditions were such on the prairies, where the mean temperature was about five degrees above the foothills and mountain section and the precipitation from two to eight inches less, it can be assumed that they were at least similar in the foothills and mountains.

From the foregoing it can be readily seen that the evaporation for May and June can be assumed as being below the average for those months, thus allowing more that the usual amount of rainfall to become ground water and run-off.

The (*d*) "Vegetation" of an area has a marked effect on the run-off and evaporation. A cover of trees with their matted roots forms an effective pondage for quantities of ground water and retards the run-off to a noticeable extent. They also protect the surface of the ground from the direct rays of the sun, reducing to some slight extent direct evaporation from the soil. The presence of vegetation also has the effect of increasing evaporation by absorption into plant life and by exposure to the air of large quantities of moisture contained in leaves, much of which is evaporated.

It is seen, therefore, that forests and their plant life adjuncts have a retarding rather than an accelerating effect in converting precipitation into run-off. The foothills and mountains of Alberta are not well covered with tree growth owing to the repeated fires in past years. Better protection from fires is aiding the gradual development of forest cover, and as this cover extends, the effects of heavy rains should not be felt as quickly nor as markedly.

A proportion of all precipitation finds its way into the ground and forms that little known or understood part of hydrography called (*e*) "Ground water." The earth's surface is penetrated to great depths by ground waters which are constantly in motion. Towards the surface these waters are affected in their motion by various conditions, such as changes in atmospheric pressure and temperature. In addition to the above, precipitation, which is the source of ground water, plays an important part in such motion. The motions of ground or sub-surface water, like surface waters, are vertical and horizontal, and the vertical motion is greatly affected by rainfall. The horizontal or sub-surface flow of ground water is a fairly constant factor, that is, the channels remain of a more or less constant size, and the only increase in flow is caused by increase of head. The upper soils of the earth are much more open than the lower and especially is this true where there is a good growth of plant life and these parts are subject to great changes in position of the ground water. When heavy rains take place the upper soils absorb great quantities of water which gradually filter through the lower strata. If the rains are continuous it can be seen that sooner or later the surface stratum absorbs all the water it possibly can, and as the lower strata cannot carry away the rain as fast as it falls most of it will have to run off on the surface.

### *Division of Report.*

This report has been divided into seven parts corresponding to the drainage basins affected. These parts are as follows:

Part 1.—General Introduction.
Part 2.—South Saskatchewan River Drainage Basin.
Part 3.—Oldman River Drainage Basin.
Part 4.—Bow River Drainage Basin.
Part 5.—Red River Drainage Basin.
Part 6.—North Saskatchewan River Drainage Basin.
Part 7.—Athabaska River Drainage Basin.

TEMPERATURE AND PRECIPITATION at a number of METEOROLOGICAL STATIONS IN ALBERTA, for June 1915.

TABLE A.1

| DRAINAGE BASIN. | STATION. | Yrs. Observations. | Temperature. | | | Precipitation. | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Mean. | Difference from Average. | Mean daily range. | Amount. | Difference from Average. | Heaviest fall in Month. | Date of heaviest fall. |
| Oldman River | Coleman | ..... | ..... | ..... | ..... | 3.16 | ..... | 0.60 | 25 |
| | Lundbreck | 2 | 48.5 | —3.1 | 21.9 | 6.83 | ..... | 1.39 | ..... |
| | Cowley | ..... | ..... | ..... | ..... | 6.80 | ..... | 1.20 | 25 |
| | Maycroft | ..... | ..... | ..... | ..... | 6.32 | ..... | 1.65 | 25 |
| | Pincher Creek | 16 | 51.7 | —3.1 | 18.4 | 7.68 | +4.63 | 1.59 | ..... |
| | Macleod | 19 | 54.9 | —2.5 | 25.9 | 3.24 | +0.61 | 0.98 | ..... |
| | Lyndon | ..... | ..... | ..... | ..... | 11.78 | ..... | 3.00 | 26 |
| Little Bow River | Claresholme | ..... | ..... | ..... | ..... | 4.88 | ..... | 1.20 | 25 |
| | Nanton | ..... | ..... | ..... | ..... | 9.26 | ..... | 2.35 | 25 |
| Bow River | Banff | 20 | 50.2 | —1.1 | 24.1 | 6.05 | +2.86 | 1.97 | 25 |
| | Lake Louise | 1 | 46.8 | ..... | 24.7 | 5.70 | ..... | 2.17 | ..... |
| | Calgary | 31 | 54.1 | —1.1 | 23.0 | 4.02 | +0.75 | 0.66 | ..... |
| | Okotoks | 3 | 51.2 | ..... | 17.7 | 5.59 | ..... | 1.08 | ..... |
| | Pekisko | 5 | 47.2 | ..... | 26.4 | 10.02 | ..... | 1.74 | ..... |
| | Jumpingpound | ..... | ..... | ..... | ..... | 8.94 | ..... | 2.22 | 2 |
| | Lineham | ..... | ..... | ..... | ..... | 9.19 | ..... | ..... | ..... |
| Red Deer River | Hillsdown | 11 | 52.7 | —3.7 | 19.7 | 5.25 | +0.85 | 0.77 | ..... |
| | Red Deer | 15 | 51.6 | —2.3 | 21.4 | 4.81 | +0.18 | 2.11 | ..... |
| | Lacombe | 8 | 52.6 | ..... | 23.0 | 8.28 | ..... | 2.20 | ..... |
| | Springdale | 3 | 50.9 | ..... | 22.9 | 8.00 | ..... | 1.37 | ..... |
| N. Saskatchewan River | Bismark | ..... | ..... | ..... | ..... | 7.89 | ..... | 1.59 | 2 |
| | Ponoka | ..... | ..... | ..... | ..... | 5.12 | ..... | 1.95 | 26 |
| | Edmonton | 33 | 54.2 | —3.1 | 21.1 | 5.46 | +2.05 | 1.13 | ..... |
| Athabaska River | Mountain Park | 1 | 45.2 | ..... | 21.8 | 12.26 | ..... | 3.35 | ..... |
| | Wabasca | 1 | 55.9 | ..... | 24.5 | 2.08 | ..... | 0.93 | ..... |
| | Athabaska | 12 | 52.6 | —2.9 | 25.9 | 2.46 | —1.10 | 1.06 | ..... |

MONTHLY MEAN TEMPERATURE AND MEAN DIFFERENCE FROM AVERAGE FOR YEAR AT SEVERAL ALBERTA METEOROLOGICAL STATIONS from October, 1914 to September, 1915.

TABLE A.2

| STATION. | 1914. Oct. | Nov. | Dec. | 1915. Jan. | Feb. | Mar. | Apr. | May | June | July. | Aug. | Sept. | Monthly Mean. | Diff. from Ave'g. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lundbreck | 38.8 | 30.1 | 10.9 | ..... | 24.0 | 30.1 | 44.1 | 44.0 | 48.5 | 53.0 | 60.0 | 45.0 | 38.95 | ..... |
| Pincher Creek | 42.0 | 33.9 | 15.0 | 24.2 | 26.8 | 33.5 | 47.1 | 47.8 | 51.7 | 58.0 | 64.0 | 47.0 | 40.91 | +1.75 |
| Macleod | 42.8 | 34.7 | 9.6 | 19.4 | ..... | 31.5 | 49.6 | 51.1 | 54.9 | 61.0 | 67.0 | 49.0 | 42.78 | —0.70 |
| Calgary | 44.6 | 32.0 | 13.0 | 19.8 | 24.4 | 33.0 | 49.3 | 49.7 | 54.1 | 59.0 | 65.0 | 49.0 | 41.07 | +3.40 |
| Banff | 41.4 | 28.7 | 9.7 | 16.0 | 23.5 | 32.2 | 44.4 | 46.4 | 50.2 | 56.0 | 60.0 | 46.0 | 37.90 | +2.16 |
| Lake Louise | ..... | ..... | ..... | ..... | 14.5 | 25.3 | 38.2 | 44.2 | 46.8 | 51.0 | 56.0 | 41.0 | 39.43 | ..... |
| Red Deer | 40.7 | 25.9 | 8.1 | 10.4 | 20.0 | 27.0 | 44.9 | 48.5 | 51.6 | 55.0 | 63.0 | 46.0 | 36.76 | +0.52 |
| Mountain Park | ..... | ..... | ..... | ..... | ..... | 27.2 | 32.4 | 41.0 | 45.2 | ..... | ..... | 36.0 | 36.36 | ..... |
| Edmonton | 43.3 | 29.8 | 9.0 | 10.8 | 15.3 | 30.5 | 48.8 | 52.2 | 54.2 | 59.0 | 65.0 | 48.0 | 38.83 | +1.48 |

MONTHLY PRECIPITATION AND DIFFERENCE FROM PERIOD AVERAGE AT SEVERAL ALBERTA METEOROLOGICAL STATIONS from October, 1914 to September, 1915.

| STATION. | 1914. Oct. | Nov. | Dec. | 1915. Jan. | Feb. | Mar. | Apr. | May | June. | July. | Aug. | Sept. | Total for Period. | Diff. from Ave'g. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lundbreck | 4.90 | 2.00 | 0.55 | ..... | 0.73 | 1.43 | 0.87 | 5.12 | 6.83 | 4.54 | 1.32 | 1.50 | 29.79 | ..... |
| Pincher Creek | 3.79 | 1.30 | 0.70 | 1.03 | 1.73 | 1.24 | 1.80 | 3.37 | 7.68 | 4.01 | 1.24 | 2.31 | 30.20 | +10.76 |
| Macleod | 2.46 | 1.66 | 2.00 | 1.05 | ..... | 1.14 | 0.12 | 2.32 | 3.24 | 4.40 | 2.26 | 0.61 | 21.26 | +5.69 |
| Calgary | 1.82 | 2.73 | 0.75 | 0.40 | 0.23 | 0.07 | 0.46 | 3.13 | 4.02 | 3.98 | 0.68 | 2.33 | 20.60 | +4.35 |
| Banff | 1 69 | 2.60 | 0.28 | 1.06 | 0.75 | 0.30 | 1.00 | 2.34 | 6.05 | 3.96 | 1.47 | 2.69 | 24.19 | +3.07 |
| Lake Louise | ..... | ..... | ..... | ..... | 0.88 | 0.43 | 1.66 | 1.48 | 5.70 | 4.56 | 1.29 | 2.28 | 18.28 | ..... |
| Red Deer | 1.44 | 1.53 | 1.50 | 0.95 | 0.00 | 0.01 | 0.48 | 4.30 | 4.81 | 3.36 | 0.69 | 2.40 | 21.47 | —1.08 |
| Mountain Park | ..... | ..... | ..... | ..... | ..... | 2 13 | 2.68 | 4.55 | 12.26 | ..... | ..... | 2.54 | 24.16 | ..... |
| Edmonton | 1.07 | 0 85 | 1.49 | 1.04 | 0.02 | 0.10 | 0.92 | 1.30 | 5.46 | 4.24 | 3.24 | 0.97 | 20.70 | +2 50 |

ANNUAL PRECIPITATION FOR SEVERAL METEOROLOGICAL STATIONS IN ALBERTA for years 1906 to 1915.

TABLE A.3

| Station. | 1906. | 1907. | 1908. | 1909. | 1910. | 1911. | 1912. | 1913. | 1914. | 1915. | Mean for period. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Pincher Creek | ..... | ..... | ..... | 20.22 | ..... | ..... | ..... | ..... | ..... | 26 39a | 24 78 |
| Macleod | ..... | 12 37 | 18.13 | 23 39 | ..... | 20 54 | 12 73 | 10 58 | 20 50 | 16 31a | 16 81 |
| Calgary | 16 24 | 14 96 | 18.25 | 16 03 | 12 03 | 19 37 | 21 40 | 17 04 | 17 71 | 18 09 | 17 11 |
| Banff | 14 58 | 23.56 | 21.09 | 10 19 | 16 32 | 19 16 | 20 51 | 17 36 | 17 69 | 21 87a | 18 23 |
| Red Deer (Hillsdown) | ..... | 17.51 | ..... | 17 26 | 21 25 | 23 40 | 20 37 | ..... | 26 73 | 19 44a | 20 86 |
| Edmonton | ..... | 16.02 | ..... | 17 88 | 14 03 | 20 66 | 20 20 | 19 55 | 25 29 | 18 25 | 18 55 |

a December 1915 reports not available.

## SOUTH SASKATCHEWAN RIVER DRAINAGE BASIN.

### *General Description.*

This stream is formed by the junction of the Oldman and Bow Rivers at a point known as the Grand Forks in Alberta. It flows in a northeasterly direction through the eastern part of Alberta and almost across Saskatchewan where it joins the North Saskatchewan River forming the Saskatchewan River proper.

The river is joined by the Sevenpersons River near Medicine Hat, the Red Deer River just after it crosses into Saskatchewan and farther down by Swiftcurrent Creek, the Red Deer being the only tributary with much of a flow.

The whole of the drainage area of this river is prairie and from it there was little run-off in June to augment the flood discharges of the Oldman, Bow and Red Deer Rivers. It is therefore not necessary in this report to go into the causes of the flood, precipitation or temperature in the main drainage area.

### *Former Floods.*

This stream has been subject to floods of some magnitude on a number of occasions in the past few years, practically every flood on the three main branches causing floods or high water on the main stream. At Saskatoon on June 17, 1908, the river reached a stage of 26.9 feet or 6 feet higher than in 1915. It is assumed by the city of Saskatoon that the flood of 1908 was the highest known at that point. At Medicine Hat it is believed that the flood of 1902 was the highest although no definite data are available. In 1908 the stream rose to within sixteen inches of the 1902 record. The 1908 record was 2142.68 feet above sea level (Canadian Pacific Railway datum). In 1897 a very high flood also occurred.

### *Progress of the Flood.*

Plate B 1 shows the progress of the crest of the flood from the lowest stations on the three branches to the lowest station (Saskatoon) on the main river.

It is difficult to determine what stream caused the peak at the lower stations. For instance, it is hard to say if the maximum at Medicine Hat was caused by the waters of the Bow or Oldman River except by comparison of discharges. From them it would seem that the peak flood was caused by the Bow River and that it took twenty-four hours for the crest to pass the 168 miles between Bassano and Medicine Hat, at a rate of 7 miles per hour. The crest of the flood from the Oldman River apparently reached Medicine Hat about 9 a.m. June 28, or at a rate of approximately 7 miles per hour. From Medicine Hat to Saskatoon, a distance of 400 miles, there is a difference of 108 hours for crests which would allow the upper water to travel at a rate of about 4 miles an hour. The crest from Medicine Hat, however, apparently reached Saskatoon 18 hours earlier or at a rate of 4.44 miles per hour followed by the crest from the Red Deer River. It took 131 hours for the Red Deer crest to travel 600 miles or at a rate of 4.6 miles per hour. Hourly gauge heights and discharges during the flood are given in Table B 2 for Medicine Hat and B 3 for Saskatoon.

### *Damage.*

There was little damage to property along this stream and there was no loss outside of some economic* losses at Medicine Hat and Saskatoon.

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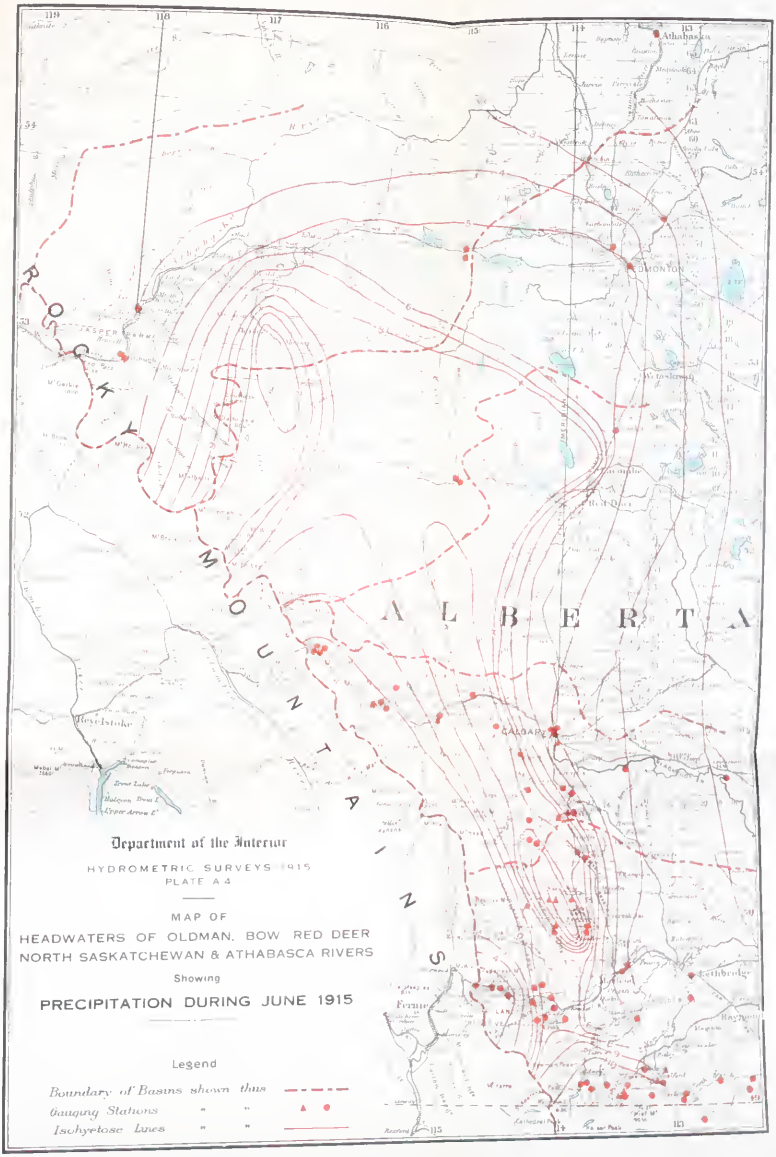
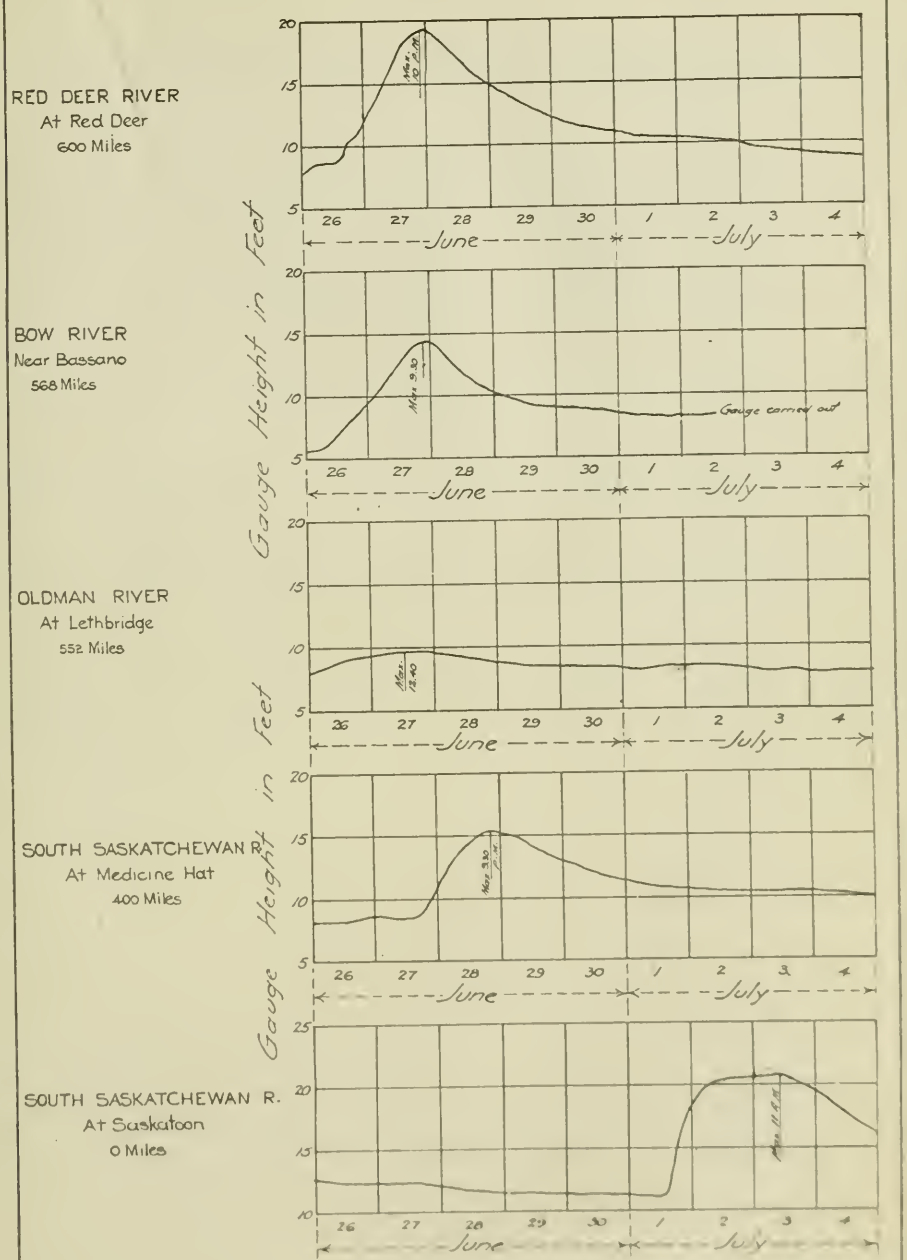
*The damage caused by floods may be divided into two classes—actual and economic. Under "actual damage" are classed direct physical losses that are tangible and apparent, a portion of which may be measured in terms of the expenditure required to restore the thing damaged to approximately its condition before the flood; the rest may be measured in terms of the monetary value of the thing lost or destroyed. Under the classification "economic damage" are placed those indirect losses that are, in a sense, presumptive. These include losses due to suspension of business and social relations in the flooded area and in places having such relations with that area; losses due to decreased confidence in the security of the localities flooded—especially the towns and cities, which may be termed lost prestige; losses due to general depression and decreased initiative throughout the flooded districts; and losses due to a materially decreased property valuation. For a former use of these terms see page 86 of the Water-Supply, Paper 334, the Ohio Valley Flood of March-April, 1913, published by the U. S. Geological Survey.


Department of the Interior
HYDROMETRIC SURVEYS 1915
PLATE A 4
MAP OF
HEADWATERS OF OLDMAN, BOW RED DEER
NORTH SASKATCHEWAN & ATHABASCA RIVERS
Showing
PRECIPITATION DURING JUNE 1915
Legend
Boundary of Basins shown thus
Gauging Stations " "
Isohyetose Lines " "
ROCKY MOUNTAINS
ALBERTA
JASPER
EDMONTON
CALGARY
Athabasca
Lethbridge
Fernie
Hazelstine
Upper Arrow L.

DEPARTMENT OF THE INTERIOR. HYDROMETRIC SURVEYS—1915-PLATE B1.




FLOOD HYDROGRAPHS (GAUGE HEIGHTS) FOR FIVE STATIONS IN SOUTH SASKATCHEWAN RIVER DRAINAGE BASIN, DURING JUNE AND JULY, 1915.

HOURLY GAUGE HEIGHT AND DISCHARGE of South Saskatchewan River at Medicine Hat, for Flood, June-July, 1915.

TABLE B.2

| Hour. | June 27. | | June 28. | | June 29. | | June 30. | | July 1. | | July 2. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 8.47 | 30,350 | 11.15 | 49,200 | 15.23 | 89,220 | 12.85 | 63,990 | 11.48 | 51,770 | 10.72 | 45,920 |
| 2 | 8.45 | 30,220 | 11.50 | 51,930 | 15.20 | 88,880 | 12.75 | 63,050 | 11.45 | 51,540 | 10.70 | 45,770 |
| 3 | 8.45 | 30,220 | 11.85 | 54,760 | 15.15 | 88,370 | 12.70 | 62,580 | 11.42 | 51,310 | 10.68 | 45,620 |
| 4 | 8.44 | 30,160 | 12.20 | 57,880 | 15.10 | 87,740 | 12.60 | 61,640 | 11.37 | 50,920 | 10.67 | 45,540 |
| 5 | 8.43 | 30,090 | 12.55 | 61,170 | 15.05 | 87,170 | 12.55 | 61,170 | 11.33 | 50,600 | 10.65 | 45,000 |
| 6 | 8.42 | 30,030 | 12.90 | 64,460 | 15.00 | 86,600 | 12.45 | 60,230 | 11.30 | 50,370 | 10.63 | 45,240 |
| 7 | 8.42 | 30,030 | 13.30 | 68,430 | 14.90 | 85,490 | 12.40 | 59,760 | 11.25 | 49,980 | 10.62 | 45,170 |
| 8 | 8.41 | 29,960 | 13.55 | 70,960 | 14.80 | 84,380 | 12.30 | 58,820 | 11.20 | 49,590 | 10.60 | 45,020 |
| 9 | 8.42 | 30,030 | 13.75 | 72,980 | 14.50 | 81,050 | 12.20 | 57,880 | 11.15 | 49,200 | 10.59 | 44,950 |
| 10 | 8.45 | 30,220 | 13.90 | 74,490 | 14.35 | 79,380 | 12.15 | 57,410 | 11.13 | 49,050 | 10.58 | 44,870 |
| 11 | 8.50 | 30,540 | 14.10 | 76,610 | 14.20 | 77,720 | 12.10 | 56,940 | 11.10 | 48,820 | 10.57 | 44,800 |
| 12 | 8.55 | 30,860 | 14.25 | 78,280 | 14.05 | 76,060 | 12.05 | 56,470 | 11.06 | 48,510 | 10.55 | 44,650 |
| 13 | 8.65 | 31,520 | 14.45 | 80,500 | 13.92 | 74,690 | 12.00 | 56,000 | 11.03 | 48,280 | 10.55 | 44,650 |
| 14 | 8.73 | 32,040 | 14.65 | 82,720 | 13.80 | 73,480 | 11.95 | 55,580 | 11.00 | 48,050 | 10.53 | 44,500 |
| 15 | 8.83 | 32,680 | 14.80 | 84,380 | 13.70 | 72,470 | 11.90 | 55,170 | 10.97 | 47,820 | 10.52 | 44,430 |
| 16 | 8.93 | 33,340 | 14.95 | 86,040 | 13.60 | 71,460 | 11.85 | 54,760 | 10.93 | 47,510 | 10.51 | 44,350 |
| 17 | 9.05 | 34,120 | 15.08 | 87,510 | 13.50 | 70,450 | 11.80 | 54,350 | 10.90 | 47,280 | 10.50 | 44,280 |
| 18 | 9.20 | 35,110 | 15.20 | 88,880 | 13.42 | 69,640 | 11.77 | 54,100 | 10.87 | 47,050 | 10.50 | 44,280 |
| 19 | 9.30 | 35,780 | 15.28 | 89,790 | 13.35 | 68,940 | 11.73 | 53,780 | 10.85 | 46,900 | 10.50 | 44,280 |
| 20 | 9.50 | 37,140 | 15.30 | 90,020 | 13.25 | 67,920 | 11.69 | 53,450 | 10.82 | 46,670 | 10.50 | 44,280 |
| 21 | 9.80 | 39,250 | 15.30 | 90,020 | 13.18 | 67,220 | 11.65 | 53,120 | 10.80 | 46,520 | 10.50 | 44,280 |
| 22 | 10.15 | 41,740 | 15.30 | 90,020 | 13.10 | 66,410 | 11.60 | 52,720 | 10.77 | 46,300 | 10.50 | 44,280 |
| 23 | 10.50 | 44,280 | 15.28 | 89,790 | 13.00 | 65,400 | 11.56 | 52,400 | 10.75 | 46,140 | 10.50 | 44,280 |
| 24 | 10.80 | 46,520 | 15.25 | 89,450 | 12.92 | 64,650 | 11.53 | 52,170 | 10.73 | 46,000 | 10.50 | 44,280 |
| Mean | 33,593 | | 76,261 | | 76,866 | | 56,981 | | 48,591 | | 44,780 | |
| Run-off acre-feet | 66,615 | | 151,226 | | 152,425 | | 112,990 | | 96,356 | | 88,799 | |
| Maximum | 46,520 | | 90,020 | | 89,220 | | 63,990 | | 51,770 | | 45,920 | |
| Minimum | 29,960 | | 49,200 | | 64,650 | | 52,170 | | 46,000 | | 44,280 | |

HOURLY GAUGE HEIGHT AND DISCHARGE of South Saskatchewan River at Saskatoon, for Flood, 1915.

TABLE B.3

| Hour. | July 1. | | July. 2 | | July 3. | | July 4. | | July 5 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 11.25 | 39,200 | 18.45 | 100,500 | 20.70*a* | 114,000 | 19.57*a* | 100,500 | 16.02*a* | 71,300 |
| 2 | 11.22*a* | 38,100 | 18.90 | 103,000 | 20.75 | 114,000 | 19.33*a* | 98,300 | 15.93*a* | 70,700 |
| 3 | 11.20 | 38,050 | 19.00 | 104,100 | 20.78*a* | 114,000 | 19.10 | 96,000 | 15.84*a* | 70,300 |
| 4 | 11.20*a* | 38,650 | 19.20 | 105,500 | 20.80 | 114,000 | 19.00*a* | 95,000 | 15.76*a* | 69,700 |
| 5 | 11.20 | 38,650 | 19.40 | 106,800 | 20.80*a* | 114,100 | 18.90*a* | 94,000 | 15.67*a* | 69,100 |
| 6 | 11.15*a* | 38,650 | 19.65 | 108,500 | 20.80*a* | 114,100 | 18.78*a* | 93,000 | 15.58*a* | 68,500 |
| 7 | 11.10 | 38,400 | 19.83 | 109,600 | 20.82*a* | 114,100 | 18.68 | 91,700 | 15.50 | 67,800 |
| 8 | 11.08*a* | 38,300 | 20.30 | 112,600 | 20.85 | 114,100 | 18.46*a* | 90,100 | 15.42*a* | 67,500 |
| 9 | 11.07 | 38,250 | 20.18 | 111,900 | 20.85 | 114,100 | 18.25 | 88,300 | 15.34*a* | 66,600 |
| 10 | 11.12 | 38,500 | 20.23 | 112,100 | 20.85*a* | 114,100 | 18.16*a* | 87,500 | 15.26*a* | 66,100 |
| 11 | 11.12*a* | 38,500 | 20.26 | 112,500 | 20.85 | 114,100 | 18.00*a* | 86,200 | 15.18*a* | 65,600 |
| 12 | 11.12*a* | 38,500 | 20.33 | 112,800 | 20.80 | 113,500 | 17.84 | 85,000 | 15.10 | 65,000 |
| 13 | 11.16*a* | 38,700 | 20.38 | 113,000 | 20.73*a* | 112,500 | 17.70*a* | 83,600 | 15.08*a* | 64,900 |
| 14 | 11.22 | 39,000 | 20.55 | 114,000 | 20.67*a* | 111,500 | 17.55*a* | 82,500 | 15.06*a* | 64,800 |
| 15 | 11.54*a* | 42,000 | 20.46 | 113,000 | 20.60 | 111,000 | 17.40 | 81,300 | 15.05 | 64,750 |
| 16 | 12.15 | 48,000 | 20.46 | 113,000 | 20.56 | 110,500 | 17.21*a* | 80,000 | 15.02*a* | 64,600 |
| 17 | 13.30 | 59,000 | 20.50 | 113,500 | 20.50*a* | 110,000 | 17.02*a* | 78,500 | 15.00 | 64,500 |
| 18 | 14.28 | 68,000 | 20.53*a* | 113,800 | 20.40*a* | 108,800 | 16.84*a* | 77,000 | 14.98*a* | 64,400 |
| 19 | 14.97*a* | 74,000 | 20.57*a* | 114,000 | 20.30*a* | 107,800 | 16.66*a* | 75,900 | 14.97*a* | 64,350 |
| 20 | 15.75*a* | 80,100 | 20.60 | 114,000 | 20.20 | 106,800 | 16.47 | 74,500 | 14.96*a* | 64,300 |
| 21 | 16.47 | 86,000 | 20.60*a* | 114,000 | 20.10*a* | 105,700 | 16.38*a* | 74,200 | 14.95*a* | 64,250 |
| 22 | 16.96 | 89,600 | 20.60 | 114,000 | 20.00*a* | 104,900 | 16.29*a* | 73,200 | 14.94*a* | 64,200 |
| 23 | 17.70 | 95,000 | 20.62*a* | 114,000 | 19.90*a* | 103,700 | 16.20*a* | 72,500 | 14.93*a* | 64,150 |
| 24 | 18.10 | 98,000 | 20.65 | 114,000 | 19.80 | 103,000 | 16.11*a* | 72,000 | 14.92*a* | 64,100 |
| Total | 1,279,150 | | 2,664,200 | | 2,664,400 | | 2,030,800 | | 1,591,500 | |
| Mean for Day | 53,298 | | 111,008 | | 111,017 | | 84,617 | | 66,312 | |
| Run-off, acre-feet | 105,690 | | 220,129 | | 220,147 | | 167,796 | | 131,497 | |

*a* Gauge height interpolated.

## OLDMAN RIVER DRAINAGE BASIN.

### *General Description.*

The Oldman River is the largest of the two streams which on their junction form the South Saskatchewan River.

The main river is formed between the Rocky Mountains and Livingstone Range by the junction of Livingstone River, Northwest Branch, West Branch and Race-horse Creek. It first flows southeasterly until joined by the Crowsnest and Castle Rivers and then flows in a general eastern direction to its junction with the Bow River. There are a number of small tributaries joining the main stream and two large ones, the Belly River and the St. Mary River. These two streams empty into the river between Macleod and Lethbridge.

The territory drained by this stream consists of mountains, foothills and prairie. The mountain region is quite extensive and is divided into the Main Range and the Livingstone Range of the Rocky Mountains. There is a good forest cover on many parts of the mountains and foothills, but much of the Livingstone Range and some parts of the Rockies are precipitous and bare of tree growth. On the higher peaks, considerable amounts of snow collect and thus the streams are subject to high water caused by melting snows during the heat of the summer and in the early spring.

The foothills are partially prairie and partially tree covered but do not consist of muskegs like large parts of the drainage areas of streams farther north. This portion is therefore not subject to such rapid run-offs as a muskeg country. Floods of exceptional magnitude only occur after exceptionally heavy rains.

*Former Floods.*

Records of former floods in this basin are not very extensive and it is only known that such floods occurred in 1897, 1899, 1902 and 1908, that of 1908 probably being the greatest this basin ever witnessed. At that time it has been estimated that the discharge at Lethbridge was 120,000 sec.-feet. No reliable data are available for this flood at Macleod or above that point, owing to the complete change of channel at most points where such data were obtained. At Macleod in May 1908 4.7 inches of rain fell, and in June, 6.8 inches as compared with 2.3 and 3.2 inches in 1915.

*Causes of Flood of June, 1915.*

During the storage period of 1914–15 there was not a very heavy precipitation except in October, 1914. This, however, came in the form of snow, and most of it went to run-off before it soaked into the ground to any depth. Therefore there was not very much ground water in storage or snow on the mountains when the rains of May started. During May from 2 to 6 inches of rain fell over most of this drainage area, and early in June a further amount fell, about equalling the total May precipitation. These rains, which took place almost daily, kept the atmosphere cool enough to stop any great amount of evaporation, so that the ground was thoroughly sodden by June 24 when the exceptionally heavy rains started and continued until June 27. Within this time a fall of 3 inches took place in a single day at Lyndon in this basin and as much as 1.6 inches at other points. This exceptional rain, which fell heaviest north of the Crowsnest Pass in the foothills, of course, could not be absorbed by the ground and rapidly passed into the drains, causing the high water on the Oldman River throughout its entire course. (See Introduction on Precipitation and Temperature.)

*Progress of Flood.*

The passage of the crest of the flood is shown in Plate B. 1. but it is impossible to give any definite data as to the time the crest took to pass down the stream, owing to the fact that the time of the highest water at the upper station is not known.

The following table gives date, approximate time, maximum stage and corresponding discharge at a number of stations on streams in this basin:

| Stream. | Station. | Date. | Crest. | | Discharge. |
|---|---|---|---|---|---|
| | | | Time. | Gauge Height. | |
| | | | | *Feet.* | *Sec.-ft.* |
| Crowsnest River | Lundbreck | June 26 | Noon | 3.73 | 893 |
| Oldman River | Cowley | " 26 | p.m. | 4.90 | 4,910 |
| Castle River | Cowley | " 25 | p.m. | 4.30 | 2,460 |
| Oldman River | Macleod | " 26-27 | Midnight | 8.40 | 10,280 |
| Willow Creek | Macleod | " 26 | | 9.28 | 3,959 |
| Belly River | Stand Off | " 26 | p.m. | 5.20 | 2,700 |
| St. Mary River | Lethbridge | " 26 | noon | 2.59 | 3,730 |
| Oldman River | Lethbridge | " 27 | 12.40 p.m. | 10.08 | 25,050 |

*Damage.*

The loss through the floods on the Oldman River were very small owing to the fact that the settlements are, with few exceptions, well above danger point.

## BOW RIVER DRAINAGE BASIN.

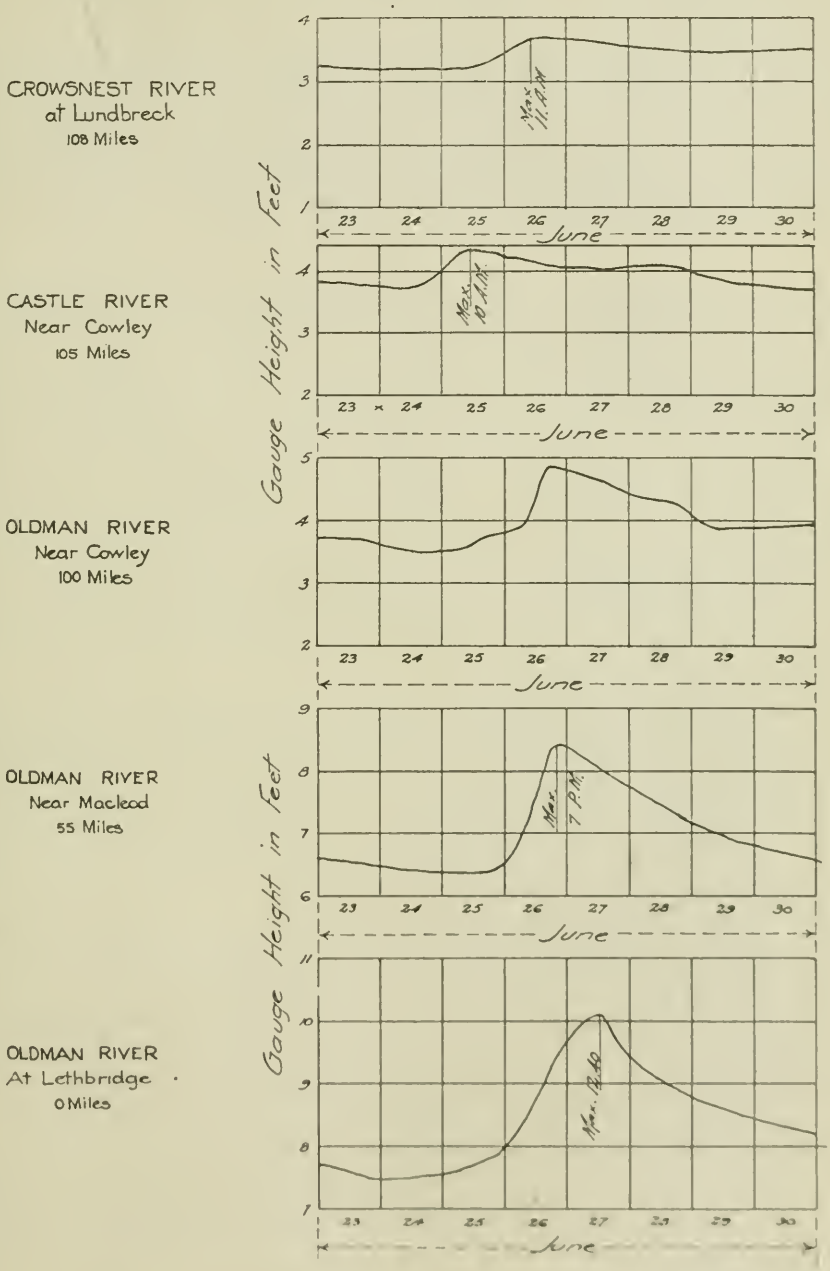
*General Description.*

The Bow River is the smallest in size of the two main branches of the South Saskatchewan River.

The river receives its main supply from the eastern slope of the Rocky Mountains in the Rocky Mountain Park of Canada and the adjacent territory, being augmented by the run-off of the foothills and, to some slight extent, further by that of the prairies through which it flows after leaving the wooded regions of the foothills and mountains.

The main stream rises in Bow Lake, north of the Kicking Horse Pass, at an elevation of 6,420 feet above sea level and flows in a southerly direction until it strikes the main line of the Canadian Pacific Railway at the junction of the Pipestone River when it flows easterly to the mouth of the Elbow River in the city of Calgary. From Calgary it bends to the south and then continues in a southeasterly direction to its confluence with the Oldman (Belly) River at the Grand Forks forming the South Saskatchewan River.

DEPARTMENT OF THE INTERIOR. HYDROMETRIC SURVEYS—1915—PLATE C1.




FLOOD HYDROGRAPHS (GAUGE HEIGHTS) FOR FIVE STATIONS IN OLDMAN RIVER DRAINAGE BASIN, DURING JUNE, 1915

The Bow has a number of tributaries which drain large tracts of mountain and foothill regions lying to the north and south of that drained by the main stream. In the mountain section the river is joined by the Pipestone and Cascade Rivers from the north and the Spray and Kananaskis from the south. In the foothills it is augmented by the flow of the Ghost River from the north and Jumpingpound Creek, and then in the prairie section by the Elbow and Highwood Rivers from the south. Below the junction of the Highwood River little drainage finds its way into the stream.

One of the most noticeable characteristics of the Bow River drainage basin is the number of lakes on the main stream and its more westerly branches. On the main river at its head there are the Bow and Hector Lakes; on Louise Creek there is Lake Louise; on the Spray there are two Spray Lakes; on the Cascade, Lake Minnewanka, and on the Kananaskis the two Kananaskis Lakes, besides innumerable small lakes on the above mentioned and other smaller streams. The presence of these lakes and the forest cover over most of the mountain and foothill region have the effect of regulating the flow to a great extent, but despite these facts, the stream is subject to floods of some magnitude.

*Former Floods.*

The report of former floods on the Bow River, published in the "Progress of Stream Measurements for 1912," and written by Mr. P. M. Sauder, Chief Hydrometric Engineer, is complete and is incorporated verbatim herewith:

"The most destructive flood ever witnessed in the Bow River valley since its settlement occurred about the middle of June, 1897. It was brought about by a cloudburst near Castle Mountain, near Canmore, following an abnormal rainfall in the early part of June.

"It is stated that the greatest flood occurred in 1879, but no data regarding this flood are available.

"Another flood occurred in 1884, but inhabitants who witnessed both floods agree that the water was a foot higher in 1897 than in 1884.

"Another flood which almost equalled that of 1897 in magnitude and destructiveness occurred in the early part of July, 1902.

"Though the hydrographic records of this office date back to 1894, no systematic and continuous record of the stages and discharge of Bow River was kept until 1908. These records extend, with the exception of the winter months during the first two years, to date, but the only flood of any account during this period occurred in July, 1909. The maximum discharge at the bridge on the Calgary and Edmonton Branch of the Canadian Pacific Railway, in 1909, was about 23,000 sec.-feet on July 7.

"It is very hard to estimate the loss, but in running over the damage to gardens, fences, trees, houses, lots, streets, sidewalks, destruction of bridges, railway tracks, etc., the statement is ventured that the loss caused by the flood in 1897 totalled nearly a quarter million dollars in the vicinity of Calgary alone.

"The rainfall for the 14th, 15th, 16th and 17th June, 1897, totalled 2.94, or practically three inches in three days and a half. During the night of the 17th the river which was already swollen rose very rapidly, and before midnight overflowed its banks and flooded several houses on the flats south and west of the Langevin bridge. The city fire brigade and the North West Mounted Police turned out with teams and waggons, which were kept going nearly all night moving women, children and furniture from the flooded districts. In all, about sixty families were driven out of their homes.

"The Eau Claire power plant was flooded, and the dam, which still exists, was in grave danger. One span of the Bow Marsh bridge, which was just above the present Louise bridge in the West End of Calgary, was carried away and floating down the river intact struck a pier of the old Langevin bridge and broke up. Several houses and the Calgary Hydraulic Company's flume were also carried away by the flood. The middle pier of the old Langevin bridge sank but the bridge was not carried out, though it could not be reached at all from the south side.

"The Calgary and Edmonton bridge was not seriously damaged, but the water broke through the grade on the south bank and carried away a part of it.

"A fine residence on the south bank of the river, about two miles below the city and belonging to Colonel Walker, was dropped into the river by the banks caving in, and was carried to destruction, the water having cut into the bank for fifty feet or more.

"The bridge over the river on the main line of the Canadian Pacific Railway east of Calgary was not damaged and the water did not break through the grade. The railway, however, suffered very heavy losses at several places west of Calgary. At Shaginappi Point the track was washed out and a long stretch of it had to be re-located. From Calgary to Canmore the track and bridges were damaged and carried out at several places. The mines at Anthracite were wholly submerged.

"Fish Creek was also very high and at the mouth of this stream Bow River was reported to be twelve to fourteen feet above low water mark.

"Highwood and Sheep Rivers were also very high and did a great deal of damage. The trails were in a fearful condition and the whole country seemed to be covered with water.

"A bountiful rainfall during the latter part of June, 1902, and an abnormal downpour during the first few days of July resulted in a second very destructive flood. During the night of July 4, the river overflowed the flats to the south and west of the Langevin bridge in Calgary, and

again the city fire brigade and North West Mounted Police came to the rescue of the unfortunate inhabitants with waggons and teams. Many barely escaped with their lives. The bridge was again cut off from the south by the flood and several buildings were damaged, but while the water was higher at this point than in 1897, the actual damage to property was not as great. Colonel Walker's barn had to be moved to save it from being carried away. A man named Wilson living on an island near the old Industrial School below the city had a narrow escape. He was rescued from the roof of his barn, which just showed above the water.

"The Canadian Pacific Railway again suffered much loss by grades and bridges being damaged and washed out. The water again broke through the grade south of the Calgary and Edmonton bridge, but the opening under the bridge on the main line east of the city again carried the floods. The Bow Marsh bridge was in grave danger but was saved by being lashed to its supports.

"The rainfall in Calgary for the month of May, 1902, was 8.90 inches, and in June 9.82 inches, while on July 4 and 5, 1.78 inches fell in twenty-four hours. The whole country was flooded and the Elbow and all tributaries of the Bow were exceedingly high.

"The records of this office indicate that at Langevin bridge the greatest height of the river in the 1902 flood was a couple of feet higher than in 1897, while the records of the Canadian Pacific Railway Division Engineer show that at the bridge on the main line east of Calgary it was several inches lower.

"Among the records of the office is an estimate of the maximum discharge at Langevin bridge during the 1897 flood of 54,000 sec.-feet. It is very difficult at this date with the data available to compute the discharge, but this estimate was made shortly after the flood and by experienced and intelligent engineers and is, no doubt, fairly accurate.

"The maximum flood discharge of Bow River at the Calgary and Edmonton bridge in 1897 would be 60,000 sec.-feet. The maximum discharge in 1902 did not quite reach this amount.

"History goes to show that Bow River is subject to very big floods, and in designing works, such as dams and bridges, a small amount at least should be added to the greatest known discharge. Between the mouth of Kananaskis River and Ghost River 40,000 sec.-feet should be allowed, between the mouth of Ghost River and Jumpingpound Creek, 50,000 sec.-feet; between the mouth of Jumpingpound Creek and Elbow River, 60,000 sec.-feet; between the mouth of Elbow River and Fish Creek, 70,000 sec.-feet; between the mouth of Fish Creek and Highwood River, 75,000 sec.-feet; and below Highwood River, 100,000 sec.-feet. This discharge averages 19 cu. ft. per sec. per sq. mile for the drainage area above Calgary, about 18 cu. ft. per sec. per sq. mile for the drainage area at the mouth of Highwood River. A run-off of 19 cu. ft. per sec. per sq. mile equals a depth of seven-tenths of an inch in twenty-four hours."

### *Causes of Flood in June, 1915.*

The flood of June, 1915, was caused almost entirely by the heavy and continuous rains of June 25 to 27, which extended over the whole drainage basin. During late May and early June the basin was subject to heavy rainfalls which on the peaks fell as snow, saturating the soil cover of the mountains and foothills almost to capacity, and at the same time keeping the atmosphere in a cloudy and cool condition, thus not allowing the sun to melt the winter stores of snow as usual and reserving them to be melted by the heavy and warm rains of June 25–27. Fortunately the snowfall during the winter of 1914–15 was well below normal and while on the higher peaks there probably was as much snow as usual at this time, at the lower altitudes there was probably less.

A study of the Bow River drainage above Calgary shows that 46% of the area is at an elevation of 6000 feet above sea level, 43% between 4000 and 6000 feet and only 12% below 4000 feet. The area above 6000 feet can be taken as above timber line, and as it is of a rock formation with little soil cover, can be assumed to be of an impermeable nature which would shed a very large percentage of the rainfall as it fell. Between 4000 and 6000 feet may be taken as the timbered area on which the cover varies from heavy growths of coniferous to light growths of deciduous trees. This area is one which retards the run-off unless the ground is sodden, as was the case during 1915 due to the rains and slow evaporation of late May and early June. Under these conditions a fairly high percentage of the rainfall would immediately become run-off. The area under 4000 feet is practically all prairie, and like that of between 4000 and 6000 feet was not in late June of 1915 in a fit condition to retard more than a small quantity of the precipitation. The run-off of the upper portions of this basin was rather high. Those streams which enter the Bow above the Kananaskis all drain areas which for the most part are above 6000 feet in elevation, so might be expected to discharge a considerable part of the rainfall at the time of the flood. Louise Creek, draining an area of eleven sq. miles reservoired by Lake Louise, had a mean discharge of 81 sec.-feet on June 26, and of 63 sec.-feet on June 27 to 30. This would be a run-off of 7.4 sec.-ft. per sq. mile on June 26, or a depth of 0.28 inches over the drainage area for a single day. The run-off of this stream could be expected to be low for a single day owing to the reservoir formed by the lake. The Bow at Lake Louise with a drainage area of 165 miles had a maximum daily mean discharge of 2,985 sec.-ft. on June 26, or 18 sec. ft. per sq. mile equal to 0.67 inches over the area. The Spray River at Banff with a drainage area of 225 sq. miles discharged 2300 sec.-ft., June 26, or 10 sec.-ft. per sq. mile, equal to 0.37 inches over the area. The Cascade was regulated to a certain extent by the dam and reservoir at Lake Minnewanka and the discharge was about the same as the Spray. The Kananaskis, with an area

of 390 sq. miles, discharged 5,380 sec.-ft., June 27, or 14 sec.-ft. per sq. mile, equal to 0.52 inches over the drainage area. The Ghost and Elbow Rivers drain areas which for the most part are above 4000 feet and they show the following flows for the mean maximum day; the Ghost on June 26 discharged 8,440 sec.-ft. or 22.5 sec.-ft. per sq. mile, equal to 0.84 inches over the area; the Elbow, on June 26, discharged 11,728 sec.-ft. or 25 sec.-ft. per sq. mile, equal to 0.93 inches over the area. Jumpingpound Creek, which drains an area of 185 sq. miles at an elevation of between 4000 and 6000 feet, with only a few square miles over 6000, had a maximum mean daily discharge of 5,784 sec.-ft. June 26, or 32 sec.-ft. per sq. mile, equal to 1.19 inches over the area. These records go to show that the greatest run-off took place from the area between 4000 and 6000 feet, or from the timbered section. This part of the drainage had little or no snow on it, therefore the run-off would be directly due to rainfall.

*Precipitation and Temperature.*

Meteorological stations are maintained at Lake Louise and Banff on the headwaters, and at Calgary, Pekisko, Okotoks and Brooks on the lower portions of the main stream or tributaries.

At Lake Louise (at an elevation 5,044 feet above sea level) the records for June show the mean temperature as 46.8 and the total precipitation as 5.70 inches, with a maximum for a single day of 2.17 inches. There were 18 days of rainfall with 0.01 inches or more and 12 fair days. At Banff (at an elevation of 4,542 feet) the mean temperature for June was 50.2, the total precipitation 6.05 inches, with a maximum fall of 1.97 inches. There were 20 days of rain and 10 fair days. These two stations would give the total average fall for the mountain region as being 5.88 inches, with a maximum fall for a single day of 2.07 inches and a mean temperature of 48.5 degrees. As both these stations are in the valley it may be assumed that for the higher elevations the precipitation was above this, and the temperature was lower.

The precipitation over the area between Calgary and Banff was rather heavy and probably was nearer the Banff records than those of Calgary. The rainfall, for instance, over the Jumpingpound catchment area, which is nearer to Calgary than to Banff, must have been greater than the mean of these two points. Assuming it as a mean of the heaviest fall at Banff and Calgary, it would be 1.32 inches and the run-off for the maximum day would therefore be 90% of the rainfall, which is exceptionally high. The area in the foothills is not covered by the meteorological records, and those of the border between the foothills and prairie show for this section a mean temperature for June of 50.8 degrees and a total precipitation of 6.54 inches and a mean daily maximum of 1.16 inches. The highest precipitation for the whole basin is shown at Pekisko, where the total for the month is 10.02 inches, with a maximum for a single day of 1.74 inches. Pekisko is just in the foothills and on the headwaters of Highwood River.

*Progress of the Flood.*

The progress of the flood is well shown by the graphs on plate D 1 and on table D4.

The streams entering the river in the mountain sections west of Banff began to rise June 25 and reached their maximum on June 26; those at and east of Banff in the same area reached their maximum June 27. The Ghost, Jumpingpound and Elbow began to rise during the night of June 25–26 and reached their maximum during the day of June 26. This allowed the floods on the lower streams to reach the main river and drain away before those of the upper streams reached the main river and more particularly the lower reaches of the main river. If conditions had been such that the western streams had emptied their maximum flows into the river at such a time as to allow their crest to be augmented by those of the lower streams, a vastly more destructive and serious flood would have resulted.

The crest on the main stream reached Lake Louise about 1 p.m. on June 26 and a stage of 9.54 feet, with an estimated discharge of 2,985 sec.-ft.; at Banff the crest arrived about 10.30 a.m. on June 27 and a stage of 10.39 feet, with an estimated discharge of 8,600 sec.-ft.; at Kananaskis about 10.30 a.m. on June 28 and a stage of 5.20 feet, with an estimated flow of 17,860 sec.-ft.; Calgary was reached at 5 p.m. June 26, with a stage of 11.15 (automatic record) or 12.50 (chain gauge record) and a flow of 39,780 sec.-ft. This is about 0.04 feet higher than the flood of 1902 and 1.95 feet lower than that of 1897. At Bassano the crest arrived at 8.30 p.m., June 27, with a gauge height of 14.70 feet and an estimated discharge of 69,156 sec.-ft.

The Pipestone reached its crest about 2 p.m., June 26, with a stage of 7.52 feet and a flow of 1,590 sec.-ft. The Spray reached its crest, June 26, with a stage of 7.55 feet and a flow of 2,318 sec.-ft. The Cascade, owing to the dam near Bankhead, did not reach its maximum until June 28, when the gates were opened. The Kananaskis was at its highest June 27, with a stage of 8.55 feet and a flow of 5,380 sec.-ft. The Ghost reached its peak June 26, with a stage of 10.17 feet and a discharge of 9,495 sec.-ft. Jumpingpound Creek about 8 p.m., June 26, reached a stage of 6.59 feet and a discharge of 5,784 sec.-ft. The Elbow about 6 p.m., June 26, was at a stage of 10.40 feet and a discharge of 13,850 sec.-ft. The Highwood River at High River reached its maximum stage about 6 a.m., June 26, at 9.85 feet with a flow of 9,300 sec.-ft. In addition to the flow through the river channel there were some 5,000 sec.-ft. diverted through Little Bow ditchand Lincham spillway at that time. Sheep River at Okotoks reached a stage of 10.80 feet, June 26, about 7 a.m., with a flow of 21,400 sec.-ft. The rate at which the flood travelled down the main river varied to some extent. From Lake Louise to Banff, a distance of 39 miles, it took 23 hours or at a rate of 1.7 miles per hour, the fall in this distance being about 11 feet per mile. The peak really reached Banff about 12 midnight, June 26–27 (it only

rose a few hundredths after that), in 11 hours, or at a rate of 3.5 miles per hour. From Banff to Kananaskis, a distance of 28.5 miles, with a fall of 12 feet per mile, the flood took 24 hours, or at the rate of 1.2 miles per hour. The actual rate probably is higher than this, as no doubt the Banff peak arrived some hours earlier than the maximum crest. As the peak at Calgary arrived earlier than at Kananaskis it cannot be taken into consideration. From Calgary to Bassano, a distance of 115 miles, with a fall of about 7 feet per mile, the peak took 27½ hours or at a rate of 4.2 miles per hour. In this stretch there are three dams which would retard the rate of flow to some extent. These figures would show that the maximum peak travelled at a very slow rate down the stream, which is accounted for by the fact that the flood waters from the head of the main stream were increased by those of the lower tributaries after the first crest passed. A flood originating west of Banff should reach Calgary in from 30 to 50 hours, or at a rate of 6 to 4 miles per hour.

*Stage and Discharge.*

Plate D 1 shows the maximum gauge height and a graphic representation of the rise and fall at all stations on the Bow during the flood. Table D 4 shows the mean daily gauge height and discharge at these stations for June, 1915, and Table D 3 and D 5 show the hourly gauge heights and discharges during the flood on the Bow and Elbow Rivers at Calgary.

The maximum gauge height and discharge for the principal stations in the drainage area have been given elsewhere in this report or may be obtained from the plates or tables.

The total discharge in acre-feet during the flood period at the various stations is given on Table D 6.

*Damages.*

The damage caused by the flood of 1915 in this drainage basin was not great. At Lake Louise the stream flooded its banks but did no damage to property. At Banff the only damage was to cellars which were flooded by the flooding of Whiskey Creek, a branch of Fortymile Creek. This damage would not exceed $1,000.00.

At Bankhead on the Cascade River the damage was quite extensive and included the destruction of the Canadian Pacific Railway dam and a traffic bridge at this point which it would cost at least $10,000.00 to replace.

A large number of logs were lost on the Ghost River, but otherwise the damage done was small until Calgary was reached. At Calgary the chief losses from the Bow and Elbow Rivers was to city property and totalled $47,840.00 divided as follows:

Public works, $17,400.00; sewers, $3,250.00; bridges, $15,870.00; parks, $1,020.00; waterworks, $7,800.00; and damage claims, $2,500.00. The damage to private property was not very great although a number of cellars of residences, etc., along both streams were flooded. The chief loser was the Eau Claire Lumber Company which lost about $30,000.00 worth of lumber and logs at Calgary and on the upper tributaries.

In addition to the above the Canadian Pacific Railway was put to considerable inconvenience and expense in keeping the diversion weir of their Western Section Irrigation Project clear of logs and debris.

Three lives were lost in Calgary during the flood. A workman, clearing debris from the new Mission (concrete) bridge over the Elbow, fell into the stream and was swept away. The second person to be drowned was a workman who was swept away with one of the spans of the Centre Street bridge. The third was an employee of the Canadian Pacific Railway who fell into the Bow while clearing the debris from their weir.

The Highwood River did not do any extensive amount of damage except to the intake of the Little Bow Ditch which would amount to perhaps $1,000.00, and some slight amount of damage to the mill a High River.

Sheep Creek flooded the town of Okotoks from one to two feet but the damage to private property was not over $2,000.00. The gas main of the Calgary Gas Company over Sheep Creek was destroyed, and, until temporarily replaced, cut off the supply to Calgary. In addition to this damage the Canadian Pacific Railway tracks along Sheep Creek were inundated and partly washed out. A rancher crossing Sheep River west of Okotoks was washed out of his wagon and drowned.

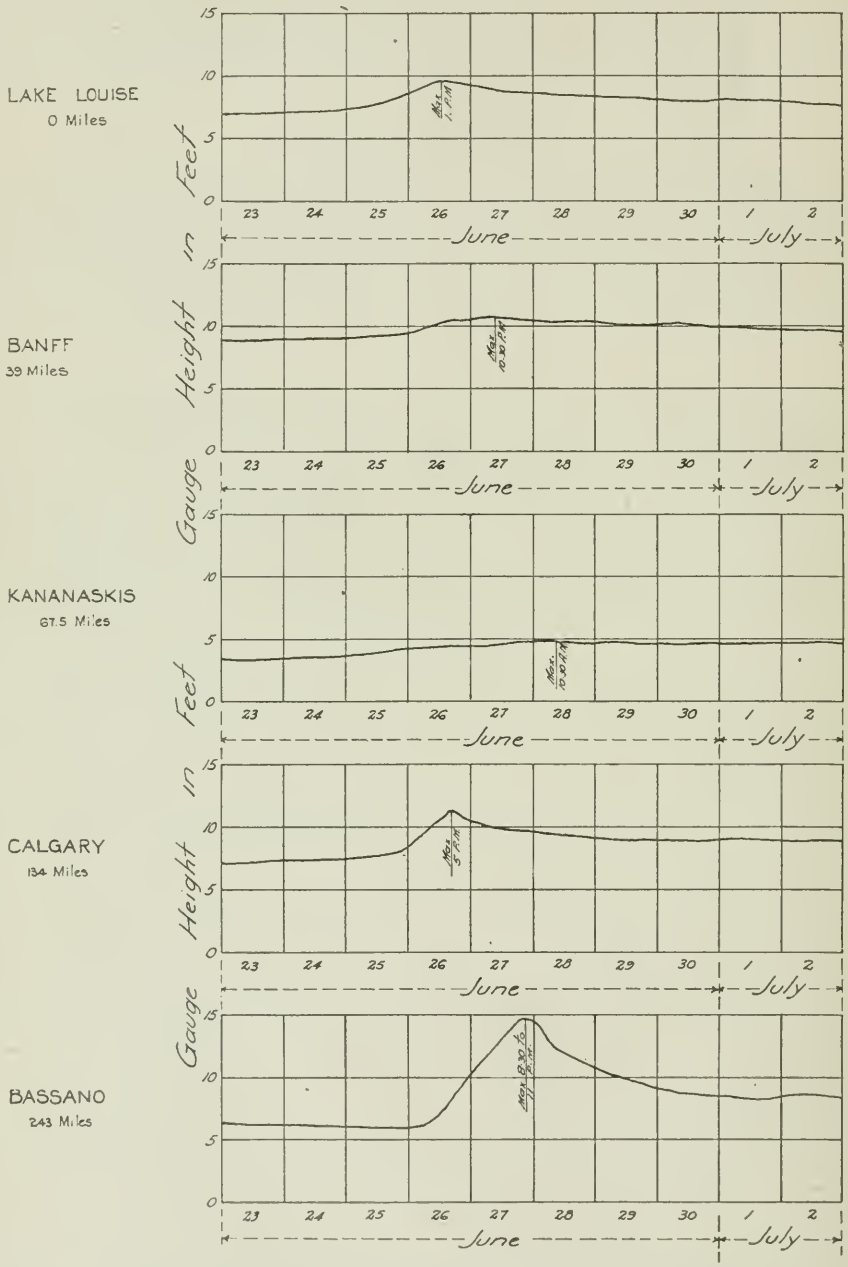
The Southern Alberta Land Company's dam near Carseland on the Bow was partially destroyed causing a loss of $40,000.00.

The total property damage over the Bow basin would be between $150,000.00 and $200,000.00 and the loss of life is placed at four persons. In addition to the above actual losses there were those economic losses caused by the cutting off of gas.

*Prevention of Damage by Floods in Bow Drainage Basin*

The settlement and development of the Bow basin has had two opposite effects on the flow and stage of the streams during floods. The first is that common to all streams along which settlement takes place, namely, the encroachments on the stream channels by the building of structures close to the banks, filling in of parts of the flood channels to obtain more high land and the construction of bridges, piers, abutments, approaches, which reduce the natural flood channel. This encroachment confines the stream to a smaller channel, retards its free run off

DEPARTMENT OF THE INTERIOR. HYDROMETRIC SURVEYS – 1915–PLATE 01.




FLOOD HYDROGRAPHS (GAUGE HEIGHTS) FOR FIVE STATIONS ON BOW RIVER FROM JUNE 23 TO JULY 21, 1915.

and thus has the effect of raising the stage during floods. The second effect is not found on all streams but on the Bow it is to some extent, that is the construction of reservoirs along the main stream and its branches. On the Bow there are at present six dams or weirs. That of the Calgary Power Company at Seebe and Kananaskis would reservoir a certain amount of water. Those of the Eau Claire Lumber Company and the Canadian Pacific Railway at Calgary would retard little water and are really obstructions rather than aids. The Southern Alberta Land Company's dam at Carseland and that of the Canadian Pacific Railway would control the flow to a certain extent. On Cascade River the Calgary Power Company have a dam which would retard most of the flow of this stream for a short period. The cleaning out of the gravel bars in the Bow and Elbow Rivers at Calgary during the past few years must have increased the channel to some extent.

The further construction of reservoirs, on the tributaries of the Bow in connection with power development and the protection of the forest areas will result in a slower run-off and if the encroachments into the channels are controlled there should not be the same dangers to settlements along the lower reaches of the stream from future floods.

MEAN GAUGE HEIGHT AND DISCHARGE for the day of maximum discharge for 10 Stations on Bow River Drainage Basin for years 1908–15.

TABLE D.2

| | | 1908. | 1909. | 1910. | 1911. | 1912. | 1913. | 1914. | 1915. |
|---|---|---|---|---|---|---|---|---|---|
| Bow River—Lake Louise.... | Date | ..... | ..... | ..... | June 24 | Aug. 25 | June 11 | July 15 | June 26 |
| | G.H. | ..... | ..... | ..... | 3.48 | 8.56 | 8.74 | 8 50 | 9.54 |
| | Disch. | ..... | ..... | ..... | 2,063 | 1,886 | 1,936 | 1,940 | 2,985 |
| Bow River—Banff..... | Date. | ..... | July 7, 8 | June 12 | June 14 | June 27 | June 11 | June 18 | June 27 |
| | G.H. | ..... | 5.00 | 4.35 | 4.70 | 3.56 | 4.62 | 4.29 | 10.33 |
| | Disch. | ..... | 11,060 | 8,120 | 9,310 | 5,192 | 8,204 | 7,570 | 8,335 |
| Spray River—Banff..... | Date | ..... | ..... | July 18 | June 18 | June 17 | June 11 | June 19 | June 26 |
| | G.H. | ..... | ..... | 2.00 | 2.75 | 7.55 | 7.80 | 7.48 | 7.55 |
| | Disch. | ..... | ..... | 1,510*b* | 2,640 | 2,530 | 2,960 | 3,041 | 2,300 |
| Cascade River—Bankhead... | Date | ..... | ..... | ..... | ..... | Aug. 18 | June 11 | June 5 | June 28 |
| | G.H. | ..... | ..... | ..... | ..... | 3.47 | 4.54 | 4.28 | 4 66 |
| | Disch. | ..... | ..... | ..... | ..... | 1,695 | 1,240 | 1,400 | 2,607 |
| Bow River—Kananaskis and Morley (*c*). | Date | ..... | ..... | June 18 | June 25 | July 14 | June 13 | June 18 | June 28 |
| | G.H. | ..... | ..... | 5.80*c* | 6.45*c* | 3.84 | 4.65 | 4.37 | 4.90 |
| | Disch. | ..... | ..... | 13,090 | 13,545 | 8,308 | 11,150 | 10,422 | 13,780 |
| Kananaskis River—Kananaskis. | Date | ..... | ..... | ..... | ..... | July 21 | June 10 | June 19 | June 27 |
| | G.H. | ..... | ..... | ..... | ..... | 9.53 | 7.23 | 7 00 | 8 55 |
| | Disch. | ..... | ..... | ..... | ..... | 3,258 | 2,150 | 2,370 | 5,380 |
| Ghost River—Gillies Ranch.. | Date. | ..... | ..... | ..... | ..... | July 8 | June 27 | June 13 July 6 | June 26 |
| | G.H. | ..... | ..... | ..... | ..... | 4 80 | 3 30 | 3 83 | 10 17 |
| | Disch. | ..... | ..... | ..... | ..... | 1,695 | 1,225 | 348 | 8,440 |
| Bow River—Calgary..... | Date | June 6 | July 7 | June 13 | June 25 | July 10 | June 12 | June 18 | June 26 |
| | G.H. | .....*a* | .....*a* | .....*a* | ..... | 8 00 | 7 90 | 8 02 | 10 07 |
| | Disch. | 13,440 | 19,769 | 13,668 | 16,460 | 15,210 | 14,670 | 14,2[illegible]0 | 28 130 |
| Elbow River—Calgary..... | Date | June 5, 6 | June 3 | June 12 | June 1 | June 16 | Aug. 10 | June 18 | June 26 |
| | G.H. | 5 70 | 4 10 | 1 65 | 2 61 | 5 36 | 3 86 | 3 11 | 9 46 |
| | Disch. | 5,615 | 3,320 | 6 50 | 1,466 | 4,312 | 1,367 | 1,020 | 11,728 |
| Bow River—Bassano..... | Date | ..... | ..... | | Aug 9 | | | June 18 | June 27 |
| | G.H. | ..... | ..... | ..... | ..... | | | 6 36 | 14 70 |
| | Disch. | ..... | ..... | | 22,780 | | | 14,340 | 69,156 |

*a* Discharge adjusted to represent discharge above mouth of Elbow river.
*b* Records start July 15, 1910.

HOURLY GAUGE HEIGHT AND DISCHARGE of Bow River at Calgary for June Flood of 1915.

TABLE D.3

| Hour. | June 24. | | June 25. | | June 26. | | June 27. | | June 28. | | June 29. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 7.06 | 9,840 | 7.21 | 10,440 | 7.86 | 13,170 | 10.29 | 30,200 | 9.61 | 24,580 | 9.13 | 20,475 |
| 2 | 7.04 | 9,760 | 7.22 | 10,480 | 7.94 | 13,530 | 10.35 | 30,800 | 9.60 | 24,100 | 9.14 | 20,550 |
| 3 | 7.10 | 10,000 | 7.23 | 10,520 | 8.04 | 14,000 | 10.24 | 29,700 | 9.59 | 24,020 | 9.17 | 20,775 |
| 4 | 7.10 | 10,000 | 7.24 | 10,560 | 8.14 | 14,500 | 10.13 | 28,670 | 9.58 | 23,940 | 9.15 | 20,625 |
| 5 | 7.10 | 10,000 | 7.29 | 10,760 | 8.50 | 16,350 | 10.22 | 29,500 | 9.55 | 23,700 | 9.14 | 20,550 |
| 6 | 7.14 | 10,160 | 7.36 | 11,040 | 9.07 | 20,025 | 10.12 | 28,580 | 9.54 | 23,620 | 9.16 | 20,700 |
| 7 | 7.21 | 10,440 | 7.40 | 11,200 | 9.61 | 24,180 | 10.06 | 28,040 | 9.53 | 23,540 | 9.15 | 20,625 |
| 8 | 7.20 | 10,400 | 7.41 | 11,240 | 9.94 | 26,960 | 10.00 | 27,500 | 9.50 | 23,300 | 9.12 | 20,400 |
| 9 | 7.22 | 10,480 | 7.42 | 11,280 | 10.23 | 29,600 | 9.97 | 27,230 | 9.46 | 22,980 | 9.11 | 20,325 |
| 10 | 7.20 | 10,400 | 7.44 | 11,360 | 10.34 | 30,700 | 9.90 | 26,600 | 9.44 | 22,820 | 9.11 | 20,325 |
| 11 | 7.22 | 10,480 | 7.45 | 11,400 | 10.55 | 32,950 | 9.93 | 26,870 | 9.42 | 22,660 | 9.10 | 20,250 |
| 12 | 7.27 | 10,680 | 7.47 | 11,480 | 10.86 | 36,420 | 9.89 | 26,510 | 9.40 | 22,500 | 9.10 | 20,250 |
| 13 | 7.26 | 10,640 | 7.48 | 11,520 | 10.93 | 37,260 | 9.89 | 26,510 | 9.39 | 22,425 | 9.09 | 20,175 |
| 14 | 7.26 | 10,640 | 7.50 | 11,600 | 11.04 | 38,580 | 9.87 | 26,330 | 9.36 | 22,200 | 9.07 | 20,025 |
| 15 | 7.28 | 10,720 | 7.53 | 11,720 | 11.08 | 39,060 | 9.85 | 26,150 | 9.35 | 22,125 | 9.05 | 19,875 |
| 16 | 7.29 | 10,760 | 7.55 | 11,800 | 11.12 | 39,540 | 9.82 | 25,880 | 9.32 | 21,900 | 9.02 | 19,650 |
| 17 | 7.37 | 11,080 | 7.58 | 11,920 | 11.14 | 39,780 | 9.82 | 25,880 | 9.29 | 21,675 | 9.03 | 19,725 |
| 18 | 7.36 | 11,040 | 7.59 | 11,960 | 11.12 | 39,540 | 9.79 | 25,620 | 9.28 | 21,600 | 8.97 | 19,305 |
| 19 | 7.34 | 10,960 | 7.63 | 12,135 | 11.07 | 38,940 | 9.76 | 25,380 | 9.27 | 21,525 | 8.98 | 19,370 |
| 20 | 7.30 | 10,800 | 7.60 | 12,000 | 10.89 | 36,780 | 9.75 | 25,300 | 9.25 | 21,375 | 8.96 | 19,240 |
| 21 | 7.30 | 10,800 | 7.64 | 12,180 | 10.70 | 34,600 | 9.72 | 25,060 | 9.25 | 21,375 | 8.97 | 19,305 |
| 22 | 7.23 | 10,520 | 7.69 | 12,405 | 10.54 | 32,840 | 9.66 | 24,580 | 9.23 | 21,225 | 9.01 | 19,575 |
| 23 | 7.25 | 10,600 | 7.73 | 12,585 | 10.43 | 31,630 | 9.62 | 24,260 | 9.20 | 21,000 | 8.96 | 19,240 |
| 24 | 7.30 | 10,800 | 7.78 | 12,810 | 10.38 | 31,100 | 9.61 | 24,180 | 9.18 | 20,850 | 8.97 | 19,305 |
| Mean | 10,500 | | 11,516 | | 29,668 | | 26,889 | | 22,543 | | 20,027 | |
| Run-off acre-feet | 20,822 | | 22,836 | | 58,832 | | 53,321 | | 44,703 | | 39,714 | |

DAILY GAUGE HEIGHT AND DISCHARGE of Bow River at all stations, for June 1915.

TABLE D.4

| DAY. | Lake Louise. | | Banff. | | Kananaskis. | | Calgary. | | Carseland. | | Bassano. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 6.36 | 450 | 8.08 | 1,998 | 2.89 | 3,426 | 5.72*a* | 5,460 | ..... | ..... | 5.22 | 10,600 |
| 2 | 6.35 | 447 | 8.17 | 2,152 | 2.86 | 3,324 | 5.86 | 5,880 | ..... | ..... | 5.22 | 10,600 |
| 3 | 6.24 | 410 | 8.10 | 2,030 | 2.88 | 3,392 | 6.08 | 6,540 | ..... | ..... | 5.32 | 11,100 |
| 4 | 6.27 | 420 | 8.10 | 2,030 | 2.85 | 3,290 | 5.98 | 6,240 | ..... | ..... | 5.92 | 14,360 |
| 5 | 6.36 | 450 | 8.17 | 2,152 | 2.88 | 3,392 | 5.94 | 6,120 | ..... | ..... | 5.62 | 12,710 |
| 6 | 6.34 | 444 | 8.16 | 2,135 | 2.89 | 3,426 | 5.92 | 6,060 | ..... | ..... | 5.42 | 11,610 |
| 7 | 6.51 | 506 | 8.14 | 2,100 | 2.90 | 3,460 | 5.97 | 6,210 | ..... | ..... | 5.52 | 12,160 |
| 8 | 6.53 | 515 | 8.10 | 2,030 | 2.92 | 3,530 | 6.30 | 7,250 | ..... | ..... | 5.42 | 11,610 |
| 9 | 6.36 | 450 | 8.09 | 2,014 | 3.07 | 4,055 | 6.18 | 6,840 | ..... | ..... | 5.82 | 13,810 |
| 10 | 6.25 | 413 | 8.05 | 1,950 | 3.04 | 3,950 | 5.96 | 6,180 | ..... | ..... | 5.72 | 13,260 |
| 11 | 6.14 | 376 | 7.94 | 1,777 | 2.94 | 3,600 | 5.91*b* | 6,030 | ..... | ..... | 5.62 | 12,710 |
| 12 | 6.10 | 363 | 7.92 | 1,746 | 2.87 | 3,358 | 6.14 | 6,520 | ..... | ..... | 5.32 | 11,100 |
| 13 | 6.24 | 410 | 7.96 | 1,808 | 2.86 | 3,324 | 6.10 | 6,400 | ..... | ..... | 5.22 | 10,600 |
| 14 | 6.35 | 447 | 8.05 | 1,950 | 2.87 | 3,358 | 6.11 | 6,430 | ..... | ..... | 5.22 | 10,600 |
| 15 | 6.51 | 506 | 8.18 | 2,170 | 3.14 | 4,304 | 6.21 | 6,735 | ..... | ..... | 5.32 | 11,100 |
| 16 | 6.74 | 606 | 8.33 | 2,447 | 3.10 | 4,160 | 6.33 | 7,155 | ..... | ..... | 5.22 | 10,600 |
| 17 | 7.10 | 792 | 8.71 | 3,212 | 3.17 | 4,412 | 6.75 | 8,625 | ..... | ..... | 5.22 | 10,600 |
| 18 | 7.01 | 740 | 8.70 | 3,190 | 3.58 | 5,888 | 7.44 | 11,360 | ..... | ..... | 5.52 | 12,160 |
| 19 | 6.85 | 658 | 8.61 | 3,001 | 3.50 | 5,600 | 7.42 | 11,280 | ..... | ..... | 6.72 | 19,120 |
| 20 | 6.74 | 606 | 8.61 | 3,001 | 3.48 | 5,528 | 7.37 | 11,080 | ..... | ..... | 6.92 | 20,320 |
| 21 | 6.73 | 602 | 8.50 | 2,780 | 3.44 | 5,384 | 7.25 | 10,600 | ..... | ..... | 6.92 | 20,320 |
| 22 | 6.77 | 620 | 8.52 | 2,820 | 3.45 | 5,420 | 7.10 | 10,000 | ..... | ..... | 6.72 | 19,120 |
| 23 | 6.96 | 713 | 8.67 | 3,127 | 3.45 | 5,420 | 7.10 | 10,000 | ..... | ..... | 6.52 | 17,920 |
| 24 | 7.09 | 786 | 8.77 | 3,344 | 3.47 | 5,492 | 7.23 | 10,520 | ..... | ..... | 6.42 | 17,320 |
| 25 | 7.65 | 1,168 | 9.07 | 4,109 | 3.61 | 5,996 | 7.50 | 11,600 | ..... | ..... | 6.22 | 16,120 |
| 26 | 9.54 | 2,985 | 10.14 | 7,670 | 4.24 | 8,492 | 10.07 | 28,130 | ..... | ..... | 6.52 | 17,920 |
| 27 | 8.74 | 2,201 | 10.33 | 8,335 | 4.53 | 10,070 | 9.93 | 26,870 | ..... | ..... | 14.70 | 69,156 |
| 28 | 8.35 | 1,819 | 9.97 | 7,075 | 4.90 | 13,780 | 9.39 | 22,425 | ..... | ..... | 12.26 | 53,833 |
| 29 | 8.06 | 1,538 | 9.81 | 6,515 | 4.84 | 13,024 | 9.06 | 19,950 | ..... | ..... | 9.79 | 38,321 |
| 30 | 7.96 | 1,443 | 9.76 | 6,340 | 4.65 | 11,000 | 8.88*c* | 18,720 | ..... | ..... | 9.02 | 33,486 |

No Gauge Height Records taken in June.

Bow river at Calgary *a* to *b* chain gauge heights, *b* to *c* auto gauge heights.

## Hourly Gauge Height and Discharge of Elbow River at Calgary, for June Flood of 1915.

Table D.5

| Hour. | June 24. | | June 25. | | June 26. | | June 27. | | June 28. | | June 29. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft* | *Feet.* | *Sec.-* |
| 1 | 3.07 | 1,493 | 3.25 | 1,670 | 5.20 | 4,110 | 8.62 | 10,216 | 5.69 | 4,942 | 4.63 | 3,282 |
| 2 | 3.08 | 1,502 | 3.26 | 1,680 | 5.35 | 4,358 | 8.44 | 9,892 | 5.63 | 4,834 | 4.61 | 3,254 |
| 3 | 3.08 | 1,502 | 3.27 | 1,690 | 5.50 | 4,610 | 8.27 | 9,586 | 5.58 | 4,746 | 4.59 | 3,226 |
| 4 | 3.08 | 1,502 | 3.28 | 1,700 | 5.65 | 4,870 | 8.09 | 9,262 | 5.52 | 4,644 | 4.57 | 3,198 |
| 5 | 3.09 | 1,511 | 3.29 | 1,710 | 5.80 | 5,140 | 7.91 | 8,938 | 5.46 | 4,542 | 4.55 | 3,170 |
| 6 | 3.09 | 1,511 | 3.30 | 1,720 | 5.94 | 5,392 | 7.73 | 8,614 | 5.40 | 4,440 | 4.52 | 3,128 |
| 7 | 3.09 | 1,511 | 3.32 | 1,740 | 6.08 | 5,644 | 7.56 | 8,308 | 5.34 | 4,341 | 4.50 | 3,100 |
| 8 | 3.10 | 1,520 | 3.33 | 1,750 | 6.22 | 5,896 | 7.36 | 7,948 | 5.28 | 4,242 | 4.48 | 3,074 |
| 9 | 3.10 | 1,520 | 3.34 | 1,760 | 6.36 | 6,148 | 7.19 | 7,642 | 5.22 | 4,143 | 4.46 | 3,048 |
| 10 | 3.10 | 1,520 | 3.35 | 1,770 | 6.50 | 6,400 | 7.00 | 7,300 | 5.16 | 4,050 | 4.44 | 3,022 |
| 11 | 3.10 | 1,520 | 3.36 | 1,780 | 6.65 | 6,670 | 6.83 | 6,994 | 5.10 | 3,960 | 4.42 | 2,996 |
| 12 | 3.10 | 1,520 | 3.37 | 1,790 | 7.26 | 7,768 | 6.66 | 6,688 | 5.04 | 3,870 | 4.40 | 2,970 |
| 13 | 3.11 | 1,530 | 3.45 | 1,870 | 7.85 | 8,830 | 6.55 | 6,490 | 5.00 | 3,810 | 4.38 | 2,944 |
| 14 | 3.12 | 1,540 | 3.60 | 2,020 | 8.44 | 9,892 | 6.44 | 6,292 | 4.98 | 3,780 | 4.37 | 2,931 |
| 15 | 3.13 | 1,550 | 3.74 | 2,174 | 8.95 | 10,810 | 6.33 | 6,094 | 4.93 | 3,705 | 4.36 | 2,918 |
| 16 | 3.15 | 1,570 | 3.90 | 2,350 | 9.44 | 11,692 | 6.24 | 5,932 | 4.87 | 3,618 | 4.35 | 2,905 |
| 17 | 3.16 | 1,580 | 4.04 | 2,518 | 9.92 | 12,556 | 6.18 | 5,824 | 4.82 | 3,548 | 4.34 | 2,892 |
| 18 | 3.17 | 1,590 | 4.18 | 2,686 | 10.40 | 13,420 | 6.11 | 5,698 | 4.78 | 3,492 | 4.33 | 2,879 |
| 19 | 3.18 | 1,600 | 4.34 | 2,892 | 9.70 | 12,160 | 6.05 | 5,590 | 4.76 | 3,464 | 4.32 | 2,866 |
| 20 | 3.19 | 1,610 | 4.48 | 3,074 | 9.48 | 11,764 | 5.99 | 5,482 | 4.74 | 3,436 | 4.30 | 2,840 |
| 21 | 3.20 | 1,620 | 4.63 | 3,282 | 9.35 | 11,530 | 5.93 | 5,374 | 4.72 | 3,408 | 4.29 | 2,827 |
| 22 | 3.21 | 1,630 | 4.77 | 3,478 | 9.16 | 11,188 | 5.87 | 5,266 | 4.69 | 3,366 | 4.28 | 2,814 |
| 23 | 3.22 | 1,640 | 4.90 | 3,660 | 8.98 | 10,864 | 5.81 | 5,158 | 4.67 | 3,338 | 4.27 | 2,801 |
| 24 | 3.24 | 1,660 | 5.05 | 3,885 | 8.80 | 10,540 | 5.75 | 5,050 | 4.65 | 3,310 | 4.26 | 2,788 |
| Mean | 1,552 | | 2,277 | | 8,427 | | 7,068 | | 3,960 | | 2,995 | |
| Run-off, acre-feet | 3,078 | | 4,516 | | 16,717 | | 14,015 | | 7,854 | | 5,940 | |

## Flood Run-Off for Streams in Bow River Drainage Basin for 1915.

Table D.6

| Stream. | Station. | Period. | Run-Off in Acre-feet. | |
|---|---|---|---|---|
| | | | Tributary. | Main Stream. |
| Bath Creek | Lake Louise | June 26–27 | 1,600 | ..... |
| Bow | do | June 25–28 | ..... | 16,000 |
| Pipestone | do | June 26–28 | 6,900 | ..... |
| Forty Mile | Banff | June 25–July 2 | 6,000 | ..... |
| Bow | do | June 26–July 2 | ..... | 95,000 |
| Spray | do | June 25–July 1 | 29,000 | ..... |
| Cascade | Bankhead | June 26–July 9 | 56,500 | ..... |
| Bow | Kananaskis | June 26–July 3 | ..... | 190,000 |
| Kananaskis | do | June 26–July 1 | 47,500 | ..... |
| Ghost | Gillies Ranch | June 26–29 | 35,280 | ..... |
| Jumpingpound | Jumpingpound | June 25–30 | 29,500 | ..... |
| Bow | Calgary | June 26–July 3 | ..... | 340,000 |
| Elbow | do | June 26–28 | 44,000 | ..... |
| Fish | Priddis | June 26–29 | 22,500 | ..... |
| Sheep | Okotoks | June 26–29 | 85,000 | ..... |
| Highwood | Aldersyde | June 26–28 | 56,000 | ..... |
| Bow | Bassano | June 27–July 4 | ..... | 615,000 |

## RED DEER RIVER DRAINAGE BASIN.

### *General Description.*

The Red Deer River is the most northerly branch and is the largest tributary of the South Saskatchewan River. The river drains those portions of the eastern slope of the Rocky Mountains and the adjacent foothills and prairies between and east of the Bow River basin on the south and the North Saskatchewan River on the north.

A noticeable fact in connection with the drainage basin of the stream is that while its foothill region is fairly extensive, the mountainous portion does not cover a large area. This is due to the fact that the Bow and North Saskatchewan Rivers have a common divide west of the Red Deer and thus cut off the drainage from the main range of the Rocky Mountains.

Above the town of Red Deer, 14 per cent of the catchment area is above 6000 feet and 28 per cent is between 4000 and 6000 feet leaving 58 per cent under 4000 feet, of which perhaps half is forest covered and unlike the Bow drainage is not almost entirely prairie land.

The main river rises in the Sawback Range of the Rocky Mountains and flows easterly then northeasterly until near the town of Red Deer. It here turns southeasterly and enters the South Saskatchewan River just east of the boundary between the provinces of Alberta and Saskatchewan. The Panther and Little Red Deer Rivers are the most important tributaries in the foothills section and the Rosebud River in the prairie section.

This stream being partially mountain fed is, of course, subject to high water due to melting snows but floods on it seem to be almost entirely due to heavy rains.

### *Former Floods.*

Few records of former floods on this stream are available and as regular gaugings have only been taken since 1911 no reliable data are available. Floods are known to have occurred in 1897, 1899, 1902 and 1908, but nothing is known of their magnitude. Old residents claim that the flood of 1915 was the greatest which ever occurred.

### *Causes of Flood of June-July, 1915.*

The causes of the flood of 1915 were similar to those of the neighbouring streams, namely the heavy rains of June 24–27 on the already heavily saturated drainage basin. As the conditions on this basin are similar in most respects to the Bow and North Saskatchewan Rivers it is not considered necessary to further dwell on this part of the report.

### *Precipitation and Temperature.*

There are only a few meteorological stations in the westerly portions of this drainage basin. It is, however, assumed that for the whole area, temperature for June was below the average and that the precipitation was above the average, varying from 5 to 9 inches with a probable mean of 7 inches over the entire area. (See Introduction *re* Precipitation and Temperature.)

At Red Deer the mean temperature for June was 51.6 degrees or 2.3° below the average, the total precipitation 4.81 inches or 0.18 above average with a fall of 2.11 inches on a single day.

At Lacombe the mean temperature was 52.6 degrees with a total precipitation of 8.28 inches. The heaviest fall for a single day was 2.20 inches.

### *Progress of the Flood.*

The progress of the crest of the flood on the Red Deer River cannot be well judged as we had only the one station on the stream in June, 1915. The river at Red Deer began to rise early in the day on June 26 and reached its maximum stage of 19.05 feet with a discharge of 68,000 sec.-ft. about 9 p.m. on June 27. The crest of the discharge reached Drumheller about 10 p.m. on June 28, taking 25 hours to travel 125 miles, or at a rate of 5 miles per hour. The crest reached Empress some time late in the day on June 30, a distance from Drumheller of some 195 miles.

### *Stage and Discharge.*

Table E 1 shows hourly gauge height and discharges for the six days during the flood at Red Deer.

The discharge in acre-feet during the flood at Red Deer was about 276,342 acre-feet, or 61 acre-feet per mile of drainage area.

While the Red Deer River was very high during this flood there was not a great deal of damage done to property. The water at Red Deer flooded the electric light plant of the town and washed out a section of street. At Drumheller the river was up to the lower chords of the Canadian Northern bridge.

HOURLY GAUGE HEIGHT AND DISCHARGE of Red Deer River at Red Deer, for Flood, June-July, 1915.

TABLE E.1

| Hour. | June 26 | | June 27 | | June 28. | | June 29. | | June 30. | | July 1. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. | Gauge Height. | Dis-charge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 7.9 | 9,300 | 12.40 | 26,500 | 18.9 | 67,200 | 14.9 | 40,300 | 12.2 | 25,500 | 11.1 | 20,250 |
| 2 | 7.9 | 9,300 | 12.70 | 28,000 | 18.8 | 66,500 | 14.7 | 37,100 | 12.1 | 25,000 | 11.1 | 20,250 |
| 3 | 8.0 | 9,600 | 13.10 | 30,000 | 18.7 | 65,800 | 14.6 | 38,500 | 12.0 | 24,500 | 11.0 | 19,800 |
| 4 | 8.0 | 9,600 | 13.50 | 32,150 | 18.6 | 65,100 | 14.5 | 37,900 | 11.9 | 24,000 | 11.0 | 19,800 |
| 5 | 8.1 | 9,900 | 13.90 | 34,375 | 18.4 | 63,700 | 14.3 | 36,700 | 11.9 | 24,000 | 10.9 | 19,350 |
| 6 | 8.2 | 10,200 | 14.30 | 36,700 | 18.3 | 63,000 | 14.2 | 36,100 | 11.8 | 23,500 | 10.9 | 19,350 |
| 7 | 8.3 | 10,500 | 14.70 | 37,100 | 18.1 | 61,600 | 14.0 | 34,950 | 11.7 | 23,025 | 10.8 | 18,900 |
| 8 | 8.3 | 10,500 | 15.10 | 41,540 | 18.0 | 60,900 | 13.9 | 34,375 | 11.7 | 23,025 | 10.8 | 18,900 |
| 9 | 8.4 | 10,800 | 15.50 | 44,100 | 17.8 | 59,500 | 13.8 | 33,800 | 11.6 | 22,550 | 10.7 | 18,450 |
| 10 | 8.5 | 11,100 | 16.00 | 47,300 | 17.5 | 57,400 | 13.6 | 32,700 | 11.6 | 22,550 | 10.7 | 18,450 |
| 11 | 8.6 | 11,400 | 16.40 | 49,940 | 17.3 | 56,000 | 13.4 | 31,600 | 11.5 | 22,075 | 10.6 | 18,000 |
| 12 | 8.7 | 11,700 | 16.80 | 52,580 | 17.1 | 54,600 | 13.3 | 31,050 | 11.5 | 22,075 | 10.6 | 18,000 |
| 13 | 8.8 | 12,000 | 17.20 | 55,300 | 16.9 | 53,240 | 13.2 | 30,500 | 11.4 | 21,600 | 10.6 | 18,000 |
| 14 | 9.0 | 12,600 | 17.60 | 58,100 | 16.7 | 51,920 | 13.0 | 29,500 | 11.4 | 21,600 | 10.5 | 17,575 |
| 15 | 9.1 | 12,900 | 18.00 | 60,900 | 16.5 | 50,600 | 12.9 | 29,000 | 11.4 | 21,600 | 10.5 | 17,575 |
| 16 | 9.3 | 13,600 | 18.50 | 64,400 | 16.3 | 49,280 | 12.8 | 28,500 | 11.3 | 21,150 | 10.5 | 17,575 |
| 17 | 9.5 | 14,300 | 18.70 | 65,800 | 16.1 | 47,960 | 12.7 | 28,000 | 11.3 | 21,150 | 10.6 | 18,000 |
| 18 | 9.8 | 15,350 | 18.80 | 66,500 | 15.9 | 46,660 | 12.7 | 28,000 | 11.3 | 21,150 | 10.6 | 18,000 |
| 19 | 10.1 | 16,450 | 18.90 | 67,200 | 15.7 | 45,380 | 12.6 | 27,500 | 11.2 | 20,700 | 10.7 | 18,450 |
| 20 | 10.4 | 17,650 | 18.95 | 67,550 | 15.6 | 44,740 | 12.5 | 27,000 | 11.2 | 20,700 | 10.7 | 18,450 |
| 21 | 10.8 | 19,250 | 19.00 | 67,900 | 15.5 | 44,100 | 12.4 | 26,500 | 11.2 | 20,700 | 10.8 | 18,900 |
| 22 | 11.1 | 20,475 | 19.05 | 68,250 | 15.3 | 42,820 | 12.3 | 26,000 | 11.2 | 20,700 | 10.8 | 18,900 |
| 23 | 11.6 | 22,700 | 19.00 | 67,900 | 15.2 | 42,180 | 12.3 | 26,000 | 11.1 | 20,250 | 10.8 | 18,900 |
| 24 | 12.0 | 24,500 | 19.00 | 67,900 | 15.0 | 40,900 | 12.2 | 25,500 | 11.1 | 20,250 | 10.8 | 18,900 |
| Mean | 13,569 | | 51,582 | | 54,212 | | 31,544 | | 22,223 | | 18,697 | |
| Run-off, acre-feet | 26,907 | | 102,287 | | 107,502 | | 62,551 | | 44,068 | | 37,076 | |

## NORTH SASKATCHEWAN RIVER DRAINAGE BASIN.

### *General Description.*

The North Saskatchewan River draws its water supply from the eastern slope of the Rocky Mountains. The basin is bounded on the south by that of the Red Deer River and on the north by that of the Athabaska River. Its principal tributaries in the mountain district are the Clearwater and Brazeau Rivers. In addition to these there are a great number of smaller streams draining into the river. From the city of Edmonton the river takes a north and easterly course for about forty or fifty miles and then flows in an easterly direction to its junction with the South Saskatchewan River a few miles east of the city of Prince Albert, Saskatchewan. From this point it is known as the Saskatchewan River. The greater part of the drainage basin in the prairie section lies to the south of the river and the principal tributaries are the Vermilion and Battle Rivers, the former emptying into the main stream north and a little west of the town of Lloydminster and the latter at the town of Battleford.

In the mountain section the North Saskatchewan River and its tributaries have well defined rocky valleys with a large amount of fall and the whole drainage basin is well wooded. The valley of the stream widens out as it reaches the prairies into large fertile flats. The timber in this part of the drainage basin is confined mostly to the river valley. The stream bed changes from a rocky and fairly solid formation in the mountain district to a gravel, sandy and very unstable bed as the river comes out on to the prairies.

The stream receives the greater part of its water supply from the mountains. In consequence, the high water occurs in the hot months of summer, caused by the melting snow from the mountains. The low-water period occurs in the winter months when there is a minimum amount of drainage from the whole basin.

To obtain a clear idea of conditions in this drainage basin it is necessary to give a description of the principal characteristics of the different parts of the area. The basin naturally divides itself into five parts.

The first or upper part consists of the eastern slope of the Rocky Mountains. While this part of the basin is not the largest in area, the greater part of the run-off is derived from it. In glaciers and perpetual snows of the higher peaks innumerable small streams rise and flow

eastward, forming large streams which empty into the main river. These streams are also fed by the melting of heavy snows and by rains which fall in the mountains at all seasons of the year. The region, being mountainous, has a tendency under these conditions to discharge a great quantity of water into the streams in a short time. This is seen each spring, as the mountains, being for the most part bare of vegetation, are exposed to the sun which melts the winter's snow in a short time. If this warm weather is accompanied by rain, floods take place. The lower parts of the mountains and the valleys have a good forest cover and they alone dampen the effects of warm weather. The streams in this part have a slope of from 20 to 500 feet per mile.

Below the mountain division are the foothills or second part of the basin. This is the largest in area of the five parts. Here the river heads northeasterly and is joined by a great many rivers of various sizes. The valley of the river becomes better defined and deeper. The country is hilly and rough but is not as broken as the first part. The whole region has a fairly heavy precipitation and is well covered with forest. Large tracts of muskeg are found in this region and while to a certain extent they have a tendency to make the run-off uniform if they become well saturated, they offer less resistance than bare hillsides to rapid run-off of heavy rains. The slope of the river in this section is probably from five to twenty feet per mile.

From near Edmonton to the mouth of the Vermilion River, the North Saskatchewan River flows through a park-like country with large stretches of prairie. Few tributaries flow into the few flats along the river. The slope of this section averages 1½ feet per mile.

The fourth section, from the Vermilion River to Prince Albert, is principally prairie with a few stretches of small timber and second growth. The valley of the river is much wider and the river itself widens out into shallow reaches full of shifting sand bars. Low-lying flats border the river for the greater part of the course. The slope of this section is half a foot per mile.

The fifth and last division is from Prince Albert to below the Grand Forks, or junction with the South Saskatchewan. This section has a slope of 1½ feet per mile, made up of a series of rapids. The valley is not as deep as in the two previous sections, and the river channel is better defined. The basin is covered with a fair tree growth with very little prairie land.

Below the fifth section, but on the main Saskatchewan River, is a section which consists of a chain of lakes and lagoons surrounded by low-lying lands and muskegs, covered with trees.

### *Former Floods.*

From the conditions prevailing on the headwaters in the two upper sections it is seen that the North Saskatchewan River is liable to floods of a greater or less magnitude, and during practically each June or July the stage reaches a point which can be considered a flood period or borders closely on such condition.

Previous to 1915 the worst flood in the past fifty years, and in fact as far as records or memory goes, took place in August, 1899.

At that time the river reached a height equal to 41.37 feet on our gauges at Edmonton, or an elevation of 2034.75 feet, Public Works of Canada datum. This height gave a discharge of approximately 180,000 sec.-ft. from an estimate by Kutter's formula. At Prince Albert the gauge height reached was equal to 25.9 feet on the gauge or an elevation of 1481.997 feet, Public Works of Canada datum. This height gives a discharge of 160,000 sec.-ft. by Kutter's formula.

Stories at Prince Albert and Edmonton give records of higher floods, but both seem to have been caused by ice jams in the spring. The jam at Prince Albert is alleged to have taken place some 35 or 40 years ago, while that at Edmonton took place over 80 years ago.

In 1900 the river reached a gauge height equal to 37.9 feet on the gauge at Edmonton and did considerable damage. Since August, 1907, we have fairly continuous records, and the highest gauge height reached was 26 feet on July 10, 1912, the discharge on this date being about 75,000 sec.-ft.

During the floods of 1899 and 1900 considerable damage was done all along the river, but no actual figures are available. In 1899 the low-level bridge at Edmonton was in process of construction at the time of the flood and it was found necessary to raise the piers eight feet higher than at first proposed so as to provide for floods of such magnitude. The water reached to within one and one-half feet of the tops of the present piers at that time.

The cause of the flood of 1899 is rather hard to decide, but in the writer's opinion it can be accounted for by the excessive rains rather than by the melting snows. The meteorological records at Edmonton for August, 1899, gave 6.13 inches of rainfall or 4.63 inches above the monthly mean. The mean temperature was 55.7° or 3.3° below the monthly mean. It is very probable that these conditions prevailed to a greater degree in the two upper sections. It is usual to find that the snow has practically all melted by August and as rises had taken place in June and July of 1899 it is probable that this condition prevailed in that year. Therefore the assumption that this flood was caused by rains is borne out. During the whole summer the entire basin had a very heavy rainfall and in the two upper sections this rainfall would be stored to a certain point when it would run-off very rapidly and add much of the stored water to the exceptionally heavy rains of August.

*Causes of Flood of June-July, 1915.*

The direct cause of this flood was no doubt the heavy rainfall between June 24 and 27 on the already thoroughly saturated drainage area. This rainfall was especially heavy on the upper sections of the basin and in the three days there were fifty-eight hours of continuous rain and the fall is estimated at approximately six inches by Mr. O. H. Hoover, of this staff, who was on the headwaters of the main stream at that time. This precipitation on a country which at best does not retain much of the rainfall and which had already been thoroughly satured by the heavy rains throughout the earlier part of the month caused sudden and excessive run-offs in a short period. The run-off from rain was added to by the rapid melting of the snows at this time.

Owing to the cloudy cold weather early in June the snows of the upper peaks did not melt as readily as ordinarily, and there was more than the usual amount of snow lying on the upper peaks on June 24. Fortunately the snowfall during the winter of 1914–15 was rather below the average.

An idea of the run-off of the upper section at this time can be gained by a study of the maximum discharge of some of the smaller streams in this locality. A very good example is the Mistaya River, a stream with a catchment area of some 130 square miles and on which there are six lakes which regulate the flow to a great extent. This stream reached a maximum discharge of 2,200 sec.-ft., on June 27, or 17 sec.-ft. per square mile of drainage area. This flow for a day would be equal to a run-off of 0.63 inches over the entire drainage area. At Wilson's ranch on the North Saskatchewan River in Tp. 36, Rge. 18, W. 5th Mer., the maximum daily flow was 21,000 sec.-ft. with a catchment area of 836 square miles. This works out as a run-off of 25 sec.-ft. per square mile or 0.93 inches over the drainage area for one day. While these run-offs are by no means records they are high for the eastern slope of the Rocky Mountains in Alberta.

*Precipitation and Temperature.*

Owing to the lack of settlement on the headwaters of the North Saskatchewan River, meteorological stations are not maintained and, therefore, no official records are available.

During June Mr. Hoover reported that there were eighteen days of rain and that during the whole of the early part of the month the temperature was low and the weather cloudy.

At Mountain Park (on the headwaters of the Macleod River at an elevation of 3,891 feet above sea level) the records for June show the mean temperature at 45.2 and the total precipitation as 12.26 inches with a maximum of 3.35 inches on a single day. There were twenty-one days on which 0.01 inch or more fell and nine fair days. At Banff (on the Bow River at an elevation of 4,534 feet above sea level) the records for June show the mean temperature as 50.2 or 1.1 degrees below the mean of twenty years, and the total precipitation as 6.05 inches or 2.86 inches above the average with a maximum fall of 1.97 inches on a single day. There were twenty days with 0.01 inch of rain or more, and ten fair days. As the mountains on the headwaters of the North Saskatchewan drainage lie midway between these two stations it may be assumed that a mean of their records could be assumed as an average for this part of the basin. The mean temperature thus obtained is 47.7° and the total precipitation 9.16 inches. Using in addition the records obtained at Red Deer (which is to the southeast of the headwaters of the North Saskatchewan) and those at Edmonton (on the northeast of the headwaters of the North Saskatchewan) we find that the mean temperature was 50.3 degrees and the mean total precipitation was 7.14 inches. As the catchment area of the headwaters of the North Saskatchewan River lies within the trapezoid bounded at the corners by Banff, Mountain Park, Edmonton and Red Deer, the records for these points should give a very fair average for the whole area. (See Precipitation and Temperature introduction.)

*Progress of the Flood.*

The progress of the crest of the flood down the stream is clearly shown by the graphs on Plates F 1 and F 2.

The most westerly streams rising in and draining the main range of the Rocky Mountains started to rise during the night of June 24–25 and reached their maximum about noon June 27. Those streams draining large areas east of the main range started to rise during the day on June 25 and reached their maximum about 10 a.m., June 27, or about the same time. This allowed the drainage of the lower altitudes to pass off before that of the higher reached the main stream.

The crest on the main stream reached Rocky Mountain House about 2 a.m., June 27, with a stage of 23.38 feet and an estimated discharge of 145,000 sec.-ft. At Rocky Rapids the crest arrived about 10 p.m., June 27, and Edmonton about 11 p.m., June 28, with a stage of 45.04 feet or 3.75 feet above any previous known stage and with an estimated flow of 204,500 sec.-ft. Battleford was reached about 5 p.m., June 30, Ceepee about 6 p.m., July 1, and Prince Albert at 1 p.m., July 2, with a stage of 26.42 feet, or 0.5 foot above the previous highest record, that of 1899, and a maximum discharge of 200,000 sec.-ft.

The rate of progress of the flood seems to have varied very greatly. From Wilson's ranch in Tp. 36, Rge. 18, W. 5th Mer., to Saunders' siding in Tp. 40, Rge. 13, W. 5th Mer., a distance of fifty miles and an approximate fall in elevation of 13.4 feet a mile, it took some six hours, or at a rate of 8.33 miles per hour; from Saunders' siding to Rocky Mountain House, a distance of forty-five miles, with a fall of 12.5 feet per mile, it arrived some twenty-one hours earlier. This was no doubt due to the flood on Sheep and Clearwater Rivers arriving before that on the main stream. From Rocky Mountain House to Rocky Rapids, a distance of 80 miles with a mean fall of approximately 5.5 feet per mile, the crest took twenty hours, or at a rate of flow of four miles per hour; from Rocky Rapids to Edmonton, a distance of 102 miles, and a fall of 6.6 feet per mile, it took twenty-five hours, or a rate of flow of 4.1 miles per hour; Edmonton to Battleford, 320 miles, with a fall of 1.6 feet per mile, forty-two hours, or a rate of flow of 7.6 miles per hour; from Battleford to Ceepee, sixty miles, with a fall of 0.9 foot per mile, twenty-five hours, or a rate of flow of 2.4 miles per hour; from Ceepee to Prince Albert, 98 miles, with a fall of 0.9 foot per mile, nineteen hours, or a rate of 5.2 miles per hour; from Battleford to Prince Albert, a distance of 158 miles, forty-four hours or at a rate of 3.6 miles per hour; from Edmonton to Princè Albert it took eighty-six hours to travel the 478 miles, or at a rate of 5.56 miles per hour.

### *Stage and Discharge.*

Plate F 1 shows the maximum gauge height at all stations affected by flood conditions in the drainage basin; also a graphic representation of the rate of rise and fall at most stations. Tables F 3 and F 4 show the main daily gauge heights and discharges at various stations for June and July, 1915, and tables F 5, F 6, F 7 and F 8, show hourly gauge heights and discharges at Edmonton, Battleford and Prince Albert for six days during the flood.

The maximum gauge height and discharge at the several stations has been given in the body of this report or may be obtained from the plates or tables.

The total discharge in acre-feet during the flood period at Rocky Mountain House was 885,874 acre-feet; at Edmonton 1,190,475 acre-feet and at Prince Albert 987,102 acre-feet.

### *Damages.*

The total damages caused by the flood are hard to accurately arrive at owing to the impossibility of making an accurate and exhaustive survey of such damages.

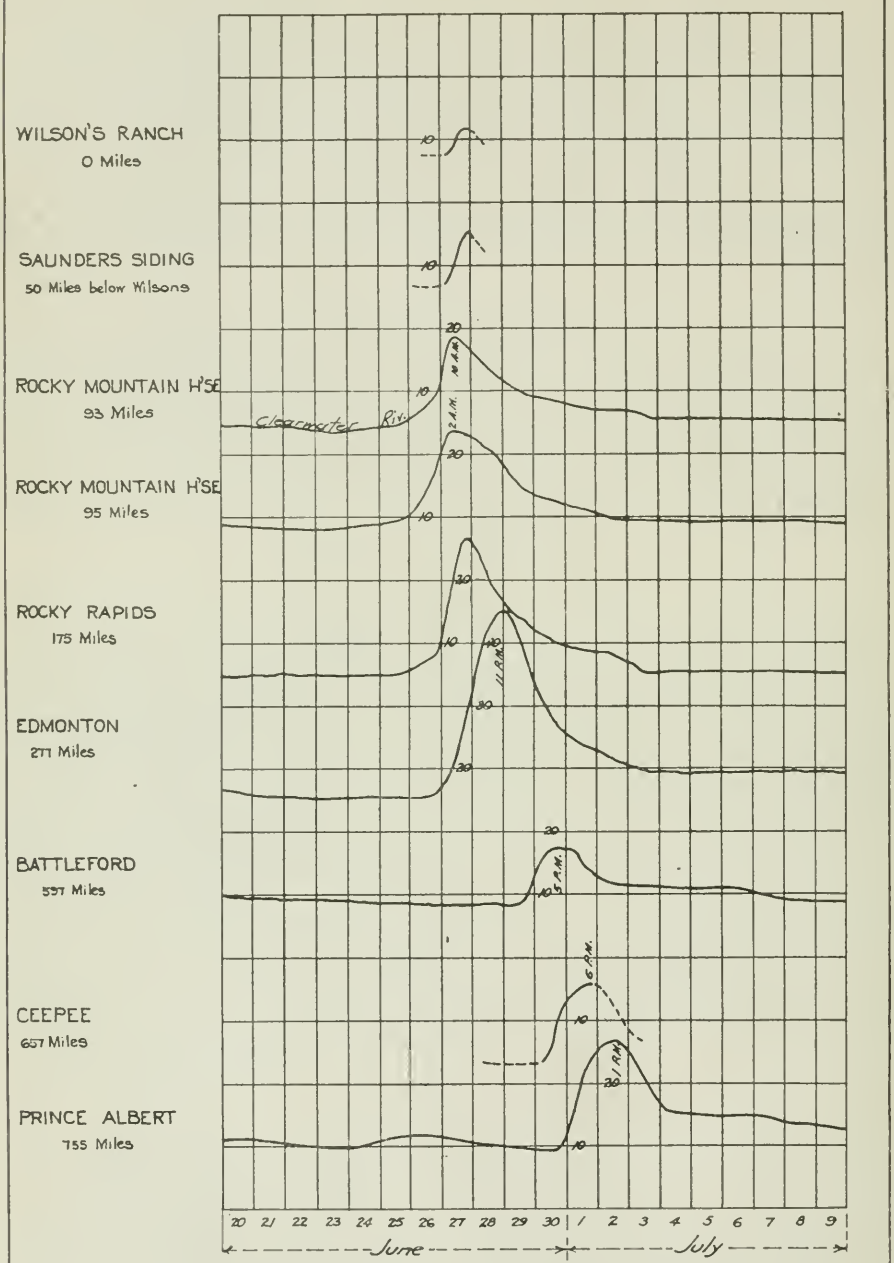
Above the mouth of the Clearwater River the only damages were to trails and to the grade of the Canadian Northern railway (Brazeau branch). These losses would total to at least $30,000, principally to the railway whose grade was destroyed in a number of places. On the Clearwater River a new traffic bridge, about two miles from the mouth, was completely destroyed with a loss of $2,500. At Rocky Mountain House the ferry was destroyed as well as the cable station of this branch. The cost of replacing the ferry was some $1,000 and the cable station some $150. The cable station at Rocky Rapids, owned by Sir John Jackson Company (Canada), was taken out, and it is estimated that it will cost at least $1,000 to replace it. The greatest amount of damage done was at Edmonton where the direct losses are estimated at from $500,000 to $750,000; the loss to the municipality being $17,500 caused by damages to sidewalks, roads and other property; the balance of losses being due to the inundating of the lower parts of the town known as Fraser, Ross and Mill Creek and Gallagher flats, the washing away of the Edmonton Lumber Company's mill and the destruction of booms belonging to the Edmonton Lumber Company and the Walters' mills. Many homes were destroyed and the damage to hundreds of others and their contents was very great. It is estimated that eight hundred families were rendered homeless by the flood. The loss of life was fortunately very light, the only casualty being an infant which was dropped by its mother from a floating side walk into the flooded street. The river began to flood over its banks at gauge height, 35.0 feet, at Edmonton and thus there was a depth of 10 feet of water at some points on the flats. The city electric light and pumping plants at Edmonton were out of commission for some hours owing to flooding of their boiler fires and this caused considerable inconvenience to numbers of businesses and residents in the higher parts of the city.

The damage to property along the river below Edmonton was not very great, a few farms along the flats were inundated and at Battleford several houses were flooded. At Prince Albert the principal damage was due to losses of logs which was well under $10,000

At Edmonton the low level bridge was in danger owing to debris such as buildings, sidewalks, logs and roots collecting on the piers and bridge stringers, but this structure was saved by clearing this debris away and by placing a loaded train on the bridge. The same procedure was carried out at Prince Albert where much debris collected on the piers. At Ceepee, the Canadian Northern Railway bridge approaches were damaged to some slight extent

It is probable that the total actual damage on the whole stream amounted to between $750,000 and $1,000,000. In addition to the damage to property the stream channel at many points was completely changed. Banks and low flats were washed away and deposited at different points along the river and there is probably little of the river bed which was not changed to some extent. In general the river channel has been enlarged which will provide more room for such floods if they occur in the near future.

DEPARTMENT OF THE INTERIOR. · HYDROMETRIC SURVEYS-1915-PLATE F1.




FLOOD HYDROGRAPHS (GAUGE HEIGHTS) FOR NINE STATIONS IN NORTH SASKATCHEWAN RIVER DRAINAGE BASIN, DURING JUNE AND JULY, 1915.

MEAN GAUGE HEIGHT AND DISCHARGE for the day of maximum discharge for 9 Stations on North Saskatchewan Drainage Basin for the years 1911 to 1915.

TABLE F.2

| | | 1911. | 1912. | 1913. | 1914. | 1915. |
|---|---|---|---|---|---|---|
| Wilson's Ranch | Date | ..... | ..... | ..... | ..... | June 27 |
| | G.H. | ..... | ..... | ..... | ..... | 10.61 |
| | Disch | ..... | ..... | ..... | ..... | 21,176*a* |
| Saunders Siding | Date | ..... | ..... | ..... | ..... | June 27, 28 |
| | G.H. | ..... | ..... | ..... | ..... | 15.62 |
| | Disch. | ..... | ..... | ..... | ..... | 43,841*a* |
| Clearwater River—Rocky Mountain House. | Date | ..... | ..... | ..... | June 8 | June 27 |
| | G.H. | ..... | ..... | ..... | 3.80 | 17.58 |
| | Disch. | ..... | ..... | ..... | 2,280 | 39,100 |
| Rocky Mountain House | Date | ..... | ..... | Aug. 13 | June 7 | June 27 |
| | G.H. | ..... | ..... | 10.80 | 9.55 | 22.10 |
| | Disch. | ..... | ..... | 22,750 | 18,000 | 129,700 |
| Rocky Rapids | Date | ..... | ..... | ..... | ..... | June 27 |
| | G.H. | ..... | ..... | ..... | ..... | 26.86*a* |
| | Disch. | ..... | ..... | ..... | ..... | ..... |
| Edmonton | Date | July 3 | July 10 | Aug. 15 | June 9 | June 28 |
| | G.H. | 21.23 | 26.00 | 17.60 | 24.00 | 42.40 |
| | Disch. | 51,442 | 74,100 | 32,600 | 61,740 | 185,560 |
| Battleford | Date | ..... | July 12 | Aug. 19 | June 11 | June 30 |
| | G.H. | ..... | ..... | N. 7.96<br>S. 8.84 | N. 11.99<br>S. 12.60 | N. 15.08<br>S. 15.21 |
| | Disch. | ..... | 65,716 | 29,550*b* | 64,234 | ..... *c* |
| Cecpee | Date | ..... | ..... | ..... | ..... | July 1 |
| | G.H. | ..... | ..... | ..... | ..... | 15.67*d* |
| | Disch. | ..... | ..... | ..... | ..... | ..... |
| Prince Albert | Date | July 10 | July 14 | Aug. 21 | June 14 | July 2 |
| | G.H. | 12.00 | 15.46 | 11.03 | 14.55 | 25.98 |
| | Disch. | 42,200 | 69,880 | 35,665 | 63,290 | 186,540 |

*a* Maximum gauge height and discharge are shewn, as means for the day of maximum discharge are not known
*b* Discharge of 48,200 shewn on June 17, and 31, 797 on July 3, 1913.
*c* Insufficient data to support any estimate.
*d* Gauge maintained by Canadian Northern Railway.

DAILY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River at all Stations, for June 1915.

TABLE F.3

| Day. | Rocky Mt. House. | | Rocky Rapids. | | Edmonton. | | Battleford. North Channel. | | Battleford. South Channel. | | Prince Albert. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 6.60 | 7,180 | ..... | 19,100 | 14.5 | 20,240 | 5.68 | 8,080 | 6.95 | 7,560 | 6.22 | 9,940 |
| 2 | 7.48 | 10,108 | ..... | 23,000 | 13.7 | 17,420 | 5.70 | 8,160 | 6.98 | 7,650 | 6.46 | 10,810 |
| 3 | 8.22 | 13,026 | ..... | 40,000 | 14.6 | 20,600 | 5.76 | 8,390 | 7.04 | 7,830 | 6.64 | 11,510 |
| 4 | 7.65 | 10,730 | ..... | 37,000 | 18.6 | 37,580 | 5.83 | 8,650 | 7.10 | 8,020 | 6.98 | 12,870 |
| 5 | 7.52 | 10,252 | ..... | 29,000 | 17.8 | 33,900 | 5.90 | 8,920 | 7.15 | 8,180 | 7.15 | 13,580 |
| 6 | 7.42 | 9,892 | ..... | 24,200 | 16.0 | 26,120 | 6.01 | 9,340 | 7.25 | 8,500 | 7.02 | 13,030 |
| 7 | 7.30 | 9,470 | ..... | 21,500 | 15.0 | 22,080 | 6.10 | 9,740 | 7.36 | 8,850 | 7.16 | 13,620 |
| 8 | 7.55 | 10,360 | ..... | 22,500 | 14.3 | 19,520 | 6.20 | 10,180 | 7.47 | 9,200 | 8.26 | 18,470 |
| 9 | 7.52 | 10,252 | ..... | 44,000 | 14.6 | 20,600 | 6.32 | 10,710 | 7.60 | 9,660 | 9.65 | 25,110 |
| 10 | 7.52 | 10,252 | ..... | 40,000 | 19.2 | 40,420 | 6.45 | 11,280 | 7.75 | 10,200 | 11.10 | 33,860 |
| 11 | 7.68 | 10,844 | ..... | 36,100 | 18.6 | 37,580 | 6.68 | 12,400 | 7.95 | 10,920 | 10.86 | 32,300 |
| 12 | 7.62 | 10,616 | ..... | 32,700 | 17.6 | 32,980 | 7.25 | 15,350 | 9.22 | 16,670 | 9.97 | 36,840 |
| 13 | 7.68 | 10,844 | ..... | 29,500 | 17.0 | 30,320 | 9.55 | 30,490 | 10.20 | 22,250 | 9.52 | 23,410 |
| 14 | 7.88 | 11,620 | ..... | 26,800 | 16.3 | 27,380 | 9.30 | 28,620 | 10.02 | 21,080 | 9.16 | 22,630 |
| 15 | 7.82 | 11,380 | ..... | 25,400 | 15.7 | 24,880 | 9.35 | 28,990 | 10.10 | 21,600 | 10.23 | 28,380 |
| 16 | 8.00 | 12,100 | ..... | 23,100 | 15.3 | 23,280 | 9.34 | 28,920 | 10.10 | 21,600 | 12.38 | 42,660 |
| 17 | 8.42 | 13,886 | ..... | 30,000 | 15.2 | 22,880 | 9.18 | 27,730 | 9.96 | 20,720 | 11.74 | 38,180 |
| 18 | 8.68 | 15,012 | ..... | 34,500 | 16.2 | 26,960 | 9.10 | 27,140 | 9.95 | 20,660 | 11.14 | 34,120 |
| 19 | 8.35 | 13,585 | ..... | 31,000 | 17.1 | 30,760 | 8.95 | 26,050 | 9.81 | 19,870 | 10.63 | 30,830 |
| 20 | 8.22 | 13,026 | ..... | 28,700 | 16.5 | 28,220 | 8.72 | 24,440 | 9.60 | 18,670 | 10.38 | 29,280 |
| 21 | 8.12 | 12,604 | ..... | 25,700 | 15.9 | 25,700 | 8.50 | 22,900 | 9.38 | 17,490 | 10.14 | 27,840 |
| 22 | 7.92 | 11,780 | ..... | 25,000 | 15.4 | 23,680 | 8.28 | 21,490 | 9.15 | 16,310 | 9.98 | 26,890 |
| 23 | 7.98 | 12,020 | ..... | 24,200 | 15.5 | 22,480 | 7.97 | 19,520 | 8.85 | 14,860 | 9.79 | 25,870 |
| 24 | 8.20 | 12,940 | ..... | 25,600 | 15.0 | 22,080 | 7.60 | 17,300 | 8.50 | 13,250 | 10.17 | 28,020 |
| 25 | 9.30 | 17,830 | ..... | 26,500 | 15.3 | 23,280 | 7.32 | 15,730 | 8.35 | 12,600 | 10.90 | 32,560 |
| 26 | 14.10*c* | 48,100 | ..... | 55,400 | 15.5 | 24,080 | 7.09 | 14,490 | 8.20 | 11,960 | 10.66 | 31,020 |
| 27 | 22.10 | 129,700 | ..... | 190,500 | 21.5 | 52,200 | 6.96 | 13,800 | 8.12 | 11,620 | 10.19 | 28,140 |
| 28 | 20.80 | 115,600 | ..... | 177,700 | 42.4 | 185,560 | 6.90 | 13,500 | 8.05 | 11,310 | 9.84 | 26,140 |
| 29 | 14.40 | 58,000 | ..... | 93,800 | 41.1 | 173,780 | 8.02 | 22,790 | 9.04 | 17,270 | 9.68 | 25,270 |
| 30 | 12.40*c* | 43,800 | ..... | 64,000 | 27.5 | 81,900 | 15.08*a* | 84,170 | 15.21 | 93,430 | 9.84 | 27,508 |

NOTE.—Owing to constantly shifting conditions, it is impossible to make accurate estimates of the discharge at Battleford during high water and flood stages, therefore the discharges given in this table for Battleford are only very approximate.

DAILY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River at all Stations, for July 1915

TABLE F.4

| Day. | Rocky Mt. House. | | Rocky Rapids. | | Edmonton. | | Battleford. North Channel. | | Battleford. South Channel. | | Prince Albert. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 10.80*c* | 33,600 | ..... | 50,000 | 23.9 | 61,260 | 13.42*a* | 71,880 | 14.24 | 70,810 | 20.40*a* | 139,945 |
| 2 | 9.40 | 25,400 | ..... | 45,000 | 20.9 | 45,500 | 11.21 | 43,930 | 11.73 | 33,830 | 25.98*a* | 186,546 |
| 3 | 9.20 | 24,300 | ..... | 44,500 | 19.7 | 39,560 | 10.46 | 38,500 | 11.04 | 28,010 | 20.66*a* | 107,171 |
| 4 | 9.10 | 23,750 | ..... | 41,500 | 19.6 | 39,080 | 10.38 | 37,910 | 11.02 | 27,860 | 15.31*a* | 64,000 |
| 5 | 9.10 | 23,750 | ..... | 40,700 | 19.3 | 37,680 | 10.34 | 37,670 | 11.01 | 27,780 | 14.51*a* | 58,991 |
| 6 | 9.04 | 23,420 | ..... | 40,400 | 19.1 | 36,760 | 9.40 | 30,800 | 10.40 | 23,550 | 14.43 | 58,610 |
| 7 | 8.84 | 22,320 | ..... | 41,300 | 19.0 | 36,300 | 8.75 | 26,350 | 9.73 | 19,410 | 14.22 | 56,850 |
| 8 | 8.87 | 22,485 | ..... | 41,800 | 19.2 | 37,220 | 8.45 | 24,390 | 9.40 | 17,590 | 13.54 | 51,320 |
| 9 | 8.20 | 19,100 | ..... | 39,000 | 19.3 | 37,680 | 8.40 | 24,080 | 9.35 | 17,330 | 12.87 | 46,240 |
| 10 | 7.96 | 17,920 | ..... | 38,600 | 18.7 | 34,950 | 8.38 | 23,960 | 9.34 | 17,280 | 12.41 | 42,870 |
| 11 | 7.53 | 15,985 | ..... | 38,000 | 18.7 | 34,950 | 8.25 | 23,150 | 9.21 | 16,620 | 12.12 | 40,840 |
| 12 | 7.48 | 15,760 | ..... | 34,000 | 18.5 | 34,050 | 8.10 | 22,220 | 9.00 | 15,550 | 12.12 | 40,840 |
| 13 | 8.80 | 17,200 | ..... | 35,500 | 17.7 | 30,480 | 8.05 | 21,910 | 8.90 | 15,090 | 12.16 | 41,120 |
| 14 | 11.05 | 35,100 | ..... | 38,000 | 17.9 | 31,360 | 7.80 | 20,400 | 8.66 | 13,990 | 12.18 | 41,260 |
| 15 | 9.85 | 27,900 | ..... | 94,200 | 18.5 | 34,050 | 7.72 | 19,920 | 8.56 | 13,530 | 11.94 | 39,580 |
| 16 | 10.00 | 28,800 | 14.43 | 90,670 | 28.9 | 90,200 | 7.68 | 19,680 | 8.55 | 13,480 | 11.75 | 38,250 |
| 17 | 11.25 | 36,325 | 11.84 | 67,740 | 27.6 | 82,480 | 7.46 | 18,380 | 8.24 | 12,130 | 11.63 | 37,410 |
| 18 | 10.65 | 32,700 | 11.93 | 68,505 | 25.6 | 70,880 | 10.60 | 39,560 | 11.50 | 31,900 | 11.38 | 35,710 |
| 19 | 9.62 | 26,610 | 11.03 | 61,040 | 25.1 | 67,980 | 12.33 | 53,570 | 13.20 | 50,100 | 11.00 | 33,200 |
| 20 | 9.25 | 24,575 | 10.13 | 53,840 | 23.2 | 57,480 | 11.60 | 47,160 | 12.26 | 38,810 | 15.63 | 69,450 |
| 21 | 8.85 | 22,375 | 9.58 | 49,440 | 21.9 | 50,680 | 11.44 | 45,940 | 12.17 | 38,000 | 16.88 | 81,950 |
| 22 | 8.65 | 21,350 | 8.93 | 44,240 | 20.9 | 45,500 | 11.10 | 43,360 | 12.00 | 36,500 | 16.49 | 77,900 |
| 23 | 8.52 | 20,700 | 8.58 | 41,440 | 19.7 | 39,560 | 10.46 | 38,500 | 10.96 | 28,000 | 16.00 | 73,000 |
| 24 | 8.18 | 19,000 | 8.33 | 39,475 | 19.5 | 38,600 | 10.05 | 35,470 | 10.55 | 25,100 | 15.32 | 66,180 |
| 25 | 7.82 | 17,290 | 7.54 | 33,550 | 18.9 | 35,850 | 9.35 | 30,450 | 10.05 | 22,000 | 14.55 | 59,640 |
| 26 | 7.70 | 16,750 | 7.23 | 31,225 | 18.4 | 33,600 | 9.05 | 28,350 | 9.76 | 20,300 | 13.94 | 54,520 |
| 27 | 7.58 | 16,210 | 6.98 | 29,350 | 17.6 | 30,040 | 8.92 | 27,470 | 9.55 | 19,300 | 13.44 | 50,500 |
| 28 | 7.48 | 15,760 | 6.58 | 26,350 | 17.2 | 28,340 | 8.57 | 25,160 | 9.18 | 18,100 | 12.95 | 46,830 |
| 29 | 8.05 | 18,350 | 6.38 | 24,860 | 16.8 | 26,670 | 8.22 | 22,960 | 8.86 | 15,800 | 12.66 | 44,680 |
| 30 | 7.75 | 16,975 | 6.98 | 29,350 | 16.8 | 26,670 | 7.96 | 21,360 | 8.62 | 14,700 | 12.34 | 42,380 |
| 31 | 7.90 | 17,650 | 6.78 | 27,850 | 16.9 | 27,080 | 7.70 | 19,800 | 8.36 | 13,700 | 11.88 | 39,160 |

NOTE.—Owing to constantly shifting conditions, it is impossible to make accurate estimates of the discharge at Battleford during high water and flood stages, therefore the discharges given in this table for Battleford are only approximate.

HOURLY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River at Edmonton, for June-July Flood of 1915.

TABLE F.5

| Hour. | June 26. | | June 27. | | June 28. | | June 29. | | June 30. | | July 1. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 15.50 | 24,080 | 16.9 | 29,900 | 30.80 | 105,400 | 44.8 | 202,640 | 33.0 | 116,000 | 25.3 | 69,140 |
| 2 | 15.56 | 24,080 | 17.1 | 30,760 | 31.60 | 110,320 | 44.4 | 199,520 | 32.5 | 112,800 | 25.1 | 67,980 |
| 3 | 15.50 | 24,080 | 17.3 | 31,640 | 32.40 | 115,280 | 44.2 | 197,960 | 32.1 | 110,240 | 25.0 | 67,400 |
| 4 | 15.50 | 24,080 | 17.5 | 32,520 | 33.20 | 120,280 | 43.8 | 194,840 | 31.6 | 107,040 | 24.8 | 66,280 |
| 5 | 15.50 | 24,080 | 17.7 | 33,440 | 34.00 | 125,400 | 43.5 | 192,500 | 31.2 | 104,480 | 24.7 | 65,720 |
| 6 | 15.50 | 24,080 | 17.8 | 33,900 | 34.80 | 130,680 | 43.2 | 190,160 | 30.7 | 101,340 | 24.5 | 64,600 |
| 7 | 15.50 | 24,080 | 18.0 | 34,820 | 35.60 | 136,080 | 43.0 | 188,600 | 30.3 | 98,860 | 24.3 | 63,480 |
| 8 | 15.50 | 24,080 | 18.7 | 38,040 | 36.40 | 141,520 | 42.8 | 187,040 | 29.8 | 95,760 | 24.2 | 62,920 |
| 9 | 15.50 | 24,080 | 19.4 | 41,400 | 37.20 | 146,960 | 42.6 | 185,480 | 29.4 | 93,280 | 24.1 | 62,360 |
| 10 | 15.50 | 24,080 | 20.1 | 44,920 | 38.40 | 155,200 | 41.9 | 180,020 | 28.9 | 90,200 | 23.9 | 61,260 |
| 11 | 15.55 | 24,280 | 20.8 | 48,560 | 39.20 | 160,880 | 41.0 | 173,000 | 28.5 | 87,800 | 23.8 | 60.720 |
| 12 | 15.60 | 24,480 | 21.5 | 52,200 | 40.10 | 167,540 | 40.3 | 167,540 | 28.0 | 84,800 | 23.7 | 60,180 |
| 13 | 15.65 | 24,680 | 22.2 | 55,880 | 40.80 | 172,720 | 39.5 | 161,400 | 27.6 | 82,480 | 23.6 | 59,640 |
| 14 | 15.70 | 24,880 | 22.8 | 59,120 | 41.40 | 177,160 | 38.8 | 156,160 | 27.1 | 79,580 | 23.4 | 58,560 |
| 15 | 15.75 | 25,080 | 23.5 | 62,900 | 42.00 | 181,600 | 38.0 | 150,400 | 26.9 | 78,420 | 23.3 | 58,020 |
| 16 | 15.80 | 25,280 | 24.1 | 66,180 | 42.60 | 186,040 | 37.2 | 144,640 | 26.7 | 77,260 | 23.2 | 57,480 |
| 17 | 15.85 | 25,490 | 24.6 | 69,080 | 43.10 | 189 700 | 36.6 | 140,400 | 26.6 | 76,680 | 23.1 | 56,940 |
| 18 | 15.90 | 25,700 | 25.3 | 73,140 | 43.70 | 194,320 | 36.2 | 137,600 | 26.3 | 74,940 | 22.9 | 55,880 |
| 19 | 15.95 | 25,910 | 26.1 | 77,780 | 44.10 | 197,360 | 35.7 | 134,100 | 26.2 | 74,360 | 22.8 | 55,360 |
| 20 | 16.00 | 26,120 | 26.9 | 82,420 | 44 40 | 199,640 | 35.2 | 130,600 | 26.0 | 73,200 | 22.7 | 54,840 |
| 21 | 16.20 | 26,960 | 27.7 | 87,060 | 44.70 | 201,920 | 34.8 | 127,840 | 25.8 | 72,040 | 22.6 | 54,320 |
| 22 | 16 40 | 27,800 | 28.5 | 91,700 | 44.80 | 202,680 | 34.4 | 125,120 | 25.7 | 71,460 | 22.4 | 53,280 |
| 23 | 16.60 | 28,640 | 29.3 | 96,400 | 45.04 | 204,500 | 33.9 | 121,760 | 25.6 | 70,880 | 23.3 | 52,760 |
| 24 | 16.70 | 29,060 | 30.0 | 100,600 | 45.04 | 204,500 | 33.5 | 119,200 | 25.4 | 69,720 | 22.2 | 52,240 |
| Mean | 25,215 | | 57,223 | | 163,643 | | 162,855 | | 87,651 | | 60,057 | |
| Run-off acre-feet | 50,000 | | 113,473 | | 324,504 | | 322,941 | | 173,812 | | 119,093 | |

HOURLY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River (North Channel), at Battleford, for 1915.

TABLE F.6

| Hour. | June 29. | | June 30. | | July 1. | | July 2. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft* | *Feet.* | *Sec.-ft.* |
| 1 | 6.93 | 15,550 | 13.10 | 60,920 | 15.52 | 89,680 | 12.20 | 52,400 |
| 2 | 6.94 | 15,600 | 13.40 | 63,980 | 15.51 | 89,540 | 12.09 | 51,410 |
| 3 | 6.94 | 15,600 | 13.85 | 68,850 | 15.50 | 89,400 | 11.98 | 50,430 |
| 4 | 6.95 | 15,650 | 14.20 | 72,860 | 15.50 | 89,400 | 11.88 | 49,570 |
| 5 | 6.95 | 15,650 | 14.55 | 77,050 | 15.40 | 88,060 | 11.75 | 48,450 |
| 6 | 6.96 | 15,700 | 14.70 | 78,920 | 15.25 | 86,050 | 11.65 | 47,590 |
| 7 | 6.97 | 15,750 | 14.90 | 81,440 | 15.10 | 84,040 | 11.54 | 46,640 |
| 8 | 6.97 | 15,750 | 15.10 | 84,040 | 14.90 | 81,440 | 11.45 | 45,880 |
| 9 | 6.98 | 15,800 | 15.25 | 86,050 | 14.70 | 78,920 | 11.36 | 45,120 |
| 10 | 6.98 | 15,800 | 15.43 | 88,460 | 14.50 | 76,400 | 11.28 | 44,450 |
| 11 | 6.99 | 15,850 | 15.45 | 88,730 | 14.30 | 74,040 | 11.20 | 43,780 |
| 12 | 6.99 | 15,850 | 15.46 | 88,860 | 14.05 | 71,090 | 11.10 | 42,940 |
| 13 | 6.99 | 15,850 | 15.48 | 89,130 | 13.90 | 69,400 | 11.00 | 42,100 |
| 14 | 7.00 | 15,900 | 15.49 | 89,370 | 13.70 | 67,200 | 10.92 | 41,440 |
| 15 | 7.00 | 15,900 | 15.49 | 89,370 | 13.50 | 65,000 | 10.84 | 40,790 |
| 16 | 7.00 | 15,900 | 15.50 | 89,400 | 13.30 | 62,960 | 10.82 | 40,620 |
| 17 | 7.65 | 19,500 | 15.60 | 90,820 | 13.10 | 60,920 | 10.80 | 40,460 |
| 18 | 8.30 | 23,460 | 15.59 | 90,680 | 12.90 | 58,940 | 10.80 | 40,460 |
| 19 | 9.00 | 28,000 | 15.58 | 90,540 | 12.80 | 57,980 | 10.78 | 40,300 |
| 20 | 9.65 | 32,580 | 15.58 | 90,540 | 12.70 | 57,020 | 10.76 | 40,140 |
| 21 | 10.35 | 37,690 | 15.56 | 90,260 | 12.60 | 56,060 | 10.75 | 40,060 |
| 22 | 11.00 | 42,600 | 15.55 | 90,110 | 12.50 | 55,100 | 10.74 | 39,960 |
| 23 | 12.05 | 51,050 | 15.54 | 89,970 | 12.40 | 54,200 | 10.72 | 39,800 |
| 24 | 13.00 | 59,900 | 15.52 | 89,680 | 12.30 | 53,300 | 10.70 | 39,640 |
| Mean | 22,790 | | 84,170 | | 71,880 | | 43,930 | |
| Run-off acre-feet | 45,193 | | 166,909 | | 142,538 | | 87,113 | |

NOTE.—Owing to constantly shifting conditions, it is impossible to make accurate estimates of the discharge, during high water and flood stages, therefore the discharges given in this table are only very approximate.

HOURLY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River (South Channel), at Battleford, for 1915.

TABLE F.7

| Hour. | June 29. | | June 30. | | July 1. | | July 2. | |
|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 8.05 | 11,315 | 12.90 | 45,800 | 15.65 | 105,000 | 12.70 | 43,400 |
| 2 | 8.05 | 11,315 | 13.50 | 54,000 | 15.63 | 104,400 | 12.60 | 42,200 |
| 3 | 8.05 | 11,315 | 14.45 | 71,450 | 15.60 | 103,500 | 12.49 | 40,900 |
| 4 | 8.05 | 11,315 | 14.60 | 75,100 | 15.50 | 100,500 | 12.30 | 38,960 |
| 5 | 8.05 | 11,315 | 14.72 | 78,220 | 15.40 | 97,500 | 12.27 | 38,650 |
| 6 | 8.10 | 11,530 | 14.83 | 81,080 | 15.26 | 93,300 | 12.16 | 37,530 |
| 7 | 8.10 | 11,530 | 14.95 | 84,200 | 15.10 | 88,500 | 12.05 | 36,410 |
| 8 | 8.10 | 11,530 | 15.08 | 87,900 | 14.90 | 82,900 | 11.96 | 35,560 |
| 9 | 8.10 | 11,530 | 15.20 | 91,500 | 14.72 | 78,220 | 11.88 | 34,870 |
| 10 | 8.10 | 11,530 | 15.30 | 94,500 | 14.55 | 73,800 | 11.80 | 34,180 |
| 11 | 8.10 | 11,530 | 15.43 | 98,400 | 14.40 | 70,400 | 11.70 | 33,320 |
| 12 | 8.10 | 11,530 | 15.57 | 102,600 | 14.20 | 66,200 | 11.60 | 32,460 |
| 13 | 8.10 | 11,530 | 15.59 | 103,200 | 14.09 | 63,890 | 11.52 | 31,770 |
| 14 | 8.10 | 11,530 | 15.60 | 103,500 | 13.94 | 61,040 | 11.43 | 31,050 |
| 15 | 8.10 | 11,530 | 15.60 | 103,500 | 13.80 | 58,800 | 11.34 | 30,350 |
| 16 | 8.10 | 11,530 | 15.60 | 103,500 | 13.70 | 57,200 | 11.33 | 30,270 |
| 17 | 8.80 | 14,630 | 15.80 | 109,500 | 13.56 | 54,960 | 11.32 | 30,200 |
| 18 | 9.50 | 18,100 | 15.80 | 109,500 | 13.40 | 52,600 | 11.31 | 30,120 |
| 19 | 10.10 | 21,600 | 15.78 | 108,900 | 13.30 | 51,200 | 11.30 | 30,040 |
| 20 | 10.80 | 26,300 | 15.77 | 108,600 | 13.20 | 49,800 | 11.30 | 30,040 |
| 21 | 11.50 | 31,600 | 15.75 | 108,000 | 13.10 | 48,400 | 11.30 | 30,040 |
| 22 | 12.10 | 36,920 | 15.73 | 107,400 | 13.00 | 47,000 | 11.29 | 29,960 |
| 23 | 12.37 | 39,670 | 15.70 | 106,500 | 12.90 | 45,800 | 11.28 | 29,880 |
| 24 | 12.60 | 42,200 | 15.68 | 105,900 | 12.80 | 44,600 | 11.26 | 29,730 |
| Mean | 17,270 | | 93,430 | | 70,810 | | 33,830 | |
| Run-off acre-feet | 34,246 | | 185,272 | | 140,416 | | 67,085 | |

NOTE.—Owing to constantly shifting conditions, it is impossible to make accurate estimates of the discharge during high water and flood stages, therefore the discharges given in this table are only very approximate.

HOURLY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River at Prince Albert, for July Flood of 1915.

TABLE F.8

| Hour. | June 30. | | July 1. | | July 2. | | July 3. | | July 4. | | July 5. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge. | Gauge Height. | Discharge | Gauge Height. | Discharge. | Gauge Height. | Discharge. |
| | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* | *Feet.* | *Sec.-ft.* |
| 1 | 9.64* | 25,100 | 14.20 | 72,025 | 25.20 | 195,400 | 24.80 | 155,000 | 16.60 | 71,100 | 14.68* | 60,380 |
| 2 | 9.63* | 25,050 | 15.10 | 80,500 | 25.40 | 197,135 | 24.50 | 150,500 | 16.40 | 70,000 | 14.66* | 60,260 |
| 3 | 9.63* | 25,050 | 15.90 | 88,300 | 25.60 | 198,900 | 24.20 | 146,000 | 16.21 | 68,900 | 14.64* | 60,140 |
| 4 | 9.63* | 25,050 | 16.50 | 94,400 | 25.80 | 199,900 | 23.90 | 142,000 | 16.01 | 67,600 | 14.62* | 60,020 |
| 5 | 9.62* | 25,000 | 17.10 | 100,500 | 25.90 | 200,000 | 23.50 | 136,610 | 15.86 | 66,900 | 14.60* | 59,900 |
| 6 | 9.62* | 25,000 | 17.80 | 108,400 | 26.10 | 200,000 | 23.10 | 131,700 | 15.71 | 66,000 | 14.58* | 59,700 |
| 7 | 9.62* | 25,000 | 18.30 | 113,560 | 26.20 | 199,665 | 22.90 | 129,100 | 15.71 | 66,000 | 14.56* | 59,500 |
| 8 | 9.62* | 25,000 | 18.80 | 119,500 | 26.30 | 198,400 | 22.50 | 124,500 | 15.57 | 65,200 | 14.54 | 59,300 |
| 9 | 9.61 | 24,950 | 19.16 | 123,400 | 26.32 | 196,700 | 22.15 | 120,100 | 15.47 | 64,900 | 14.50 | 58,900 |
| 10 | 9.61* | 24,950 | 19.70 | 130,300 | 26.35 | 194,500 | 21.70 | 114,680 | 15.32 | 64,000 | 14.49 | 58,835 |
| 11 | 9.61* | 24,950 | 20.00 | 134,000 | 26.37 | 192,000 | 21.10 | 108,000 | 15.27 | 63,600 | 14.47 | 58,740 |
| 12 | 9.61* | 24,950 | 20.50 | 140,100 | 26.39 | 189,300 | 20.70 | 104,000 | 15.22 | 63,500 | 14.46 | 58,660 |
| 13 | 9.61* | 24,950 | 21.00 | 146,500 | 26.42 | 187,270 | 20.40 | 101,000 | 15.13 | 63,000 | 14.46* | 58,580 |
| 14 | 9.60* | 24,900 | 21.40 | 151,500 | 26.40 | 186,100 | 20.00 | 97,000 | 15.03 | 62,500 | 14.45* | 58,500 |
| 15 | 9.60* | 24,900 | 21.70 | 155,100 | 26.37 | 185,000 | 19.60 | 93,500 | 14.98 | 62,200 | 14.45* | 58,500 |
| 16 | 9.60* | 24,900 | 22.30 | 162,500 | 26.33 | 183,800 | 19.20 | 90,000 | 14.93 | 62,000 | 14.45* | 58,500 |
| 17 | 9.60 | 24,900 | 22.70 | 167,100 | 26.25 | 181,800 | 18.80 | 86,500 | 14.93 | 62,000 | 14.44* | 58,420 |
| 18 | 9.60* | 24,900 | 23.00 | 170,600 | 26.20 | 180,500 | 18.40 | 83,230 | 14.84 | 61,500 | 14.44 | 58,420 |
| 19 | 9.60* | 24,900 | 23.20 | 172,885 | 26.10 | 178,000 | 18.10 | 81,500 | 14.84 | 61,500 | 14.44* | 58,420 |
| 20 | 9.60* | 24,900 | 23.50 | 176,300 | 25.90 | 173,500 | 17.80 | 79,100 | 14.79 | 61,000 | 14.44* | 58,420 |
| 21 | 9.60* | 24,900 | 24.00 | 182,000 | 25.70 | 170,000 | 17.50 | 77,000 | 14.74 | 60,800 | 14.44* | 58,420 |
| 22 | 9.66* | 26,500 | 24.50 | 187,500 | 25.50 | 166,500 | 17.20 | 74,795 | 14.74 | 60,800 | 14.44* | 58,420 |
| 23 | 11.76* | 51,000 | 24.65 | 189,500 | 25.30 | 162,655 | 17.00* | 73,800 | 14.70 | 60,500 | 14.44* | 58,420 |
| 24 | 12.61* | 58,500 | 24.90 | 192,200 | 25.10 | 160,000 | 16.80* | 72,500 | 14.70 | 60,500 | 14.44* | 58,420 |
| Mean | 27,508 | | 139,945 | | 186,546 | | 107,171 | | 64,000 | | 58,991 | |
| Run-off acre-feet | 54,548 | | 277,511 | | 369,920 | | 212,520 | | 126,912 | | 116,979 | |

*Gauge heights before 1 a.m., July 1, and after 11 p.m., July 3, are interpolated from gauge heights observed at our gauge and at Public Works wharf.

## ATHABASKA RIVER DRAINAGE BASIN.

### *General Description.*

Athabaska River rises on the eastern slope of Rocky Mountains and flows in a northeasterly direction for about one thousand miles, eventually emptying into Lake Athabaska.

The Athabaska basin forms the most southerly portion of the great Mackenzie system and the portion dealt with in this report comprises only the headwaters.

Rising in country very similar to the watershed of the other streams of importance in Alberta it flows out of the mountains and then through foothill country. From the foothills to the lake the basin consists of stretches of muskeg and uplands, well timbered with spruce and pine.

The general character of the basin is such that the winter precipitation or snow cover is conserved to a great extent and floods in the early spring are not usual. However, in June, July and August, rains and warm winds cause the upper parts of the system to discharge large quantities of the snow water from the higher peaks and glaciers and when rains of any magnitude occur the invariable result is a flood. The muskeg country is a great source of storage, but when its capacity is reached, it accelerates rather then retards the run-off.

The principal tributaries of the upper part of this stream from its headwaters eastward entering from the south are Maligne, Rocky, Macleod and Pembina Rivers, and from the north and west Whirlpool, Miette, Snaring, Stony and Baptiste Rivers. Lower down on its course it is augmented by the Lesser Slave, Moose, Clearwater Rivers and a number of lesser streams.

### *Former Floods.*

No records of previous floods on this stream are available although such floods are known to have occurred. That of 1899 probably was the largest in recent years.

Mr. Swift, the oldest resident of the Yellowhead pass, stated that the flood of 1915 was the largest he has witnessed at Jasper; however, at Athabaska it did not reach as high a stage as previous floods.

### *Causes of the Flood of June, 1915.*

The precipitation on the headwaters of the Athabaska and those streams rising south of the Yellowhead Pass was high in June and on the headwaters of the Macleod at Mountain Park reached the excessive total of 12.26 inches, with a fall of 3.35 inches on a single day. This was probably over a small area only but may have covered a larger extent. The conditions of this part of the basin were similar to those to the south and were therefore in fit condition for rapid run-offs. (See Introduction *re* Precipitation and Temperature.)

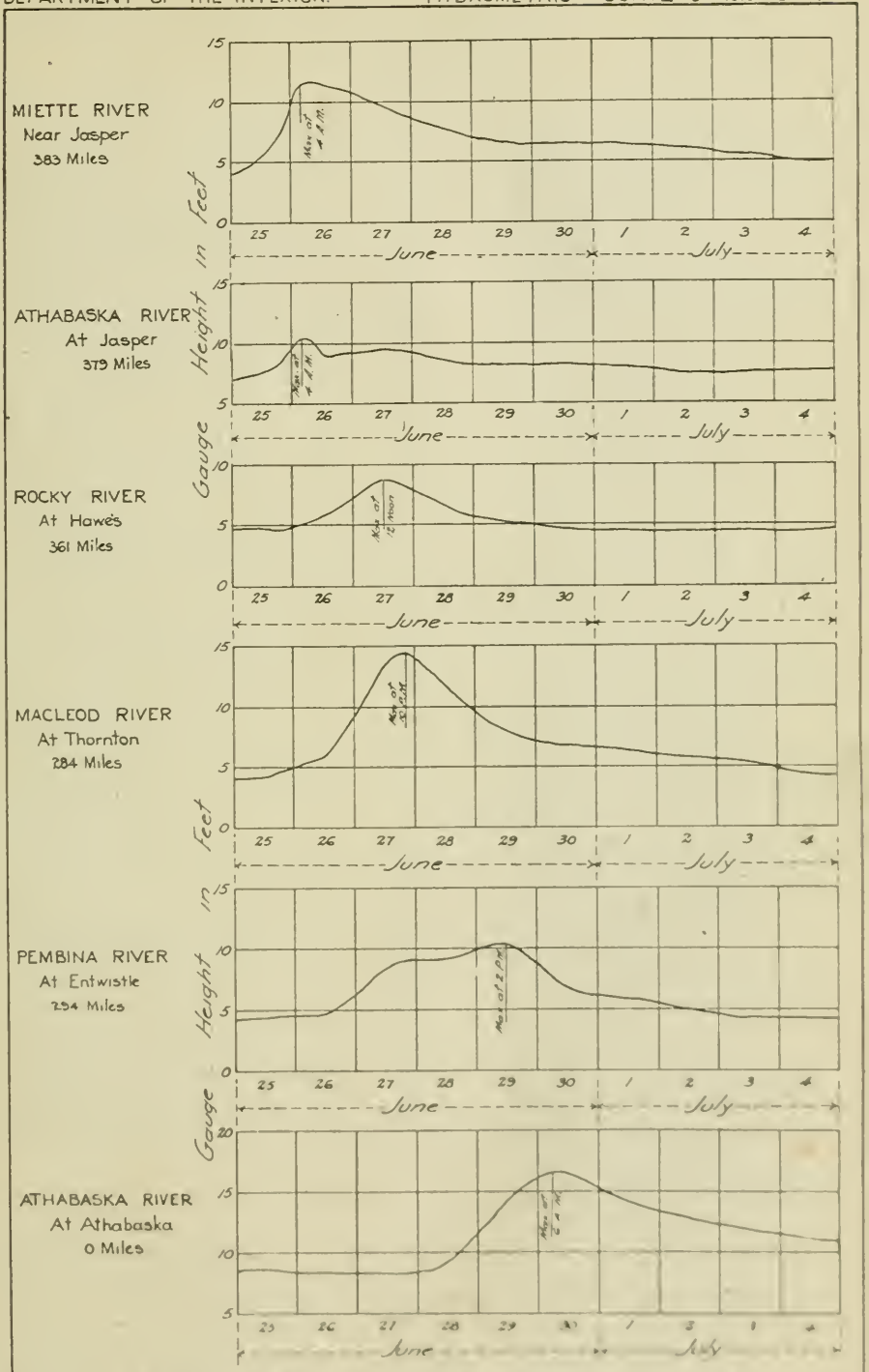
### *Progress of the Flood.*

The Athabaska at Jasper began to rise on June 25, and reached its maximum about 4 a.m., June 27, with a stage of 10.20 feet and flow of 19,500 sec.-ft. The Macleod at Thornton began to rise June 26, and was at its crest June 27, about 10 p.m., with a stage of 14.13 feet and flow of 23,850 sec.-ft. The Athabaska at Athabaska began to rise on June 28 and on June 30 at 6 a.m. reached a stage of 16.5 feet with a discharge of 101,800 sec.-ft. Plate G 1 shows the progress of the crest of the flood down the stream in a clear manner.

### *Damages.*

The floods in this basin did not do a great deal of damage as there is little settlement close to the banks of any of the streams. The tracks of the Grand Trunk Pacific and Canadian Northern railways along the Athabaska were damaged to some extent by washouts and slides.

DEPARTMENT OF THE INTERIOR. HYDROMETRIC SURVEYS—1915-PLATE G1.




FLOOD HYDROGRAPHS (GAUGE HEIGHTS) FOR SIX STATIONS IN ATHABASKA RIVER DRAINAGE BASIN FROM JUNE 25 TO JULY 4, 1915.

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IRRIGATION BRANCH.

## LIST OF PUBLICATIONS.

IRRIGATION REPORTS—1906–7–8–9–11–12–13–14 and 15.

STREAM MEASUREMENT REPORTS—1909 to 1914.

BULLETIN No. 1—Irrigation in Saskatchewan and Alberta.

BULLETIN No. 2—Alfalfa Culture.

BULLETIN No. 3—Report on the Climatic and Soil Conditions in the Canadian Pacific Railway Company's Irrigation Project, Western Section (near Calgary).

BULLETIN No. 4—Duty of Water Experiments and Farm Demonstration Work.

PAMPHLET—Address by Dr. J. G. Rutherford on "Inter-dependence of Farm and City."

PAMPHLET—Address by Mr. Don H. Bark on "The Actual Problem that Confronts the Irrigator."

PAMPHLET—Address by Mr. S. G. Porter on "The Practical Operation of Irrigation Works."

Annual Reports of the Proceedings of the Western Canada Irrigation Association, 1907 to 1914.

(Note:—The Report for 1907 is issued as Appendix "B" in the Annual Report on Irrigation for 1906 and 1907.)

Report of the Proceedings of the 21st International Irrigation Congress held at Calgary, Alberta, October, 1914.

# FOURTEENTH REPORT

OF THE

# GEOGRAPHIC BOARD OF CANADA

CONTAINING ALL DECISIONS TO MARCH 31

1915

*PRINTED BY ORDER OF PARLIAMENT.*

OTTAWA
PRINTED BY J. DE L. TACHÉ, PRINTER TO THE KING'S MOST
EXCELLENT MAJESTY
1916

[No. 25*d*—1916.]

To the Hon. W. J. Roche, M.P.,
Minister of the Interior,
Ottawa.

Sir,—I have the honour to submit the Fourteenth Report of the Geographic Board of Canada, to be printed as a supplement to the Annual Report of the Department of the Interior. A large addition of decisions is included in the consolidation which has been completed to the end of the fiscal year, March 31, 1915.

I have the honour to be, sir,

Your obedient servant,

E. DEVILLE,

*Chairman of the Board.*

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# ORDER IN COUNCIL

## *THE CANADA GAZETTE.*

OTTAWA, Saturday, June 25, 1898.

[8324]

AT THE GOVERNMENT HOUSE AT OTTAWA.

SATURDAY, DECEMBER 18, 1897.

PRESENT:

HIS EXCELLENCY THE GOVERNOR GENERAL IN COUNCIL.

His Excellency, by and with the advice of the Queen's Privy Council of Canada is pleased to create a 'Geographic Board' to consist of one member for each of the Departments of the Geological Survey, Railways and Canals, Post Office, and Marine and Fisheries, such member, being appointed by the Minister of the department; of the Surveyor General of Dominion Lands, of such other members as may from time to time be appointed by Order in Council, and of an officer of the Department of the Interior, designated by the Minister of the Interior, who shall act as secretary of the Board; and to authorize the Board to elect its chairman and to make such rules and regulations for the transaction of its business as may be requisite.

His Excellency is further pleased to order and direct, that all questions concerning geographic names in the Dominion which arise in the departments of the public service shall be referred to the Board, and that all departments shall accept and use in their publications the names and orthography adopted by the Board.

JOHN J. McGEE,
*Clerk of the Privy Council.*

*Extract from Order in Council dated December 14, 1899.*

"That the Order in Council constituting the Board be amended by giving to the government of the Northwest Territories and to each Province the right to nominate one of their officials as a member of the Board who shall advise the Board with reference to names in his Province, provided that the several governments undertake to be guided by the decisions of the Board."

# MEMBERS OF THE GEOGRAPHIC BOARD OF CANADA

## Chairman

E. Deville, LL.D., F.R.S.C., Surveyor-General of Dominion Lands.

## Secretary

A. H. Whitcher, F.R.G.S., Department of the Interior.

## Executive Committee

D. B. Dowling, B.A.Sc., F.R.S.C., Geologist, Geological Survey, Department of Mines.

C. O. Senécal, C.E., B.A.Sc., Geographer and Chief Draughtsman, Geological Survey, Department of Mines.

James White, F.R.G.S., F.R.S.C., Assistant to Chairman, and Deputy Head, Commission of Conservation.

## Members

Lieut.-Col. Wm. P. Anderson, C.M.G., F.R.G.S., Chief Engineer, Department of Marine and Fisheries.

W. H. Boyd, Chief Topographer, Geological Survey, Department of Mines.

J. E. Chalifour, Chief Geographer, Department of the Interior.

A. G. Doughty, C.M.G., Litt.D., Dominion Archivist and Deputy Head.

E. V. Johnson, M. Can. Soc. C.E., Inspecting Engineer, Department of Railways and Canals.

Major P. de L. D. Passy, R.C.E., Assistant Director of Military Surveys, Militia Department.

W. J. Stewart, M. Can. Soc. C.E., Chief Hydrographer, Department of the Naval Service.

## Provincial Representative Members

*(Order in Council, December 14, 1899.)*

**Ontario—**

*L. V. Rorke, Surveys Branch, Department of Lands and Forests, Toronto, Ont.

**Quebec—**

Eugene Rouillard, F.R.S.C., Quebec Geographic Board, Quebec, Que.

**New Brunswick—**

Wm. S. Carter, M.A., LL.D., Superintendent of Education, Fredericton, N.B.

**Nova Scotia—**

A. H. MacKay, B.A., LL.D., F.R.S.C., Superintendent of Education, Halifax, N.S.

**Prince Edward Island—**

Hon. M. McKinnon, Provincial Secretary, (ex-officio), Charlottetown, P.E.I.

**British Columbia—**

Wm. Fleet Robertson, B.A.Sc., Mining Engineer, Provincial Mineralogist, Victoria, B.C.

**Alberta—**

L. C. Charlesworth, Deputy Minister of Public Works, Edmonton, Alta.

**Saskatchewan—**

A. J. McPherson, Chairman, Local Government Board, Regina, Sask.

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* Succeeding Aubrey White, C.M.G., deceased.

# GEOGRAPHIC BOARD OF CANADA

## BY-LAWS.

### I—Officers of the Board.

The officers shall consist of a chairman (who shall be elected by ballot), of an executive committee of three to be nominated by the chair and approved by the Board, all of whom shall serve for one year or until their successors shall be chosen, and of the secretary.

### II—Duties of Officers.

(*a.*) The chairman shall preside at the meetings and shall certify to the decisions of the Board. He shall appoint all committees not specially named by the Board. In his absence the Board shall have power to elect a temporary chairman.

(*b.*) The secretary shall keep minutes of the proceedings of the Board and shall record the decisions rendered, or other action of the Board upon cases submitted to it, with reference to the papers filed in each case. He shall maintain files of the original papers, or copies of them, that may be presented in each case, conveniently arranged for reference. He shall, under the instructions of the Board, conduct the general correspondence and shall receive communications presented for the consideration of the Board.

(*c.*) The executive committee shall receive through the secretary all communications requiring decision by the Board, shall investigate the questions presented, and after securing information from all available sources, shall report to the Board with recommendations regarding them.

(*d.*) Before dealing with any name within a province represented upon the Board, such name shall be submitted to the representative of said province for examination and report.

(*e.*) Upon the receipt of a communication submitting place-names for the consideration of the Board, it shall be the duty of the secretary, after preliminary submission to the executive committee, to transmit at once a copy of such communication, together with any papers relating thereto, to the member of the Board for the province affected, and also, in the case of coast names appearing on admiralty charts, to the hydrographer of the admiralty.

(*f.*) So soon as the report of the provincial representative, and in the case of chart names, the report of the hydrographer, are received, the secretary shall immediately submit the whole correspondence to the executive committee who shall promptly prepare the names for submission to the Board.

(*g.*) The secretary shall enter upon every record submitted for the consideration of the Board, the recommendation of the provincial representative, and, if any, the recommendation of the hydrographer.

### III—Meetings.

The Board shall hold regular meetings on the first Tuesday in each month. Special meetings may be called by the chairman or by the executive committee. Five members of the Board shall constitute a quorum, but on the written request of any member, filed with the secretary of the Board within a month from the date of a meeting, any decision adopted at such meeting shall be reserved for approval by a

majority of the full Board. The affirmative vote of a majority of all the members of the full Board shall be required for the final decision in any case. All motions presented for the consideration of the Board shall be submitted in writing.

### IV—Reports.

The Board shall publish its decisions on geographic names, after each meeting, in the *Canada Gazette* and in bulletins, the same to be consolidated in a general report of the Board's work, to be issued after the 31st of March in each year.

### V—Amendment.

These by-laws may be amended at any regular or special meeting, by a majority vote of all the members of the Board, provided that copies of the proposed amendment have been sent by the secretary to the members of the board at least twenty days previous to the time the vote is taken.

# RULES OF NOMENCLATURE.

1. When the priority of a name has been established by publication, particularly when such publication has occurred in any standard or authoritative work or works, that name should, if possible, be retained.

2. When names have been changed or corrected, if not too firmly established by local usage or otherwise, the original forms should be restored.

3. In cases where what was evidently originally the same word, appears with various spellings sanctioned by local usage or otherwise, these various spellings when applied to different features should be regarded as in effect different names, and as a rule it is inadvisable to attempt to produce uniformity.

4. As a rule the first published name should be retained, but where a choice is offered between two or more names for the same place or locality, all sanctioned by local usage, that which is most appropriate and euphonious should be adopted.

5. The possessive form should be avoided whenever it can be done without destroying the euphony of the name or changing its descriptive application. Where the possessive form is retained, the apostrophe should be dropped.

6. It is desirable to avoid the use of hyphens to connect parts of Indian names

7. Names consisting of more than one word may be connected by hyphens or combined in one word as may be advisable.

8. It is desirable to avoid the use of the words city and town as parts of names.

9. The form "canyon" may be used instead of "cañon," but the latter is preferable.

10. The term "brook" is considered preferable to "creek" for designating small streams, and will be adopted in cases where the latter has not become too firmly fixed.

11. The Board suggests that the initial letters of generic or descriptive parts of geographical names, when used in reports or other documents, should not be capitals.

12. The use of alternative names should be discontinued where possible or not inconvenient.

13. Geographical names in a foreign country should be rendered in the form adopted by that country, except where there are English equivalents already fixed by usage.

14. French names in Canada are to be spelt, accented, hyphenated, &c., according to the rules of the French language.

15. In cases where names already exist, and have been published in both English and French form and have been sanctioned by long usage, no attempt shall be made to abolish either form, but both may be recognized and published in the Board's lists of decisions and it shall be deemed correct to use either form in official documents in either language. In all other cases any duplication of form shall be discouraged and preference shall be given to the form which has priority of origin, whether this be English or French.

16. In English text and map printing, the use of hyphens for composite French names, though it is recommended, shall not be considered obligatory.

17. The spelling of native geographical names should represent, approximately, the true sounds of the words as pronounced in the native tongue. In the orthography of names of Indian origin in the province of Quebec, the rules of the Board, based on those of the Royal Geographical Society, are preferable to French practice as being simpler and in accordance with international usage, and shall be followed in the case of new names.

18. Where a generic descriptive term, such as Cape, Bay, River, etc. is added to a name, it is permissible to translate such term into French for use in French

publications, or into English for use in English publications, if it can be done without producing a mixture of English and French.

19. The Board adopts the rules of the Royal Geographical Society for the orthography of geographical names, of which the broad features are as follows:—

(*a*) The vowels are to be pronounced as in Italian and the consonants as in English.

(*b*) Every letter is pronounced, and no redundant letters are introduced. When two vowels come together each one is sounded, though the result, when spoken quickly, is sometimes scarcely to be distinguished from a single sound, as in *ai, au, ei.*

(*c*) One accent only is used, the acute, to denote the syllable on which stress is laid. This is very important, as the sounds of many names are entirely altered by the misplacement of this "stress."

The following amplification of the foregoing rules explains their application:—

| Letters. | Pronunciation and Remarks. | Examples. |
|---|---|---|
| a | *ah, a* as in *father*.. .. .. ..... ..... . .... ..... | Java, Banana, Somali, Bari. |
| e | *eh, a* as in *fate*. ..... ..... ..... ... ..... | Tel el Kebir, Oleleh, Yezo, Medina, Levuka, Peru. |
| i | English *e; i* as in *ravine;* the sound of *ee* in *beet*. Thus, not *Feejee*, but | Fiji, Hindi. |
| o | *o* as in *mote*..... .... ..... .. ..... | Tokyo. |
| u | long *u* as in *flute;* the sound of *oo* in *boot*. *oo* or *ou* should never be employed for this sound.....Thus, not *Zooloo*, but | Zulu, Sumatra. |
| | *All vowels are shortened in sound by doubling the following consonant*..... ..... .... | Yarra, Tanna, Mecca, Jidda |
| | Doubling a vowel is only necessary when there is a distinct repetition of the single sound. | Nuulua, Oosima. |
| ai | as in *aisle*, or English *i* as in *ice*..... ..... | Shanghai. |
| au | *ow* as in *how*..... ..... Thus, not *Foochow*, but | Fuchau. |
| ao | is slightly different from above ..... .... .. ..... ..... | Macao. |
| aw | when followed by a consonant or at the end of a word, as in *law*..... | Cawnpore. |
| ei | is the sound of the two Italian vowels, but is frequently slurred over, when it is scarcely to be distinguished from *ei* in the English *eight* or *ey* in the English *they*. | Beirut, Beilul. |
| b | English *b*. | |
| c | is always soft, but is so nearly the sound of *s* that it should be seldom used. | Celebes. |
| | If *Celebes* were not already recognized it would be written *Selebes*. | |
| ch | is always soft as in *church*..... ..... ..... ..... | Chingchin. |
| d | English *d*. | |
| f | English *f*. *ph* should not be used for the sound of *f*. Thus, not *Haiphong*, but | Haifong, Nafa. |
| g | is always hard. (Soft *g* is given by *j*)..... ..... | Galapagos. |
| h | is always pronounced when inserted. | |
| hw | as in *what*; better rendered by *hw* than by *wh*, or *h* followed by a vowel, thus *Hwang ho*, not *Whang ho*, or *Hoang ho*. | Hwang ho, Ngan hwei. |
| j | English *j*. *Dj* should never be put for this sound... ..... | Japan, Jinchuen. |
| k | English *k*. It should always be put for the hard *c*. Thus, not *Corea*, but | Korea. |
| kh | The Oriental guttural .. .... ..... .... ..... | Khan. |
| gh | is another guttural, as in the Turkish. .. . ..... | Dagh, Ghazi. |
| l, m, n | As in English. | |
| ng | has two separate sounds, the one hard as in the English word *finger*, the other as in *singer*. As these two sounds are rarely employed in the same locality, no attempt is made to distinguish between them. | |
| p | As in English. | |
| ph | As in *loophole*. | Chemulpho, Mokpho. |
| th | stands both for its sound in *thing*, and as in *this*. The former is most common. | Bethlehem. |
| q | should never be employed; *qu* (in *quiver*) is given as *kw* ..... . ... | Kwangtung. |
| | When *qu* has the sound of *k* as in *quoit*, it should be given by *k*. | |
| r, s, sh, t, v | As in English. | |
| w | ... ..... . ..... ..... ..... .... | Sawakin. |
| x | | |
| y | is always a consonant, as in *yard*, and therefore should never be used as a terminal, *i* or *e* being substituted as the sound may require. Thus, not *Mikindany*, but | Kikuyu. Mikindani. |
| | not *Kwaly*, but | Kwale. |
| z | English *z*..... ..... ..... ..... ..... | Zulu. |
| zh | The French *j*, or as *s* in *treasure* ..... ..... | Muzhdaha. |
| | Accents should not generally be used, but where there is a very decided emphatic syllable or stress, which affects the sound of the word, it should be marked by an *acute* accent. | Tongatábu, Pauáwon, Sárawak. |

# DECISIONS

In the following list of names, those approved by the Board are printed in black type. Names, and different forms of the same name, which have been discarded are also given; the former being printed in *italics* and alphabetically arranged with the adopted names, but the latter, when nearly like the adopted forms, are not repeated.

## A

**Abatagush**; bay, at the south end of Mistassini lake, Mistassini territory, Que.

*Abbika.* See Apika.

**Abbot**; mount, west of Duncan river, Kootenay district, B.C.

**Abbot**; pass, near mount Lefroy, Alta. and B.C.

**Abbott**; mount, south of Glacier station, Kootenay district, B.C.

**Abbott Corners**; village, Missisquoi county, Que. (Not Abbotts Corners.)

**Abenakis**; river, tributary to Etchemin R., Bellechasse Co., Que. (Not Abenaquis.)

**Aberdeen**; mount, northeast of mount Lefroy, Alta. (Not Hazel peak.)

**Abitibi**; territory, Que., also lake on boundary line between Ontario and Quebec, and river flowing from the lake to Moose river, Ont. (Not Abitibbi, Abittibi, nor Abittibbi.)

**Abloviak**; bay, east shore of Ungava bay, New Quebec. (Not Ablorialik.)

**Aboushagan**; river, Westmorland county,. N.B. (Not Abouchagan, Aboushogan, Aboushagin, nor Abougoggin.)

*Abraham.* See Abram.

**Abram**; lake, north of Minnitaki lake, Kenora district, Ont. (Not Abraham nor Abram's.)

**Acheninni**; lake, on Grassberry river, central Saskatchewan. (Not Blackfeet.)

**Achigan**; lake and river, tributary to L'Assomption river, Terrebonne county, Que. (Not L'Achigan.)

*Achigo.* See Sachigo.

**Active**; pass, between Galiano and Mayne islands, in the southern portion of the strait of Georgia, B.C. (Not Plumper's.)

**Acton Corners**; village, Grenville county, Ont. (Not Acton's Corners.)

**Actonvale**; town, Bagot county, Que. (Not Acton Vale.)

**Adam**; lake, west of Fluke lake, Kenora district, Ont.

**Adamant**; glacier, mountain, and range, Selkirk mountains, Kootenay district, B.C.

**Adams**; creek, branch of Bonanza creek, Klondike river, Yukon.

**Adams**; lake and river, emptying into the westerly end of Shuswap lake, Kamloops district, B.C.

**Adelaide**; island, northeast of Grenadier island, St. Lawrence R., Leeds county, Ont.

*Admiral.* See Saltspring.

**Admiralty**; group of islands, St. Lawrence R., south of Gananoque, Leeds Co., Ont.

**Adstock**; township and village, Frontenac county, Que.

**Advance**; reef, off Michael point, Manitoulin island, Manitoulin district, Ont.

**Affleck**; lake, northwest of Rosamond lake, Kenora district, Ont.

**Afton**; mount, south of mount Abbott, Selkirk mountains, Kootenay district, B.C.

**Agawa**; bay, islands, point and river, Algoma district, Ont. (Not Aguawa.)

**Agnes**; lake, west of lake Louise, Alta. (Not The Goat's Looking Glass.)

*Agotawekami.* See Duparquet.

*Aguawa.* See Agawa.

*A. H. Ward.* See Ward.

*Ahwillgate.* See Awillgate.

**Aiabewatik**; lake, east of Anzhekumming lake, Kenora district, Ont.

**Aigles** (lac et rivière des); lake and river, tributary to Mattawin river, St. Maurice county, Que. (Not Eagle.)

**Aiktow**; creek, flowing into the South Saskatchewan at 'The Elbow,' Sask.

**Ainslie**; shoal, south of Girouard point, Manitoulin island, Manitoulin district, Ont.

**Ainsworth**; town, west side of Kootenay lake, Kootenay district, B.C.

**Airy**; mount, east of mount Stanley, Kootenay district, B.C.

**Aishihik**; lake, and river tributary to the Dezadeash, southwestern Yukon.

**Aiskew**; island, northward of Frank point, western shore of Observatory inlet, Cassiar district, B.C.

**Akamina**; brook, tributary to Kishinena creek, near international boundary, Kootenay district, B.C., also pass, Alta. and B.C. (Not Akimina.)

*Akamina.* See Starvation.

**Akolkolex**; river, tributary to Columbia river, between Arrowhead and Revelstoke, Kootenay district, B.C. (Not Akotkolex.)

**Akos**; lake, at head of Kamachigama river, Montcalm county, Que. (Not Akonse nor Akoncy.)

*Akotkolex.* See Akolkolex.

**Akpatok**; island, Ungava bay, N.W.T.

*Akpatok.* See Aukpatuk.

**Akuinu**; river, tributary to Athabaska river, Alta. (Not A-kew-i-new.)

**Akuling**; inlet, north shore of Hudson strait, N.W.T. (Not A-ku-ling.)

**Akwatuk**; bay and river, south of Big river, New Quebec. (Not Aquatuk.)

**Albanel**; lake, east of Mistassini lake, Mistassini territory, Que. (Not Little Mistassini nor Mistassinis.) Mistassini lake and the lake called in recent years 'Little Mistassini' or 'Mistassinis,' were explored in 1672 by Père Charles Albanel, a Jesuit missionary, when on his way from L. St. John to Hudson bay *via* Rupert river. Père Albanel gave his name to the smaller lake and it is so named on the maps of Laure 1732, Bellin 1755, D'Anville 1755 and others from 1763 to 1794. In view of this evidence and the recommendation of the advisory member of the Board representing the province of Quebec, the previous decision has been revised.

**Albee**; lake, Montbeillard township, Timiskaming county, Que.

**Albert**; cañon, creek, glacier, peak and snowfield, east of Illecillewaet river, Kootenay district, B.C.

**Albert**; port, Huron county, Ont.

**Albert**; town, in Albert county, N.B. (Not Hopewell Corner.)

*Albert.* See Anderson.

**Alberta**; province, also Mt. Alberta north of Mt. Columbia, Rocky Mts., Alta.

**Albert Edward**; mount, east of Buttle lake, Vancouver island, B.C.

**Albury**; post village, Ameliasburg township, Prince Edward county, Ont.

**Alcott**; creek, flowing northeasterly into Chitek river, central Sask. (Not Rat.)

**Aldborough**; hamlet and township, Elgin county, Ont. (Not Aldboro.)

**Aldridge**; lake, west of Obowanga river, Thunder Bay district, Ont.

**Aldridge**; mount, west of Duncan river, Kootenay district, B.C.

*Alemek.* See Lamek.

**Alex**; river, flowing into L. St. John, Lake St. John county, Que.

**Alexander**; creek, tributary to Michel creek, Kootenay district, B.C. (Not North Fork of Michel creek.)

**Alexander**; railway station, slough, and village, Manitoba. (Not The Big slough.)

*Alexander.* See Marshall.

**Alexandra**; lake, Smellie township, Kenora district, Ont.

**Alexandra**; mount, west of Mt. Lyell, summit range of the Rockies, Alta., and Kootenay district, B.C.

**Alexis**; creek and lake, tributary to Chilcotin river, also Alexis Creek, post office, Cariboo district, B.C.

**Alford**; hamlet and railway station, Brant county, Ont. (Not Alford Junction.)

*Alford Junction.* See Alford.

**Algernon**; rock, in St. Lawrence river, southeast from 'Stone Pillar,' below Goose island, L'Islet county, Que. (Not Roche à Veillons nor South.)

**Alice**; lake, northeast of Bow lake, Alberta.

**Alki**; creek, tributary to Klondike river, Yukon.

**Allan**; lake, east of Wallace river, and river tributary to Saulteux river, central Alberta.

**Allan**; point, south of Dorval, Jacques Cartier county, Que. (Not Marion.)

**Allan Corners**; hamlet, Chateauguay county, Que. (Not Allan's Corners.)

**Allan Mills**; settlement, Lanark county, Ont. (Not Allan's Mills.)

**Allanwater**; river, emptying into Wabakimi lake, Thunder Bay district, Ont.

**Allard**; river, emptying into Mattagami lake, Abitibi territory, Que. (Not Mattagami.)

**Allen**; island, west of Beckman peninsula, N.W.T.

**Allgold**; creek, tributary to Klondike river, Yukon.

**Alligator**; lake and mountain, north of Watson river, southern Yukon.

**Allison**; creek, flowing into Similkameen river, below Princeton, Similkameen district, B.C. (Not Graveyard nor One Mile.)

**Allumette**; lake, an expansion of Ottawa river, Renfrew county, Ont. (Not Pembroke.)

*Allumette.* See Chalk.

**Alma**; creek, tributary to Klondike river, Yukon.

**Alouette**; lake and river, tributary to Pitt river, New Westminster district, B.C. (Not Lillooet.) To avoid confusion with the larger lake and river emptying into Harrison lake in same district.

**Alouettes** (pointe aux); point, at southern entrance to Saguenay river, Saguenay county, Que. (Not Lark point nor Pte. Aux Alouette.)

**Alsek**; river, formed by the junction of the Dezadeash and Kaskawulsh, Cassiar district, B.C., and Yukon. (Not Alseck nor Altsek.)

**Altrude**; creek, flowing from a group of small lakes of same name, near Vermilion pass, to Bow river, west of Castle station, Alta. (Not Little Vermilion.)

**Alukpaluk**; bay, southeast shore of Ungava bay, New Quebec.

**Alwin**; rock, west of Bigsby island, at entrance to Key harbour, Georgian bay, Parry Sound district, Ont.

*Amazon.* See Milton.

*Ambella.* See Arabella.

**Ameliasburg**; township, Prince Edward county, Ont. (Not Ameliasburgh.)

**Amherst**; island, in lake Ontario, Lennox county, Ont.

**Amik**; lake, south of Minnitaki lake, Kenora district, Ont.

*Amikitik.* See La Sarre.

**Amiskwi**; peak, at headwaters of Amiskwi river, Rocky mountains, Kootenay district, B.C.

**Amiskwi**; river, tributary to Kicking Horse river, Kootenay district, B.C. (Not Beavertail nor North Branch of Kicking Horse river.)

**Ammerman**; mountain, a spur of Davidson mountains, international boundary, Alaska and Yukon.

**Amos**; village, Figuery township, Timiskaming county, Que.

**Amy**; point, at north end of Gribbell island, Coast district, B.C.

*Anaham.* See Anahim.

**Anahim**; creek, tributary to Chilcotin river, also lake and Indian reserve, Cariboo district, B.C. (Not Anaham.)

**Anamebini**; river, tributary to Severn R., Patricia district, Ont. (Not Anamabine.)

**Anderson**; channel, east of Beekman peninsula, N.W.T.

**Anderson**; lake, southwest of Seton lake, Lillooet district, B.C.

**Anderson**; mount, south of Wheaton river, southern Yukon.

**Anderson**; point N.E. entrance to Washow bay, L. Winnipeg, Man. (Not Albert.)

**Anderson**; point, Lansdowne township, Leeds county, Ont. (Not Horse Block.)

*Anderson.* See Henderson.

**Anderson Corners**; settlement, Huntingdon county, Que. (Not Anderson's Corners.)

**Anerley**; lake, Tp. 28, Rges. 9 and 10, W. 3 M., Sask. (Not Red Deer.)

*Anesty.* See Anstey.

*Ange Gardien de Rouville.* See Canrobert.

**Angle**; mountain, in the angle formed by the Seymour arm of Shuswap lake, Kamloops district, B.C.

*Angle peak.* See The Vice-President.

**Ann**; point, Upper Arrow lake, Kootenay district, B.C. (Not Lone Tree.)

**Anne**; point, opposite Massasauga point, Hastings county, Ont.

**Annette**; lake, north of mount Temple, Alta.

**Annie**; lake, north of the 'big bend' of Wheaton river, southern Yukon.

**Annimwash**; bay, in lake St. Joseph, and lake north of lake St. Joseph, Patricia district, Ont.

**Anse-à-Beaufils**; post settlement, Gaspe county, Que. (Not L'Anse au Beaufils.)

**Anse-au-Vallon**; village, Gaspe county, Que. (Not L'Anse-à-Valleau.)

**Anstey**; arm (Shuswap lake), creek, lake, and river, Kamloops district, B.C. (Not Anesty.)

**Anstey**; mount, Selkirk range, Kootenay district, B.C.

**Anstruther**; lake and township, Peterborough county, Ont. (Not Eagle.)

*Ant.* See Deacon.

**Anticline**; mountain, between headwaters of Nordenskiöld R. and L. Laberge, Yukon.

*Antikamisk.* See Salone.

**Antler**; river, tributary to Souris river, southern Man. and Sask. (Not South Antler.)

**Antonio**; point, southerly extremity of Maurelle island, Coast district, B.C.

**Anuk**; river, tributary to Stikine river, Cassiar district, B.C.

**Anvil**; mountain, between Cottonwood and Dease rivers, Cassiar district, B.C.

**Anwatan**; lake, east of Grand lake Victoria, Pontiac county, Que.

**Anzhekumming**; lake, northeast of Manitou lake, Kenora district, Ont. (Not Upper Manitou.)

**Apeganau**; river, tributary to Burntwood river, Manitoba. (Not Muddy Water.)

**Apika**; brook, flowing into head of lake Timiskaming, Que. (Not Abbika.)

**Apussigamasi**; lake, on Burntwood river, Manitoba. (Not Appussigamahsin.)

*Aquatuk.* See Akwatuk.

**Arabella**; island, south of Francis island, between Grindstone and Wolfe islands, St. Lawrence river, Frontenac county, Ont. (Not Ambella.)

**Arbutus**; rock, south of cape Hurd, Bruce county, Ont.

*Arbutus.* See Saddle.

**Arcand**; bay, in Ottawa river, west of Montebello, Labelle county, Que. (Not Arcans, Cardinal's nor Charlebois.)

*Arcans.* See Arcand.

**Archibald**; bay, north shore of Hudson strait, N.W.T.

**Arcola**; lake, Tp. 10, R. 3, W. 2 M., Sask. (Not Fish.)

**Arcs** (lac des); lake, expansion of Bow river, Rocky Mountains park, Alberta.

*Ardoise.* See L'Ardoise.

**Argentine**; mountain and glaciers, between north and south branches of Gold river, Selkirk mountains, Kootenay district, B.C.

**Argonaut**; mountain, between heads of Bigmouth and French creeks, Selkirk mountains, Kootenay district, B.C.

**Argyle**; creek, tributary to St. Mary river, Kootenay district, B.C.

**Argyle**; islands, northwest of Burke island, Bruce county, Ont.

*Arignole.* See Orignal.

**Arkansas**; creek, tributary to Dominion creek, Indian river, Yukon.

*Ark-e-leenik.* See Thelon.

*Arkell.* See Kusawa.

**Arlington**; lakes and mountain, west of Westkettle river, Similkameen district, B.C.

**Arm**; islands, Southgate group, Queen Charlotte sound, Coast district, B.C.

**Arm**; river, flowing into the southern portion of Last Mountain lake, southern Sask.

**Armit**; river, flowing into Red Deer lake, Man. and Sask. (Not Armitt.)

*Armitt.* See Armit.

**Armstrong**; lake, Redditt township, Kenora district, Ont.

*Armstrong*. See Downey.

**Arnet**; island, southwest of Stone island, Clayoquot sound, Vancouver island, B.C.

**Aroma**; lake, northeast of Tramping lake, Sask.

**Aroostook**; river, tributary to St. John river, Victoria county, N.B. (Not Arostook.)

**Arosen**; island, in Ottawa river, west of Montebello, Labelle county, Que. (Not Arouson, Rousseau nor Roussin.)

**Arrow**; lake and river, tributary to Pigeon river, Thunder Bay district, Ont.

**Arrowpark**; creek, tributary to Columbia river, Kootenay district, B.C. (Not Mosquito.) Previous decision revised.

**Arrowsmith**; mount, southeast of Alberni, Vancouver island, B.C.

*Arrowwood*. See Rosebud.

**Arthuret**; village, Victoria county, N.B. (Not Arthurette.)

Arthur land. See Ellesmere.

**Arthur Seat**; mountain, near Nahlin river, Cassiar district, B.C. (Not Arthur's.)

*Arva*. See Medway.

*Asapikona*. See Faucher.

**Ascot**; village, Sherbrooke county, Que. (Not Ascot Corner.)

**Ash**; brook, northeast of Nozheiatik lake, Kenora district, Ont.

**Ash**; lake, Redditt township, Kenora district, Ont.

*Ash*. See Lynedoch.

**Asham**; point, southwest of Peonan point, lake Manitoba, Man.

**Ashby**; lake and township, Addington county, Ont. (Not Island lake.)

**Ashe**; lake, northeast of Blaine lake, central Saskatchewan.

**Ashe**; inlet, south shore of Big island, Hudson strait, N.W.T.

**Asheigamo**; lake, S. of L. Hill, Kenora district, Ont. (Not Bass nor Tasheigama.)

**Asheweig**; river, tributary to Winisk river, Patricia district, Ont. (Not West Winisk.)

**Ashnola**; river, tributary to Similkameen river, southern B.C. (Not Ashnoulou.)

**Ashton**; point, Douglas channel, opposite Maitland island, Coast district, B.C.

**Ashuapmuchuan**; lake and river, Lake St. John county, Que.

**Asinitchibastat**; lake, west of Chibougamau lake, Abitibi territory, Que. (Not Asinitebastat.)

*Asipimocasi*. See Magusi.

**Asippitti**; river, tributary to Burntwood river, Manitoba.

*Askikwaj*. See LaMotte.

**Askitichi**; lake, headwaters of Ashuapmuchuan river, Chicoutimi county, Que.

*Askow*. See Bow.

*Askwahani*. See Eskwahani.

**Aspasia**; island, southwest of Grenadier island, St. Lawrence R., Leeds county, Ont.

*Aspatagoen*. See Aspotogan.

**Aspotogan**; harbour, mountain, peninsula and hamlet, Lunenburg county, N.S. (Not Aspatageon.)

**Aspy**; bay and river, Victoria county, N.S. (Not Aspee.)

**Assiniboine**; mount, Alta. and Kootenay district, B.C.

**Assiniboine**; pass, northeast of Mt. Assiniboine, Rocky mountains, Alberta, and Kootenay district, B.C.

**Assinika**; lake, discharging into the upper Broadback river, Abitibi territory, Que.

**Assinkepatakiso**; lake, near Atikwa lake, Kenora district Ont.

**Assiwanan**; lake, at headwaters of St. Maurice river, Champlain county, Que. (Not Asiwawanan.)

**Astounder**; island, southwest of Axeman island, Lake Fleet group, St. Lawrence river, Leeds county, Ont.

**Asulkan**; brook, falls, glacier, pass, and ridge, Selkirk Mts., Kootenay district, B.C.

*Atem.* See Atim.

**Athabaska**; lake, Alberta and Saskatchewan. (Not Athabasca.)

**Athabaska**; mount, at headwaters of Sunwapta river, also glacier, Rocky mountains, Alberta. (Not Athabasca.)

**Athabaska**; pass, at headwaters of Whirlpool river, Alberta, and Cariboo district, B.C. (Not Athabasca.)

**Athabaska**; river, Alberta. (Not Athabasca.)

**Athabaska**; town, on Athabaska river, central Alberta. (Not Athabaska Landing.) Previous decision revised.

**Athalmer**; town, on Columbia river below its outlet from Windermere lake, Kootenay district, B.C. (Not Athelmer.)

**Athapapuskow**; lake, west of Cranberry lake, Manitoba. (Not Athapuscow.)

**Athol**; bay, Athol township, Prince Edward county, Ont. (Not Little Sandy.)

*Atic-a-make.* See Atikameg.

**Atik**; river, tributary to Migiskan river, below Millie lake, Pontiac county, Que. (Not Atikosipi.)

**Atikameg**; lake, western Manitoba. (Not Atic-a-make.)

*Atikamek.* See Lamy.

**Atikkamek**; creek, tributary to Iosegun river, Alberta. (Not Atikkamey.)

*Atikmahik.* See Beaudry.

**Atikonak**; lake and river, near height of land, south of Hamilton river, Ashuanipi territory, Que. (Not Attikonak.)

*Atikosipi.* See Atik.

**Atikwa**; lake, southeast of Dryberry lake, Kenora district, Ont. (Not Deer.)

**Atim**; river, flowing into Manuan lake, upper St. Lawrence river, Champlain county, Que. (Not Atem.)

**Atlin**; lake, Cassiar district, B.C. and Yukon.

**Atlin**; mining division and mountain, Cassiar district, B.C.

*Atocas.* See Azatika.

**Attawapiskat**; lake and river, emptying into James bay, Patricia district, Ont. (Not At-tah-wha-pis-kat nor Attawapiscat.)

*Attikonak.* See Atikonak.

*Attim Segoun.* See Iosegun.

**Attitti**; lake, south of Churchill river and east of Pelican narrows, Sask.

**Aubrey**; island, Admiralty group, St. Lawrence river, Leeds county, Ont. (Not Burnt, Dark nor Smoke.)

**Augustine**; peak, in the Bishops range of the Selkirks, Kootenay district, B.C.

**Aukpatuk**; fishing station, west coast of Ungava bay, New Quebec. (Not Akpatok.)

**Aulac**; river, emptying into Cumberland bay, Westmorland county, N.B. (Not Au Lac nor Oulac.)

*Aulnes.* See Auneuse.

**Auneuse** (rivière); river, tributary to St. Lawrence river, Lévis county, Que. (Not Aulnes, Gaspé, Grillage, Neux, Noeds, Vicontent, nor Vitcontent.)

**Ausable**; river, south of Goderich, Huron county, Ont. (Not aux Sables nor Sable.)

**Austerity**; glacier and mountain, Adamant range, Selkirk mountains, Kootenay district, B.C.

**Austin**; lake, Melick township, Kenora district, Ont.

**Australia**; creek, tributary to Indian river, Yukon.

*Autaca.* See Azatika.

**Ava**; inlet, north shore of Hudson strait, N.W.T.

**Avalanche**; creek, glacier, and mountain, Selkirk mountains, Kootenay district, B.C.

**Avens**; mount, east of Protection mountain, Rocky mountains, Alta.

**Awillgate**; Indian village, also peak, east of Hazelton, Cassiar district, B.C. (Not Ahwillgate.)

**Axel Heiberg**; island, west of Ellesmere island, N.W.T.

**Axeman**; island, Lake Fleet group, St. Lawrence river, Leeds county, Ont.

**Aye**; mount, south of Mt. Assiniboine, Rocky mountains, Alberta, and Kootenay district, B.C.

**Ayesha**; peak, north of mount Collie, Rocky mountains, Kootenay district, B.C.

**Aylen**; lake, Dickens township, Nipissing district, Ont. (Not Little Opeongo.)

**Aylmer**; mount, also cañon, north of Minnewanka lake, Rocky Mts. park, Alta.

**Aylmer**; lake, Wolfe county, Que.

**Aylmer**; town, Ottawa county, Que. (Not Aylmer East.)

**Aylmer**; town, Elgin county, Ont.

**Aylmer**; township, Frontenac county, Que.

**Azatika**; bay and brook, Prescott county, Ont. (Not Atocas, Autaca, Dez Amecane nor Deseticaux.)

**Azimuth**; mountain and peak, north of mount Sir Sandford, Selkirk mountains, Kootenay district, B.C.

## B

*Babb.* See Bobb.

**Babine**; mountain range, lake, and river tributary to Skeena river, Cassiar and Coast districts, B.C.

**Bach**; mount, near Hutshi lakes, southwestern Yukon.

*Bachewanaung.* See Batchawana.

*Back.* See Prairies.

**Backs**; river, flowing northeasterly into the Arctic ocean, N.W.T. (Not Thleweechodezeth nor Great Fish.)

*Back's Western.* See Western.

**Bacon**; cove and point, on north side of Prince Rupert harbour, Coast district, B.C.

**Bacon**; rock, west of Ridley island, S.E. of entrance to Prince Rupert harbour, B.C.

*Bacon.* See Vigilant.

*Bad.* See Bull.

**Badesdawa**; lake, north of L. St. Joseph, Patricia district, Ont.

**Bad Neighbour**; rock in main channel entrance to Georgian bay, Bruce Co., Ont.

*Bad Rice.* See Kaiashkomin.

**Badshot**; mountain, west of Duncan river, Kootenay district, B.C.

*Bad Throat.* See Manigotagan.

**Baffin**; island, N.W.T. (Not Baffin Land.)

**Bagheera**; mountain, Hermit range of the Selkirks, Kootenay district, B.C.

**Bagot**; island, northeast of Grenadier island, St. Lawrence river, Leeds county, Ont. (Not Narrow nor Rattlesnake.)

*Bagutchuan.* See Pagwachuan.

*Bagwah.* See Lonely.

*Baie des Chaleurs.* See Chaleur bay.

*Baie des Ha Ha.* See Ha Ha.

**Baie-St. Paul**; town, Charlevoix county, Que. (Not St. Paul's Bay.)

**Baie-Verte**; village, Westmorland county, N.B. (Not Bay Verte.)

**Bailey**; lake, south of L. Seul, Kenora district, Ont. (Not Edith.)

**Baillargeon**; post office, Lévis county, Que. (Not St. Etienne.)

**Bain**; brook, tributary to Incomappleux river, Kootenay district, B.C.

**Bain**; rock, in middle of channel between Great and Outer Duck islands, Manitoulin district, Ont.

**Bakado**; lake, south of Separation lake, Kenora district, Ont.

**Baker**; creek and lake, north of Eldon station, Rocky mountains, Alta.

**Baker**; creek, tributary to Yukon river, south of Klondike river, Yukon.

**Baker**; island, between Nigger island and Trenton, Hastings county, Ont.

**Baker**; mount, south of Howse pass, Rocky mountains, B.C.

**Balache**; point, in the strait of Canso, Inverness county, N.S. (Not Belache, Belhache, McMillan nor Plaster Cove point.)

**Bald**; creek, headwaters of Klondike river, Yukon.

**Bald**; head, at entrance to Weller bay, Prince Edward county, Ont.

**Bald**; island, in Weller bay, Ameliasburg township, Prince Edward county, Ont.

**Bald**; mountain, east of Sir Donald range of the Selkirks, Kootenay district, B.C.

**Bald Eagle**; lake, an expansion of Grass river, Manitoba.

**Baldur**; mount, west of Upper Arrow lake, Kootenay district, B.C.

*Baldwin's.* See Lyster.

**Balfour**; mount, also glacier and pass, Rocky mountains, Alta. and B.C.

**Ball**; lake, an expansion of English river, Kenora district, Ont.

**Ballantyne**; bay and river, Deschambault lake, central Saskatchewan.

**Ballenas**; channel and island, strait of Georgia, New Westminster district, B.C (Not Ballinac.)

*Ballinac.* See Ballenas.

**Balne**; lake, south of Silver lake, Kenora district, Ont.

*Baltimore.* See Irving.

**Bamaji**; lake, Cat river, west of L. St. Joseph, Patricia district, Ont. (Not Bamajigma nor Cross.)

**Banfield**; creek, emptying into Barkley sound, Vancouver I., B.C. (Not Bamfield.)
**Banks**; island N.W. of Victoria I., N.W.T. (Not Bank's Land, nor Baring Land.)
**Banner**; hamlet, Oxford North township, Oxford county, Ont.
**Bannock**; burn, tributary to Little Slocan R., Kootenay, B.C. (Not Bannock creek.)
**Bannock**; point, at north end of Upper Arrow lake, Kootenay district, B.C.
**Baptist**; harbour, lake and rock, southeast of cape Hurd, Bruce county, Ont.
**Baptiste**; lake, Herschel township, Hastings county, Ont. (Not Kaijick Manitou.)
**Baptiste**; river, tributary to the North Saskatchewan, central Alberta.
**Barbara**; lake, southeast of L. Nipigon, Thunder Bay district, Ont. (Not Gull.)
**Barber**; lake, in McGarry township, Timiskaming district, Ont.
**Barbue**; post office, Rouville county, Que. (Not Barbue de St. Césaire.)
*Barbue de St. Césaire.* See Barbue.
**Barclay**; railway station, Kenora district, Ont.
*Barclay.* See Barkley.
**Barge**; island, Lake Fleet group, St. Lawrence river, Leeds county, Ont.
**Barham**; mount, west of Surprise lake, Cassiar district, B.C.
*Baring.* See Banks.
**Bark**; lake, Jones township, Renfrew county, Ont.
**Barkley**; sound, west coast of Vancouver island, B.C. (Not Barclay.)
**Barnaby**; railway station, river, and village, Northumberland county, N.B. (Not Barnaby River P.O.)
**Barnard**; lake, northwest of Sturgeon lake, Thunder Bay district, Ont.
**Barnes**; bay, north shore of Okisollo channel, Coast district, B.C.
**Barnes**; creek, tributary to Whatshan river, Kootenay district, B.C.
**Barney**; river, Pictou county, N.S. (Not Barney's.)
**Barney River**; hamlet, Pictou county, N.S. (Not Barney's River.)
**Barnston**; lake, English river, Kenora district, Ont.
*Barnston.* See Lyster.
*Barrel.* See Keg.
**Barren**; brook, south of Eagle lake, Kenora district, Ont.
**Barrès**; lake, Quebec county, Que. (Not Little Metascouac.)
**Barrett**; bay, Wolfe island, Frontenac county, Ont. (Not Ferguson.)
**Barrett**; ledges, east side of Brandypot channel, St. Lawrence river, Temiscouata county, Que.
**Barrett**; reef, southeast of Milton bank, Bruce county, Ont.
**Barrett**; rock, east of entrance to Prince Rupert harbour, Coast district, B.C.
**Barrette**; lake, Methuen township, Peterborough county, Ont.
**Barrie**; beach, east entrance of Halifax harbour, Halifax Co., N.S. (Not Stony.)
**Barrie**; lake, Redditt township, Kenora district, Ont.
**Barrière**; lake, an expansion of the upper Ottawa river, Pontiac county, Que.
**Barrington**; lake, northwest of Kawaweogama lake, Thunder Bay district, Ont.
**Barrington Passage**; village, on the west side of Barrington bay, at the narrows, Shelburne county, N.S. (Not West Passage.)
**Barrington**; town, on the east side of Barrington bay, near its head, Shelburne county, N.S.

**Barron**; river, tributary to Petawawa river, Renfrew county, Ont. (Not South Branch of Petawawa nor South Petawawa.)

**Bartibog**; post office and river, Gloucester county, N.B. (Not Bartibogue.)

**Barwell**; mount, between the upper waters of Fisher creek and Sheep river, Alta.

**Basin**; lake, northwest of Lenore lake, central Saskatchewan.

*Basin of Mines.* See Minas basin.

**Baskatong**; lake, river, township and village, Ottawa county, Que.

**Basket**; lake, south of Minnitaki lake, Kenora district, Ont.

*Bason.* See Bouleau.

*Basquia.* See Pasquia.

**Bass**; islands (3), Admiralty group, St. Lawrence river, Leeds county, Ont. (Not Seven Pines.)

*Bass.* See Asheigamo.

*Bass.* See Cassidy.

*Bass.* See Jacob.

**Basswood**; lake, Int. boundary, Rainy River district, Ont. (Not Whitewood.)

**Bastion**; island, in southern portion of Atlin lake, Cassiar district, B.C.

**Bastion**; mountains, north of Salmon arm (Shuswap L.), Kamloops district, B.C.

**Batchawana**; bay, island, river, and village, Algoma district, Ont. (Not Bachewanaung nor Batchewana.)

**Bath**; creek and glacier, near Stephen station, Alta. (Not Noores.)

*Bathing.* See Royal.

**Bathurst**; island, east of Melville island, N.W.T.

*Bathurst.* See Grenadier.

**Battersby**; island, Brock group, St. Lawrence R., Leeds Co., Ont. (Not Burntstone.)

**Battle**; brook, tributary to Incomappleux river, Kootenay district, B.C.

**Battle**; lake, on Battle river, Alberta. (Not Battle River lake.)

**Battle**; mountain, west of Alexis creek, Cariboo district, B.C.

**Battle**; river, flowing into the North Saskatchewan at Battleford, Alta. and Sask.

**Battleford**; town, central Saskatchewan.

**Baudet**; river, Glengarry county, Ont., also post village and river, Soulanges county, Que. (Not Beaudet, Bôdet, Rivière Beaudette nor River Beaudette.)

**Baumgardt**; island, at entrance to Landon bay, St. Lawrence river, Leeds county, Ont.

**Baxter**; river, emptying into Waswanipi lake, Abitibi territory, Que.

**Baxter Harbour**; hamlet, Kings county, N.S. (Not Baxter's Harbour.)

**Bayfield**; bay, Wolfe island, Frontenac county, Ont. (Not Big.)

**Bayfield**; island, at entrance to Bayfield bay, Wolfe island, Frontenac county, Ont. (Not Mud.)

**Bayfield**; river and town, Huron county, Ont.

**Bayfield**; shoal, west of Abrahamhead, east of Kingston, Frontenac county, Ont. (Not Bolivia.)

*Bay Ha Ha.* See Ha Ha.

**Bayley**; bay, eastern extreme of Basswood lake, international boundary, Rainy River district, Ont.

*Baynes.* See Maxwell.

**Bays**; lake of, Ridout township, Muskoka district, Ont.

**Bayside**; post village, Sidney township, Hastings county, Ont.

*Bay Verte.* See Baie-Verte.

**Bazan**; bay, north of Cordova channel, Vancouver island, B.C.

*Beacon.* See Inukshuktuyuk.

**Beady**; creek, near outlet of Dease lake, Cassiar district, B.C.

**Beament**; island, southeast of Cavalier island, Bruce county, Ont.

**Bear**; creek, tributary to Klondike river, Yukon.

**Bear**; river, Annapolis and Digby counties, also Bear River post office, Digby county, N.S. (Not Hébert.)

**Bear**; river, flowing into the upper end of Portland canal, Cassiar district, B.C.

*Bear.* See Bowron.

*Bear.* See Cockle.

*Bear.* See Darlens.

*Bear.* See Great Bear.

*Bear.* See Lorrain.

*Bear.* See Mansfield.

*Bear.* See Maskwa.

*Bear.* See Morin.

*Bear.* See Mistaya.

*Bear.* See Suskwa.

*Bear.* See Wapawekka.

**Bearbrook**; hamlet, Russell county, Ont. (Not Bear Brook.)

**Beardwood**; lake, Brudenell township, Renfrew county, Ont.

**Bear-grease**; river, upper Ottawa river, near O'Sullivan lake, Montcalm county, Que.

*Bear Lake river.* See Deschambault.

**Beaton**; mount, on boundary line, in great bend of Tatshenshini river, Cassiar district, B.C. and Yukon.

**Beatrice**; cape, E. side of Lower Arrow L., Kootenay district, B.C. (Not cape Horn.)

**Beatrice**; lake, west of Slocan lake, Kootenay district, B.C.

**Beatty**; point, in upper portion of Prince Rupert harbour, Coast district, B.C.

**Beaubien**; lake, east of Silver lake, Kenora district, Ont.

**Beauchamp**; lake, Figuery, Trécesson and Villemontel townships, Timiskaming county, Que. (Not Spirit.)

*Beaudet.* See Baudet.

**Beaudry**; lake, Beaumesnil township, Timiskaming county, Que. (Not Atikmahik.) Previous decision revised.

**Beaufils** (anse à); bay, Percé township, Gaspe county, Que. (Not Bonfils.)

**Beaumont**; harbour, north shore of Hudson strait, N.W.T.

**Beaupré**; creek, tributary to Bow river, Alberta.

**Beaurivage**; island, Admiralty group, St. Lawrence river, Leeds county, Ont. (Not Buck's.)

**Beaver**; creek, crossing the international boundary and flowing northeasterly to White river, Yukon.

**Beaver**; glacier, mountain, and river, Selkirk mountains, Kootenay district, B.C.

**Beaver**; lake, south of Atlin lake, Cassiar district, B.C.

**Beaver**; river, tributary to Churchill river, central Alberta and Saskatchewan.

*Beaver.* See Beaverdell.

*Beaver.* See Beaverhill.

*Beaver.* See McFarlane.

*Beaverdam.* See Castor.

*Beaver-dam.* See Wuskwatim.

**Beaverdell**; creek, tributary to Westkettle river, also village, Similkameen district, B.C. (Not Beaver creek.)

**Beaverfoot**; range of mountains and river, near Leanchoil sta., Kootenay dist., B.C.

**Beaverhill**; creek and lake, east of Edmonton, Alberta. (Not Beaver.)

**Beaverhouse**; lake, McVittie township, Timiskaming district, Ont.

**Beaverhouse**; lake, southwest of Eagle lake, Kenora district, Ont.

**Beaverlodge**; river, tributary to Wapiti river, west of Grande Prairie, Alberta. (Not Beaver Lodge.)

*Beavertail.* See Amiskwi.

**Becaguimec**; lake and river, Carleton and York counties, N.B. (Not Beccaguimec nor Peckagomique.)

**Bécancour**; lake, Thetford township, Megantic county, Que.

**Becher**; bay, southern coast of Vancouver island, B.C. (Not Beecher.)

**Beck**; island, west of Stone island, Clayoquot sound, Vancouver island, B.C.

**Becker**; creek, tributary to Wheaton river, southern Yukon.

**Beckington**; lake, southeast of Harris lake, Thunder Bay district, Ont.

**Becroft**; point, at south entrance to Weller bay, Prince Edward county, Ont.

*Beddingfield.* See Malahat.

**Bedford**; harbour, north shore of Hudson strait, N.W.T.

**Bedlington**; railway station, Int. boundary, Kootenay district, B.C. (Not Rykerts.)

**Bedrock**; creek, tributary to Sixtymile river, Yukon.

**Bee**; peak, east of Taku arm, Cassiar district, B.C.

**Beech**; point, Fitzwilliam island, Manitoulin district, Ont.

*Beecher.* See Becher.

**Beech Hill**; post office, Albert county, N.B.

**Beechridge**; post village, Argenteuil county, Que. (Not Beech Ridge.)

**Beechwood**; village and railway station, Carleton county, N.B. (Not Bumfrau.)

**Beechy**; head, southern coast of Vancouver island, B.C.

*Beeghados.* See Pachena.

**Beekman**; peninsula, south of entrance to Cumberland sound, N.W.T.

**Begbie**; mount, southwest of Revelstoke, Kootenay district, B.C.

**Behrman**; creek, flowing westerly into Howser creek, Kootenay district, B.C. (Not Clear.)

**Belabourer**; island, Lake Fleet group, St. Lawrence river, Leeds county, Ont.

*Belache.* See Balache.

*Bela Kula.* See Bellakula.

**Bélanger**; bay and point, near Girouard point, Manitoulin district, Ont. (Not West Belanger.)

**Bélanger**; hamlet, Laval county, Que. (Not Village Bélanger.)

**Bélanger**; river, flowing into L. Winnipeg, Manitoba. (Not Black nor Little Black.)

*Belas.* See Lepreau.

**Belcher**; mount, Saltspring island, southeast coast of Vancouver island, B.C.

**Belcher**; reef, extending north from MacGregor point, Bruce county, Ont.

*Belhache.* See Balache.

**Bell**; mount, south of Wheaton river, southern Yukon.

**Bell**; river, flowing from the height of land near Grand lake Victoria and emptying into Mattagami lake, Abitibi and Timiskaming, Que.

**Bellabella**; settlement, on Campbell island, Coast district, B.C. (Not Bella Bella.)

**Bellakula**; river and settlement, Coast district, B.C. (Not Bela Kula nor Bella Coola.)

**Bellefeuille**; river, flowing from Robertson lakes to Makamik lake, Timiskaming county, Que. (Not Kakameonan.)

**Belle-Vallée**; village, St. Johns county, Que. (Not Belle Vallée nor Bellevalle.)

**Belliveau**; cove and village, Digby county, N.S. (Not Belliveau Cove village nor Belliveaux Cove village.)

**Belliveau**; creek, tributary to Petitcodiac river, Westmorland county, N.B. (Not Belle Vue nor Boyd.)

**Belliveau**; village, Westmorland county, N.B. (Not Beliveau.)

**Bellmay**; village, Leeds county, Ont. (Not Bellmay's.)

**Bells Corners**; village and Ry. station, Carleton Co., Ont. (Not Bell's Corners.)

*Belly.* See Mokowan.

**Belmina**; village, Wolfestown township, Wolfe county, Que.

*Belœil.* See St. Hilaire.

**Bending**; lake, at head of Big Turtle river, Kenora district, Ont.

**Bendor**; mountains, between Cadwallader and McGillivray creeks and Bridge river, Lillooet district, B.C. (Not Bend'or nor Lorne.)

**Bennett**; lake, B.C. and Yukon.

**Bennett**; mount, northwest of Stupart bay, Hudson strait, New Quebec.

**Benson**; creek, tributary to the north fork of Klondike river, Yukon.

**Benson**; lake, in Skead township, Timiskaming district, Ont.

**Benson**; mount, west of Nanaimo, Vancouver island, B.C.

**Benson**; point, South bay, Manitoulin island, Manitoulin district, Ont.

**Bent**; lake, east of Tawatinaw lake, Kenora district, Ont.

**Bentinck**; island, south of Pedder bay, Vancouver island, B.C.

**Berens**; H. B. Co.'s post, also island and river, E. of L. Winnipeg, Man. (Not Beren's.)

**Bergeronnes**; parish, in Bergeronnes township, Saguenay county, Que. (Not Les Bergeronnes.)

**Bergheim**; settlement, in Tp. 37, R. 3, W. 3 M., Sask.

**Bern**; creek, tributary to Black river, international boundary, Yukon.

**Bernard**; lake, south of Bennett lake, Cassiar district, B.C.

**Berney**; creek, tributary to Wheaton river, southern Yukon.

**Berry**; lake, north of Lobstick bay, Kenora district, Ont.

**Berrys Mills**; village, Westmorland county, N.B. (Not Berry's Mills.)

**Bersimis**; point, river, and village, Saguenay county, Que. (Not Betsiamits.)

*Best.* See Hatton.

*Betsiamits.* See Bersimis.

**Biart**; lake, Biart township, Quebec county, Que. (Not Kamilikamac.)

**Biddle**; mount, south of mount Lefroy, Rocky mountains, Kootenay district, B.C.

**Biddle**; pass, between Mt. Biddle and Park mountain, Yoho park, Rocky mts., B.C.

**Bident**; mountain, east of mount Fay, Rocky mountains, Kootenay district, B.C.

**Big**; bay and island, in the bay of Quinte, Prince Edward county, Ont. Big Island post office is on the north side of the island.

*Big.* See Bayfield.

*Big.* See Black.

*Big.* See Dumoine.

*Big.* See Edgett.

*Big.* See Hecla.

*Big.* See Koksoak.

*Big.* See Merigomish.

*Big.* See Skelton.

*Big.* See Wilton.

*Big Black.* See Hecla.

*Big Cutarm.* See Cutarm.

*Big Egg.* See Missawawi.

**Bigelow**; island, Weller bay, Prince Edward county, Ont.

**Bighill**; creek, tributary to Bow river, Alta.

**Bighorn**; mountain range, extending from Brazeau river to the North Saskatchewan, also river tributary to the North Saskatchewan, Alta. (Not Big Horn nor Big-horn.)

**Big Knife**; portage, between Seed and Melon lakes, international boundary, Rainy River district, Ont.

*Big Loran.* See Lorembec.

*Big Lorraine.* See Lorembec.

*Big (or North) Miminigash.* See Miminegash.

*Big Obashing.* See Obashing.

**Big Otter**; creek, flowing into lake Erie, Elgin county, Ont. (Not Otter.)

*Big Otter Creek (lightstation)* See Port Burwell.

*Big Port l'Hebert.* See Port Hebert.

*Big Quill.* See Quill.

*Big Reed.* See Kiskittogisu.

*Big Rock.* See Inukshiligaluk.

*Big Rouge creek.* See Rouge river.

*Big Saanich.* See Wark.

**Big Salmon**; river, tributary to Lewes river, Yukon.

*Big Sandy.* See Wellington.

**Bigsby**; island, at entrance to Key harbour, Georgian bay, Parry Sound district, Ont.

*Big Stave.* See Stave.

*Big Sturgeon.* See Torch.

**Big Thrumcap**; island at entrance to Halifax harbour, Halifax county, N.S.

**Billtown**; settlement, Kings county, N.S. (Not Bill Town.)

**Binbrook**: township and village, Wentworth county, Ontario. (Not Binbrooke.)

**Bingay**; creek, tributary to Elk river, Kootenay district, B.C.

**Bingham**; island, southwest of Lynedoch island, St. Lawrence river, Leeds county, Ont. (Not Binghan.)

**Birch**; brook and lake, Burntwood river, Manitoba.

**Birch**; lake, between Basswood and Carp lakes, international boundary, Rainy River district, Ont.

**Birch**; point, east of Walker point, Manitoulin district, Ont.

*Birch.* See Dozois.

*Birch.* See Evelyn.

*Birch.* See Wigwasikak.

**Birchbark**; lake, south of Candle lake, central Saskatchewan. (Not Birch Bark.)

**Bird**; creek, branch of Ophir creek, Indian river, Yukon.

*Bird.* See Ciboux.

*Bird.* See Oiseau.

**Birds Hill**; village, northeast of Winnipeg, Man. (Not Bird's Hill.)

**Birdtail**; creek, tributary to Assiniboine river, western Manitoba.

**Birkby**: point, N.W. pt. of Greaves I., Smith sound, Coast district, B.C. (Not Birkly.)

**Birkenhead**; river, flowing into Lillooet river, above Lillooet lake, B.C.

**Birtle**; town, on Birdtail creek, western Manitoba. An abbreviation of the creek name.

**Bisby**; lake and river, Megantic and Wolfe counties, Que.

**Bisel**; mount, west of Nordenskiöld river, Yukon.

**Bishop**; cove, Boxer reach, Coast district, B.C.

**Bishop**; island, off the south end of Kaien island, Coast district, B.C.

**Bishop**; island, at head of Frobisher bay, N.W.T.

**Bishop**; village, Grenville county, Ont. (Not Bishop's Mills.)

*Bishop Roggan.* See Roggan.

*Bishop's Mills.* See Bishop.

**Bismarck**; hamlet, Lincoln Co., Ont., and Ponoka district, Alta. (Not Bismark.)

**Bizard**; island, St. Lawrence river, Jacques Cartier county, Que.

**Bjerre**; rock, in Okisollo channel, north of Lake point, Coast district, B.C.

**Björk**; lake, on Red Deer river, eastern Saskatchewan.

**Black**; creek, tributary to Sloko river, Cassiar district, B.C.

**Black**; island, northeast of Hecla island, lake Winnipeg, Man. (Not Big nor Grand.)

**Black**; lake, also Black Lake, village, Megantic county, Que.

*Black.* See Bélanger.

*Black.* See Garry.

*Black.* See Lynn.

*Black.* See Raisin.

*Blackbird.* See Seggemak.

*Black Charlie.* See Sheaffe.

**Black Douglas**; the northerly peak of Mt. Douglas, Rocky mountains, Alta.

*Black Duck Run.* See Harbour lake.

*Blackfeet.* See Acheninni.

**Blackfish**; bay, Radcliffe township, Renfrew county, Ont.

**Blackfoot**; coulée and hills, north of Battle river, eastern Alberta.

**Blackfox**; bend, Pelly river, near Ketza river, Yukon.

**Blackfriars**; peaks (2) southwest of Adamant mountain, Selkirk mountains, Kootenay district, B.C.

**Blackheath**; hamlet, Wentworth county, Ont. (Not Black Heath.)

*Black Iron.* See Blackstone.

*Blackney.* See Blakeney.

**Blacks**; point, south of Goderich, Huron county, Ont.

*Black Sawbill.* See Kinnickoneship.

**Blackstone**; river, tributary to the south branch of Brazeau river, central Alberta.

**Blackstone**; lake, on Cat river, west of lake St. Joseph, Patricia district, Ont. (Not Black Iron.)

**Black Sturgeon**; bay, lake and river, lake Nipigon, Thunder Bay district, Ont.

**Blackwater**; creek, lake, mountain, and range of mountains, south of Bush river, Rocky mountains, Kootenay district, B.C.

**Blackwater**; river, tributary to Fraser river, above Quesnel, Cariboo and Coast districts, B.C. (Not Black river nor West Road river.)

**Blackwell**; railway station, Lambton county, Ont. (Not Blackwall.)

**Blaeberry**; river, tributary to Columbia river, between Donald and Moberly stations, Kootenay district, B.C. (Not Blueberry.)

**Blaine**; lake, southwest of Carlton, central Saskatchewan.

**Blake**; point, S.E. end of W. Duck island, Manitoulin district, Ont. (Not Stony.)

**Blakeney**; passage, between Hanson, Cracroft and Harbledown islands, Broughton strait, Coast district, B.C. (Not Blackney.)

**Blakiston**; brook, tributary to Waterton R., Alta. (Not Kootanie nor Pass creek.)

**Blakiston**; mount, Tp. 2, R. 1, W. 5, M., southern Alberta.

**Blanchard**; river, tributary to Tatshenshini R., Cassiar district, B.C. and Yukon.

*Blanchard.* See Blanshard.

**Blanche**; river, emptying into the head of L. Timiskaming, Timiskaming dist., Ont.

*Blanche.* See Bull.

**Blanford**; bay, north shore of Hudson strait, N.W.T.

**Blanshard**; mount, southeast of Pitt lake, New Westminster district, B.C. (Not Blanchard nor The Golden Ears.)

*Blind.* See Chematogan.

*Blind.* See Coldwater.

**Blinkhorn**; mount, west of Parry bay, Vancouver island, B.C.

**Bloodletter**; island, Lake Fleet group, St. Lawrence river, Leeds county, Ont.

**Bloodvein**; river, emptying into east side of L. Winnipeg, Man. (Not Blood Vein.)

**Bloomfield**; island, off the southeast side of Grenadier island, St. Lawrence river, Leeds county, Ont. (Not Snake.)

**Blouin**; lake, Bourlamaque and Senneville townships, Timiskaming county, Que. (Not Pakitanika.)

**Blue**; ridge, between Kaslo river and Kootenay lake, Kootenay district, B.C.

**Blue**; river, tributary to Dease river, Cassiar district, B.C.

*Blue.* See Harris.

*Blueberry.* See Blaeberry.

*Blueberry.* See Mennin.

**Blue Grouse**; creek, tributary to Caribou creek, Kootenay district, B.C.

*Blue Hills of Brandon.* See Brandon hills.

**Blue Jay**; creek, flowing into Michael bay, Manitoulin I., Manitoulin district, Ont.

**Bluff**; island, Admiralty group, St. Lawrence river, Leeds county, Ont.

**Bluff**; mountain, north of Frank, southwestern Alberta.

**Bluff**; mountain, west of Sooke river, Vancouver island, B.C.

*Bluff.* See DeRottenburg.

*Bluff.* See O'Neil.

*Bluff.* See Yeo.

**Bluffy**; lake, on Wenasaga river, northwest of lac Seul, Patricia district, Ont. (Not Kah-mini-ti-gwa-quiack.)

*Blunder.* See Upper Rock.

**Blunt**; peninsula, at entrance to Frobisher bay, N.W.T. (Not Blunt's.)

**Bobb**; creek, flowing northeasterly into Bridge river, Lillooet district, B.C. (Not Babb.)

**Bobbie Burns**; creek, tributary to Spillimacheen river, Kootenay district, B.C. (Not Middle Fork, Spillimacheen river.)

**Bobbie Burns**; mount, west of the southern end of Mabel lake, Osoyoos dist., B.C.

*Bobtail.* See Naltesby.

**Bodega**; point, south of Granite point, Quadra island, Coast district, B.C.

*Bodet.* See Baudet.

**Bolger**; lake, Burleigh township, Peterborough county, Ont. (Not Bolger's.)

*Bolivia.* See Bayfield.

**Bonald**; lake, on Churchill river, Sask. (Not Moose.)

**Bonanza**; creek, flowing into the northern end of Slocan lake, Kootenay district, B.C.

**Bonanza**; creek, tributary to Klondike river, Yukon.

**Bond-Head**; village, Simcoe county, Ont. (Not Bondhead.)

*Bonfils.* See Beaufils.

**Bongard**; settlement, Marysburg North township, Prince Edward county, Ont. (Not Bongard's Corners.)

**Bonnet**; island, off northwest side of Flatland island, Thunder Bay district, Ont. (Not Reef.)

**Bonney**; island, north shore of Hudson strait, N.W.T.

**Bonney**; mount, also glacier and névé, Selkirk mountains, Kootenay district, B.C.

**Boofus**; mount, north of Gladys lake, Cassiar district, B.C.

**Boom**; lake and mountain, northwest of Storm mountain, Rocky mountains, Alta.

**Boom**; point, southern point of Cockburn island, Manitoulin district, Ont.

**Booth**; bay, east coast of Saltspring island, S.E. coast of Vancouver island, B.C.

**Booth**; creek, tributary to St. Mary river, Kootenay district, B.C.

**Bor**; a peak of the Valhalla mountains, Kootenay district, B.C.

**Bosanquet**; harbour, Big island, Hudson strait, N.W.T.

**Boshkung**; lake, Stanhope township, Haliburton county, Ont.

*Boss Dick.* See Yorke.

**Boswell**; mount, also river, Teslin river, Yukon.

**Bosworth**; mount, northwest of Stephen station, Kootenay district, B.C.

**Botsford**; lake, northeast of Minnitaki lake, Kenora district, Ont.

**Bottle**; portage, between Iron and La Croix lakes, international boundary, Rainy River district, Ont.

**Bouchette**; lake, an expansion of the upper Ottawa river, Montcalm county, Que.

**Bouchier**; island, Navy group, St. Lawrence river, Leeds county, Ont. (Not Bouchie.)

**Bouckhill**; hamlet, Dundas county, Ont. (Not Bouck's Hill.)

**Boularderie**; island, Victoria county, N.S. (Not Boulardine nor Boulardarie.)

**Boulder**; creek, branch of Bonanza creek, Klondike river, Yukon.

**Boulder**; creek, tributary to Kicking Horse river, Kootenay district, B.C.

*Boulder.* See Giegerich.

*Boulder.* See Nares.

*Boulder.* See Opabin.

*Boulder.* See Osipasinni.

*Boulder.* See Sharpe.

*Boulder.* See Slade.

*Boule.* See Bull.

**Bouleau**; river, Saguenay county, Que. (Not Bason.)

*Bouleau.* See Cedars.

**Boulter**; lake, McClure township, Hastings county, Ont.

**Boundary**; bay, on international boundary, New Westminster district, B.C.

**Boundary**; cove, between DuVernet and Dundas points, northeast of Digby island, Coast district, B.C.

**Boundary**; creek, flowing into Yukon river at the crossing of the international boundary, Yukon.

**Boundary**; creek, flowing into Kettle river, Similkameen district, B.C.

**Boundary**; mountains, international boundary, Kootenay district, B.C.

*Boundary.* See Canalaska.

**Bourgeau**; mount, also range of mountains, Rocky mountains, Alberta.

**Boutilier**; cove, lake and point; also Boutilier Point, P.O.; Halifax county, N.S. (Not Boutillier.)

*Boutillier.* See Boutilier.

**Bow**; glacier, lake, pass, peak, and river, western Alberta. (Not Coldwater lake, Upper Bow lake, Coal mountain nor Askow river.)

**Bow**; island, at junction of Oldman and Bow rivers, S.E. Alberta.

**Bow**; range of mountains in the Rockies, Alta. and B.C.

*Bow.* See Hector.

**Bowden**; lake, south of Clay lake, Kenora district, Ont.

*Bowdoin.* See McLean.

*Bowes.* See Constance.

**Bow Island**; village, southeastern Alberta.

**Bowman**; creek, west of Lower Arrow lake, Kootenay district, B.C.

**Bowmanville**; town, Durham county, Ont.

**Bowron**; lake, and river tributary to Fraser river, Cariboo district, B.C. (Not Bear.)

**Bowsman**; hamlet, also river tributary to Woody river, Man. (Not Bowsman River post office.)

**Bowtree**; lake, and river emptying into south side of lake La Ronge ,Sask.

**Boxer**; reach, east of Gribbell island, Coast district, B.C.

*Boyd.* See Belliveau.

**Boyer**; lake, south of Dinorwic lake, Kenora district, Ont. (Not Saganaga.) (New name adopted to avoid duplication of Saganaga, the name of a well known lake on international boundary west of L. Superior.)

**Boyer**; reef, east of Belcher reef, Bruce county, Ont.

**Boyer**; river, tributary to Peace river, also settlement, Alta. (Not Paddle river.) Reversal of former decision.

*Boyne.* See Morris.

**Brabant**; island, Clayoquot sound, S.W. coast of Vancouver I., B.C. (Not Pender.)

**Brachiopod**; mountain, south of Ptarmigan lake, Rocky mountains, Alberta.

**Brackendale**; settlement, on Squamish river, New Westminster district, B.C.

**Braden**; mount, also creek, west of mount McDonald, Vancouver island, B.C.

**Bradshaw**; creek, flowing into Similkameen river, between Hedley and Keremeos, Similkameen district, B.C. (Not Fifteen Mile.)

**Braeburn**; mount, also lake, northwest of lake Laberge, Yukon.

**Bramham**; island, Queen Charlotte sound, Coast district, B.C. (Not Branham.)

**Brandon**; hills, south of Brandon, Man. (Not Blue hills of Brandon.)

**Brandon**; island, Departure bay, east coast of Vancouver island, B.C. (Not Double.)

**Brandypot**; bank, channel and island, east of Hare island, St. Lawrence river, Charlevoix county, Que. (Not Brandy Pot nor Pot-à-l'eau-de-vie.)

*Branham.* See Bramham.

**Brantnober**; mount, in southwestern Yukon.

**Bras** (rivière le); river, tributary to Etchemin river, Dorchester and Lévis counties, Que. (Not Coulombe.)

**Bras d'Or**; lake, the expanse between St. Peter inlet and Barra strait, with its bays; Cape Breton, Inverness, Richmond and Victoria counties, N.S. (Not Great Bras d'Or lake.) Previous decision revised.

**Bratt**; island, west of Georgina island, St. Lawrence river, Leeds county, Ont.

**Bray**; reef, east of Ruel shoal, at entrance to Key harbour, Georgian bay, Parry Sound district, Ont.

**Bray**; settlement and railway station, Russell county, Ont. (Not Bray's nor Bray's Crossing.)

*Bray's Crossing.* See Bray.

**Brazeau**; lake and river, tributary to the North Saskatchewan, also mountain range, central Alberta. (Not Brazeau's.)

**Brébeuf**; island, in the southern portion of Georgian bay, Muskoka district, Ont. (Not Bréboeuf.)

**Brébeuf**; parish, comprising Amherst township, Labelle county, Que.

**Breeches**; lake, Garthby township, Wolfe county, Que.

**Bremner**; creek, tributary to Fitzstubbs creek, Kootenay district, B.C. (Not First North Fork.)

**Brenton**; mount, north of Chemainus river, Vancouver island, B.C.

**Brenton**; railway station, Vancouver island, B.C. (Not Brenton's.)

**Brereton**; lake, north of Rennie, southeastern Manitoba.

**Brett**; mount, northwest of mount Bourgeau, Alberta.

**Brevoort**; island, east of Beekman peninsula, N.W.T.

**Brew**; mount, on south side of Cayoosh creek, Lillooet district, B.C.

**Brewer**; creek, tributary to Stewart river, above Scroggie creek, Yukon.

**Brewery**; creek, tributary to Wild Horse river, Kootenay district, B.C.

**Brewster**; creek and glacier southwest of Banff, Alberta.

*Brian.* See Brine.

**Briand**; river, Biart township, Quebec county, Que. (Not Wamilkaszibic.)

**Bridge**; island, N. of Broughton I., St. Lawrence R., Leeds Co., Ont. (Not Chimney.)

**Bridge**; lake, east of Sheridan lake, Lillooet district, B.C. (Not Great Fish nor Tranquille.)

**Bridge**; river, flowing into Fraser river, above Lillooet, Lillooet district, B.C.

**Bridgland**; river, tributary to Thessalon river, Algoma district, Ont. (Not East branch of Thessalon river.)

**Brier**; island, at entrance to St. Mary bay, Digby county, N.S. (Not Bryer.)

**Bright**; lake, M'Clintock township, Haliburton county, Ont.

**Brighton**; township, in Northumberland county, Ont.

**Brightsand**; lake, Tps. 53 and 54, R. 20, W. 3 M., Sask. (Not Bright Sand.)

**Brine**; lake, east of St. Margaret bay, Halifax county, N.S. (Not Brian.)

**Brinston**; post village, Dundas county, Ont. (Not Brinston's Corners.)

*Brinston's Corners.* See Brinston.

**Brion**; island, Magdalen group, Gaspe county, Que. (Not Bryon, Byron, nor Cross.)

**Brisco**; range of mountains, between Columbia and Kootenay rivers, B.C.

*Brise-culotte.* See Fourchette.

*Bristol.* See Shemogue.

**Britannia Bay**; village, Carleton county, Ont. (Not Britannia-on-the-Bay.)

**British**; range of mountains, near the Arctic coast, crossed by international boundary, Alaska and Yukon.

**Britton**; mount, north of Tulameen river, Yale district, B.C.

**Broadback**; river flowing from the height of land near Mistassini lake, westerly through lake Evans to Rupert bay, Abitibi territory, Que. Includes the waters formerly named "Little Nottaway river," "Rapid river" and "Victoria river." Previous decision revised.

**Broadwood**; mount, east of Elko, Kootenay district, B.C.

**Brock**; group of islands, St. Lawrence river, west of Brockville, Leeds county, Ont. (Not Brock's.)

**Brock**; island, north of St. Lawrence island, Lake Fleet group, St. Lawrence river, Leeds county, Ont. (Not Squaw.)

**Brockway**; settlement, York county, N.B. (Not Brookway.)

**Brodeur**; island, south of Shesheeb bay, Thunder Bay district, Ont.

**Brokenhead**; river, flowing northerly into lake Winnipeg, also village, Man. (Not Broken Head.)

**Brokenmouth**; river, tributary to Nelson river, Manitoba. (Not Broken-mouth.)

**Bronson**; lake, south of Ministikwan lake, central Saskatchewan. (Not Grassy.)

**Bronte**; creek, and village, Halton Co., Ont. (Not Twelve Mile creek.)

*Brookway.* See Brockway.

**Broom**; hill, west of Sooke harbour, Vancouver island, B.C.

**Brotchie**; ledge, at southeast entrance to Victoria harbour, B.C. (Not Brotchy.)

**Broughton**; island, N.E. of Grenadier I., St. Lawrence R., Leeds Co., Ont. (Not Corn.)

**Broughton**; shoals, off Broughton island, St. Lawrence river, Leeds county, Ont. (Not Corn island shoals.)

*Brown Dome.* See Marble Dome.

**Brownie**; lake, Smellie township, Kenora district, Ont.

**Browns**; creek, tributary to Fortymile river, near international boundary, Yukon. (Not Brown nor Brown's.)

*Brown's.* See Knapp.

*Brownwater.* See Coffee.

**Bruce**; harbour, north shore of Hudson strait, N.W.T.

**Bruce**; mount, Saltspring island, southeast coast of Vancouver island, B.C.

**Bruce**; river, west of Driftpile river, central Alberta.

*Brucy's.* See Brussy.

**Bruins**; pass, in the Hermit range of the Selkirks, Kootenay, B.C. (Not Bruin's.)

**Brûlé**; point, Athabaska R., opp. mouth of Little Buffalo R., Alta. (Not Point Brûlé.)

*Brûlé.* See Grand.

*Brush.* See Sheaffe.

**Brushy**; creek, emptying into Christopherson lake, Timiskaming county, Que.

**Brussy**; point, on north side of île Perrot, Vaudreuil county, Que. (Not Brucy's.)

**Bryant**; creek, tributary to Yukon river, south of Klondike river, Yukon.

**Bryce**; mount, west of mount Alexandra, summit range of the Rockies, Alberta, and Kootenay district, B.C.

*Bryer.* See Brier.

*Bryon.* See Brion.

**Buck**; creek, tributary to Bulkley river, Cassiar district, B.C.

**Buck**; hill, north of Redflag mountain, Vancouver island, B.C.

**Buckeye**; shoal, south of Jenkins point, Manitoulin island, Manitoulin district, Ont.

**Buckham**; bay and point, Ottawa river, Torbolton township, Carleton county, Ont. (Not Buckham's nor Buckom.)

**Buck-hill**; river, tributary to Nipukatasi river, Abitibi territory, Que.

*Buckley.* See Bulkley.

*Buck's.* See Beaurivage.

**Buffalo**; lake, south of Battle river, Alberta. (Not Bull.)

*Buffalo.* See Mami.

**Buffalo Pound**; lake, north of Moosejaw, Sask. (Not Highpound.)

**Buffer**; lake, northwest of Howell, southern Saskatchewan.

**Bugaboo**; creek, flowing northeasterly into Columbia river, south of Spillimacheen Landing, Kootenay district, B.C.

**Buisson**; point west of Melocheville, Beauharnois county, Que. (Not Buisson's.)

**Bukemiga**; lake, west of lake Nipigon, Thunder Bay district, Ont.

**Bulkley**; river, tributary to Skeena river at Hazelton, Cassiar and Coast districts, B.C. (Not Buckley.)

**Bull**; river, tributary to Kootenay R., N. of Wardner, Kootenay dist., B.C. (Not Bad.)

**Bull**; river, tributary to L'Assomption river, below St. Côme, Joliette county, Que. (Not Blanche, Boule, nor Bull's.)

*Bull.* See Buffalo.

**Buller**; reef, off the south shore of Manitoulin island, Manitoulin district, Ont.

*Bullpound.* See Hanalta.

**Bulls Forehead**; hill, opposite the mouth of Red Deer river, southern Saskatchewan.

*Bumfrau.* See Beechwood.

**Bunker**; hill, south of Braeburn lake, southern Yukon.

**Buntzen**; lake, east of the North arm of Burrard inlet, New Westminster district, B.C. (Not Trout.)

**Burgess**; mount, also pass, southwest of mount Field, Kootenay district, B.C.

**Burgoyne**; bay, Saltspring island, southeast coast of Vancouver island, B.C.

**Burgoyne**; bay, south shore of Hudson strait, New Quebec.

**Burial**; point, Sansum narrows, Stuart channel, S.E. coast of Vancouver island, B.C.

**Burke**; island, south of Reid point, Bruce county, Ont.

**Burleith**; arm, Ladysmith harbour, east coast of Vancouver island, B.C.

**Burnet**; lake, west of Kennabutch lake, Kenora district, Ont.

**Burnham**; creek, tributary to Dominion creek, Indian river, Yukon.

**Burns**; creek, tributary to Indian river, Yukon.

**Burns**; lake, on telegraph trail, south of Babine lake, Coast district, B.C.

**Burnt**; island, northerly from Inner Duck island, and separated from Manitoulin island by a very narrow channel, Manitoulin district, Ont. The south end of this island was called 'Peninsular point' by Admiral Bayfield.

**Burnt**; river, Haliburton and Victoria counties, Ont.

*Burnt.* See Aubrey.

**Burnt Bay**; lake, south of Grand lake Victoria, Pontiac county, Que.

**Burnt Island**; harbour, south shore of Manitoulin island, Manitoulin district, Ont.

*Burntstone.* See Battersby.

**Burntwood**; bay, south shore of L. Seul, Kenora district, Ont.

**Burntwood**; lake, and river tributary to Nelson river, Manitoba. (Not Wepiskow.)

**Burrell**; creek, flowing southwesterly into Granby river about 24 miles from its mouth, Similkameen district, B.C. (Not East Branch of North Fork of Kettle river.)

**Burrill**; point, Active pass, strait of Georgia, New Westminster district, B.C.

**Burritt Rapids**; village, Grenville county, Que. (Not Burritt's Rapids.)

**Burton**; creek, tributary to Klondike river, Yukon.

**Burton**; island, west of Berens island, lake Winnipeg, Man. (Not Little Black.)

**Burton**; town, on Columbia river, near north end of Lower Arrow lake, Kootenay district, B.C. (Not Burton City.)

**Burwell**; port, east shore of Ungava bay, New Quebec.

**Bush**; lake, peak and river, northwest of Donald, Rocky Mts., Kootenay district, B.C.

**Bush**; mountain, between Watson and Wheaton rivers, southern Yukon.

*Bush.* See Renny.

**Butler**; bay, north of Cyrus Field bay, N.W.T.

**Butler**; lake, south of Wabigoon lake, Kenora district, Ont. (Not Kabitustigweiak.)

**Button**; islands, on south side of entrance to Hudson strait, New Quebec.

**Butwell**; peak, west of Garnet mountain, Yoho park, Rocky Mts., Kootenay dist., B.C.

**Butze**; point and rapids, between Morse basin and Shawatlan passage, east shore of Kaien island, Coast district, B.C.

**Buzzard**; lake, Burleigh township, Peterborough county, Ont.

*Byron.* See Brion.

## C

*Cabane.* See Coban.

**Cabano**; river, township and village, Temiscouata county, Que.

**Cabin**; creek, tributary to Flathead river, Kootenay district, B.C.

*Cabistachuan.* See Kabistachuan.

**Cabri**; lake, northeast of the mouth of Red Deer river, southern Saskatchewan.

**Cache**; bay, W. end of Saganaga lake, Int. boundary, Rainy River district, Ont.

**Cache**; lake, in Algonquin National park, Nipissing district, Ont.

**Cacouna**; island and village, Temiscouata county, Que.

**Cactus**; lake, southeast of Eyehill creek, Sask.

**Cadman**; point, west of Consecon, Weller bay, Prince Edward county, Ont.

**Cadwallader**; creek, tributary to south fork of Bridge river, Lillooet district, B.C.

**Cadwallader**; mountains, southwest of Cadwallader creek, Lillooet district, B.C.

**Cahill**; creek, flowing into Similkameen river, 2 miles below Hedley, Similkameen district, B.C. (Not Eighteen Mile nor Squakum.)

**Cahill**; lake, west of Slocan lake, Kootenay district, B.C.

*Cahnish.* See Kanish.

**Cain**; point, Active pass, strait of Georgia, New Westminster district, B.C.

**Cain**; river, tributary to Miramichi river, Northumberland county, N.B. (Not Cain's nor Kains.)

**Cain River**; village, Northumberland county, N.B. (Not Cain's River.)

**Cairn**; island and mountain, Richmond gulf, New Quebec.

**Calder**; creek, branch of Quartz creek, Indian river, Yukon.

**Calder**; lake, west of Manitou lake, Kenora district, Ont.

**Calder**; river, flowing southerly into Primrose lake, Sask.

*Calder.* See Couldrey.

**Caldwell**; island, point, and shoal, Thunder Bay district, Ont. (Not Crystal island nor Grassy point.)

**Caledon East**; village, Peel county, Ont. (Not East Caledon.)

**Caledonia**; village, Guysborough county, N.S. (Not Middle Caledonia.)

*Calete.* See Kaiete.

**Calf**; creek, headwaters of Klondike river, Yukon.

**Calf Pasture**; point and shoal, Brighton township, Northumberland county, Ont.

**Call Mill**; settlement, Brome county, Que. (Not Calls Mills.)

*Calvin Grove.* See Kelvingrove.

*Camamableacossa.* See Goulet.

*Camden.* See Campden.

**Camelot**; island, Lake Fleet group, St. Lawrence river, Leeds county, Ont. (Not Hog.)

**Cameron**; lake, international boundary, southwestern Alberta. (Not Oil lake.)

**Cameron**; lake, northwest of Kakagi lake, Kenora district, Ont.

**Cameron**; mountains, south of Taku arm, Cassiar district, B.C.

**Camp**; lake, Finlayson township, Nipissing district, Ont.

**Campbell**; creek, flowing westerly into Semiamu bay, New Westminster district, B.C. (Not Tahtaloo.)

**Campbell**; creek, tributary to Pelly river, Yukon. At the mouth of this stream is the site of Pelly Banks Post, abandoned in 1850.

**Campbell**; island, Admiralty group, St. Lawrence R., Leeds Co., Ont. (Not Round.)

**Campbell**; island, E. of Flatland I., Thunder Bay district, Ont. (Not Little Flatland.)

**Campbell**; mountains, N.W. of Dawson, also at upper waters of Liard river, Yukon.

**Campbell**; reef, southwest of Doreas bay, Bruce county, Ont.

**Campbell**; river, tributary to Tobique river, from Trousers lake, Victoria county, N.B. (Not Right Hand Branch of Tobique river.)

**Campbell**; valley, west of Ice river, Kootenay district, B.C.

**Campbell Cross**; village, Peel county, Ont. (Not Campbell's Cross.)

**Campbellton**; town, Restigouche county, N.B. (Not Campbell-town.)

**Campden**; post office, Lincoln county, Ont. (Not Camden.)

**Campobello**; island, N.W. of Grand Manan I., Charlotte Co., N.B. (Not Campo Bello.)

*Campo Bello.* See Welshpool.

*Canaan.* See New Canaan.

**Canalaska**; mountain, south of Porcupine river, international boundary, Yukon. (Not Boundary.)

**Canboro**; post office, Haldimand county, Ont. (Not Canborough.)

**Candle**; lake, central Saskatchewan.

**Canning**; lake, Minden township, Haliburton county, Ont. (Not Canning's.)

**Canoe**; lake, in Algonquin National park, Nipissing district, Ont.

*Canoe.* See Kamongus.

**Cañon**; lake and river, tributary to Wabigoon river, Kenora district, Ont.

*Canous.* See Kanus.

*Canouse.* See Kanus.

**Canrobert**; post village and railway station, Rouville county, Que. (Not Ange Gardien de Rouville nor L'Ange Gardien.)

*Canterbury.* See Invermere.

**Cantin**; shoal, southwest of St. Joseph, Huron county, Ont.

**Canyon**; creek, branch of Quartz creek, Indian river, and hill between lakes Laberge and Marsh, Yukon.

**Canyon**; creek, tributary to Dease river, also lake south of lake Lindeman; Cassiar district, B.C. (Not Deep.)

*Canyon.* See Mobbs.

*Canyon.* See Ormonde.

*Caousacouta.* See Kausakuta.

*Caouasagouta.* See Kausakuta.

**Cap-à-l'Aigle**; village, Charlevoix county, Que.

**Cap Brûlé**; lightstation, on cape of same name, below cap Tormentine, Montmorency county, Que. (Not Montée du Lac.)

**Cap-Chat**; lightstation and post office on cape of same name, also river and township, Gaspe county, Que. (Not Cap-de-Chate nor Cape Chatte.)

*Cap-de-Chate.* See Cap-Chat.

*Cap de Moselle.* See Demoiselle.

*Cape Chatte.* See Cap-Chat.

*Cape Horn.* See Pilot.

*Cape of Hopes Advance.* See Hopes Advance.

**Cape Negro**; island, at entrance to Negro harbour, Shelburne county, N.S. (Not Negro.)

**Cape Negro Island**; post office, on island of same name, Shelburne county, N.S.

**Capilano**; creek, flowing southerly into Burrard inlet, north of Vancouver, New Westminster district, B.C.

**Caplan**; river, and Caplan River post office, Bonaventure county, Que. (Not Capelan.)

**Caps** (rivière des); river, flowing into the St. Lawrence below Fouquette river, Kamouraska county, Que.

*Captain John's.* See Foresters.

**Caraquet**; bay, parish, river, and village, Gloucester county, N.B. (Not Caraquette.)

*Caraquet* (point). See Maisonnette.

**Carbon**; hill, south of Wheaton river, southern Yukon.

**Carcajou**; river, tributary to Kinojevis river, Timiskaming county, Que.

**Carcross**; village, between Bennett and Nares lakes, southern Yukon. (Not Caribou nor Caribou Crossing.)

*Cardinal's.* See Arcand.

**Cariboo**; district, lake, and mining division, British Columbia. (Not Caribou.)

*Cariboo.* See Stevens.

**Caribou**; creek, tributary to Dominion creek, Yukon.

**Caribou**; creek and point, east of Columbia river, between the Arrow lakes, Kootenay district, B.C.

*Caribou.* See Carcross.

*Caribou.* See Keshkabuon.

*Caribou.* See Lawrence.

*Caribou.* See Meacham.

*Caribou.* See Mudjatik.

*Caribou Crossing.* See Carcross.

**Caribou Mines**; village, Halifax county, N.S. (Not Caribou Gold Mines.)

**Carleton**; lake, west of Manitou lake, Kenora district, Ont.

**Carlsbad Springs**; post office and railway station, Russell county, Ont. (Not Eastman's Springs.)

**Carmack**; creek, a fork of Bonanza creek, Yukon.

**Carmi**; creek, tributary to Westkettle river, also village at junction of the streams, Similkameen district, B.C.

**Carnarvon**; mount, northwest of Emerald lake, Rocky mountains, Kootenay district, B.C. (Not McMullen.)

**Carnegie**; island, north of Hill island, St. Lawrence river, Leeds county, Ont.

**Carney**; creek, flowing westerly into Fry creek, Kootenay district, B.C. (Not North Fork of Fry creek.)

**Caron**; lake, Bellecombe, Caire and Vaudray townships, Timiskaming county, Que. (Not Crooked.)

**Caron**; lake, Pettypiece township, Kenora district, Ont.

**Caron**; point, east of Ste. Anne-de-Bellevue, Jacques-Cartier county, Que.

*Caron.* See Carron.

**Carp**; lake and portage, W. of Knife lake, Int. boundary, Rainy River district, Ont.

*Carp.* See Lomond.

**Carpenter**; creek, flowing westerly into Slocan lake, at New Denver, Kootenay district, B.C.

**Carpenter**; point, Wolfe island, Frontenac county, Ont. (Not Hinckley.)

**Carr**; railway station, Huntingdon county, Que. (Not Carr's Crossing.)

*Carroll.* See Macdonald.

**Carroll Wood**; bay, S. shore Manitoulin I., Manitoulin district, Ont. (Not Woods.)

**Carron**; point, at south entrance to Bathurst bay, Gloucester county, N.B. (Not Caron.) Previous decision reversed.

**Carrot**; river, tributary to Saskatchewan river, Man. and Sask. (Not Root.)

*Carrs cove.* See Kerr bay.

*Carr's Crossing.* See Carr.

**Carrying Place**; village, Northumberland and Prince Edward counties, Ont.

**Carson**; lake, Jones township, Renfrew county, Ont.

**Carson**; post office, international boundary, Similkameen district, B.C.

**Carter**; bay, east of Jenkins point, Manitoulin district, Ont.

**Carter**; mount, east of Atlin lake, Cassiar district, B.C.

**Carter**; rock, west of Greene island and south of the west end of Manitoulin island, Manitoulin district, Ont.

**Carthew**; bay, northwestern shore of L. Simcoe, Simcoe Co., Ont. (Not Carthew's.)

**Cartier**; lake, Wylie township, Renfrew county, Ont.

**Cartier**; mount, east of Columbia river, Kootenay district, B.C.

**Cartier**; village, Beauharnois county, Que. (Not Cartierville.)

*Cartierville.* See Cartier.

*Cary.* See Cook.

**Carys Swan Nest**; cape, Coats I., Hudson bay, N.W.T. (Not Cary's Swan Nest.)

**Cascade**; village, on Kettle river, Similkameen district, B.C.

*Cascade.* See Coast.

*Cascade.* See O'Hara.

**Cascumpeque**; bay, Prince county, P.E.I. (Not Cascumpec nor Holland.)

**Casey**; cove, south of Pariseau point, Digby island, Prince Rupert harbour, Coast district, B.C.

**Cashionglen**; village, Glengarry county, Ont. (Not Cashion's Glen.)

**Cassels**; lake, Cassels and Riddell Tps., Nipissing district, Ont. (Not White Bear.)

**Cassiar**; a district of British Columbia.

**Cassiar**; bar, Lewes river, south of Big Salmon river, Yukon.

**Cassiar**; creek, tributary to Yukon river, above Fortymile, Yukon.

**Cassiar**; mountains, near upper waters of Liard river, B.C. and Yukon.

**Cassidy**; lake and railway station, southwest of Cobalt, Timiskaming district, Ont. (Not Bass.)

**Cassidy**; railway station, Vancouver island, B.C. (Not Cassidy's nor Cassidy Siding.)

**Castilian**; shoal, southeast of Cockburn island, near entrance to Mississagi strait, Manitoulin district, Ont.

**Castle**; mountain and railway station, Rocky mountains, Alberta.

*Castle* (mountain). See Turret.

**Castle**; river, tributary to Oldman river, southern Alberta. (Not South Fork of Oldman river nor Southfork river.)

**Castor**; creek, tributary to Battle river, Alberta. (Not Beaverdam.)

**Castor and Pollux**; peak, east of mount Bonney, Selkirk mountains, Kootenay district, B.C.

**Cat**; lake and river, tributary to lake St. Joseph, Patricia district, Ont. (Not Cat Lake river.)

**Catamount**; peak, in the Hermit range of the Selkirks, Kootenay district, B.C.

**Cataract**; brook, tributary to Kicking Horse river, near Hector station, Kootenay district, B.C. (Not Wapta creek.)

**Cataract**; peak, northeast of mount Molar, Rocky mountains, Alberta.

**Cataract**; rock, southwest of Porcupine point, Bruce county, Ont.

*Cataract.* See Cline.

**Cataraqui**; river, flowing into lake Ontario, at Kingston, Frontenac county, Ont. (Not Cataracquay, Cataraque nor Great Cataraqui.)

*Catch.* See Ketch.

**Catchacoma**; lake, Cavendish township, Peterborough Co., Ont. (Not Ketchacum.)

*Cathawhachaga.* See Kathawachaga.

**Cathedral**; creek, tributary to Nation river, international boundary, Yukon.

**Cathedral**; mountain, east of Mt. Stephen, Kootenay district, B.C. (Not Pinnacle.)

*Catline.* See Georgina.

**Cat-tail**; brook, tributary to Opichuan river, Thunder Bay district, Ont.

*Cattle.* See Cottle.

**Causapscal**; river and village, Matane Co., Que. (Not Casupscul nor Cosupscoult.)

**Cavalier**; island, southwest of Fishing island, Bruce county, Ont. (Not Gull.)

**Cave**; rock, in Yukon river, east of international boundary, Yukon.

**Caven**; creek, tributary to Gold creek, Kootenay district, B.C. (Not Middle nor South Fork of Gold creek.)

*Cawaskikamick.* See DeVenyns.

*Cuy-ka-quah-be-kung.* See Kekkekwabi.

*Cayoose.* See Cayoosh.

**Cayoosh**; creek, tributary to Fraser river, at Lillooet, B.C. (Not Cayoose.)

**Cedar**; island, west of Massasauga point, bay of Quinte, Prince Edward county, Ont.

**Cedar**; island, east of the mouth of Cataraqui river, Frontenac county, Ont.

**Cedar**; lake, north of L. Winnipegosis, Manitoba.

*Cedar.* See Hobson.

*Cedar.* See Kishikas.

**Cedars**; island, rapids, and village, Soulanges county, Que. (Not Bouleau rapids.)

*Cegemecega.* See Kejimkujik.

*Cegoggin.* See Chegoggin.

**Celtis**; lake, south of William bay, L. Seul, Kenora district, Ont.

**Centrefire**; lake, N.W. of Minnitaki lake, Kenora district, Ont. (Not Centre Fire.)

**Centurion**; mountain and glacier, northwest of Argentine mountain, Selkirk mountains, Kootenay district, B.C.

**Chaba**; river, tributary to Athabaska river, east of Fortress lake, Alberta.

**Chabatok**; Indian village, Kabistachuan bay, Mistassini lake, Mistassini territory, Que.

*Chagoggin.* See Chegoggin.

**Chakwa**; lake, at headwaters of St. Maurice river, Champlain county, Que.

**Chaleur**; bay, an inlet of the gulf of St. Lawrence, between Quebec and New Brunswick. (Not Bay of Chaleur nor Baie des Chaleurs, etc.) If the French form is used it is to be "Baie de Chaleur."

**Chalk**; bay, river, and lake expansion of river, Buchanan township, Renfrew county, Ont. (Not Allumette bay nor Sturgeon bay and lake.)

**Chalk River**; village, Renfrew county, Ont.

*Chaloupe.* See Shallop.

**Chamberlain**; island, north shore of Hudson strait, N.W.T. (Not Crete.)

**Chambly**; village, Chambly county, Que. (Not Chambly Basin.)

**Champagne**; island and point, east of Shipman point, St. Lawrence R., Leeds Co., Ont.

**Champlain**; point, south of Atherley, at northern end of lake Simcoe, Ontario Co., Ont.

**Chancellor**; peak, east of Leanchoil station, Kootenay district, B.C.

**Chandindu**; river, tributary to Yukon river, between Dawson and Cudahy, Yukon.

**Channel**; point, northeast side of Cockburn island, Manitoulin district, Ont.

**Channel**; rock, northwest of Fitzwilliam island, Manitoulin district, Ont.

**Chantler**; post office, Welland county, Ont. (Not Chantler's.)

**Chantry**; island, southwest of Saugeen river, Bruce county, Ont. The surrounding shoal bank is named after the island.

**Chaperon**; mountain, Blackwater range of the Rockies, Kootenay district, B.C.

**Chapleau**; lake, Tp. 14, Rgs. 10 & 11, W. 2 M. southwestern Saskatchewan.

**Chaplin**; lake and river, southern Saskatchewan. (Not Old Wives.)

*Charlebois.* See Arcand.

**Charles**; island, in Hudson strait, N.W.T. (Not Katutok.)

**Charles**; point, west side of Prince Rupert harbour, Coast district, B.C.

*Charley creek.* See Kandik river.

**Charlo**; village, Guysborough county, N.S. (Not Charlo Cove nor Charlo's Cove.)

*Charlo's Cove.* See Charlo.

**Charlotte**; lake, Brudenell township, Renfrew county, Ont.

**Charlton**; bay, northeast of Leask point, Manitoulin island, Manitoulin district, Ont.

**Charlton**; mount, south of the narrows of Maligne lake, Rocky Mts., western Alberta.

**Chartier**; lake, south of Grand lake Victoria, Pontiac county, Que. (Not Wajabakoute.)

**Charwell**; point, east of Peter lightstation, Prince Edward county, Ont. (Not Gull.)

**Chase**; island, Frobisher bay, N.W.T.

**Chase**; railway station, Vancouver island, B.C. (Not Chase River Crossing.)

**Chase**; river, south of Nanaimo, Vancouver island, B.C.

*Chase River Crossing.* See Chase.

**Chassepot**; rock, S. of Tremayne bay, southern coast of Digby I., Coast district, B.C.

*Chateauguay.* See Lalonde.

**Chaudière**; falls and portage, between Namakan and Rainy lakes, international boundary, Rainy River district, Ont. (Not Kettle.)

*Chaudière.* See Koochiching.

**Cheakamus**; river, tributary to Squamish river, New Westminster district, B.C.

**Chebistuanonekau**; river, upper waters of Waswanipi river, Abitibi territory, Que.

**Chegoggin**; point and village, Yarmouth county, N.S. (Not Cegoggin nor Chagoggin.)

**Chehalis**; creek, flowing into Gladys bay, Cassiar district, B.C. (Not Che-halis.)

**Chemainus**; bay, lake, river and village, in the southwest portion of Vancouver island, B.C. (Not Horse Shoe bay.)

*Chemainus.* See Kulleet.

**Chematogan**; channel, between Squirrel and Walpole islands, L. St. Clair, Lambton county, Ont. (Not Blind.)

**Chemung**; lake and hamlet, Peterborough Co., Ont. (Not Chemong nor Shemong.)

**Cheney**; village, Russell county, Ont. (Not Cheney Station village.)

*Cheney Station.* See Cheney.

**Chensagi**; lake and river, emptying into Maikasagi lake, Abitibi territory, Que. (Not Upper Gull lake nor Tshensagi river.) Previous decision revised.

**Cheops**; mount, Selkirk mountains, Kootenay district, B.C.

**Cherry**; island, southeast of Dead island, at entrance to Key harbour, Georgian bay, Parry Sound district, Ont.

**Cherry**; lake, northwest of Lost lake, Kenora district, Ont.

**Cherry**; point, southeast of Cowichan harbour, Vancouver island, B.C.

*Cherry.* See Robert.

*Cherry.* See St. Helena.

**Cherub**; mountain, Selkirk range, Kootenay district, B.C.

**Cheslatta**; lake, south of François lake, Coast district, B.C. (Not Chestatta.)

**Chetang**; ridge, east of Mumm peak, Rocky mountains, Cariboo district, B.C.

**Cheticamp**; harbour, between Cheticamp island and the mainland of Cape Breton, Inverness county, N.S. (Not Eastern harbour.)

*Cheticamp Harbour* (village). See Eastern Harbour (village).

**Cheticamp**; island, point, post office, harbour and river, Inverness county, N.S. (Not Chetacan nor Chetican.) Previous decision enlarged.

**Cheverie**; creek and village, Hants county, N.S. (Not Chiverie.)

**Chiblow**; lake, in Montgomery and Scarfe townships, Algoma district, Ont. (Not Macoming.)

**Chibougamau**; lake and river, south of Mistassini lake, Abitibi territory, Que. (Not Chibougamou nor Chibougamoo.)

**Chichester**; island, northwest of Grenadier I., St. Lawrence river, Leeds county, Ont.

*Chickens.* See Kathlyn.

**Chicot**; river, Two Mountains county, Que. (Not Petit Chicot.)

**Chidley**; cape, at entrance to Hudson strait, New Quebec. (Not Chudleigh.)

**Chief**; island, near north end of lake Timiskaming, Timiskaming county, Que.

*Chief Mountain.* See Waterton.

**Chiefs**; island, Couchiching lake, Ontario county, Ont. (Not Chief.)

**Chiefs**; point, Amabel township, Bruce county, Ont.

**Chieftain**; hill, between Watson and Wheaton rivers, southern Yukon.

**Chignecto**; bay, between Cumberland county, Nova Scotia, and Albert and Westmorland counties, New Brunswick. (Not Chignecto channel.)

**Chikobi**; lake, Guyenne township, Timiskaming county, Que. (Not Chikobee.)

**Chikoida**; mountain and river, Ñakina river, Cassiar district, B.C.

**Chilako**; river, trib. to Nechako R., Cariboo district, B.C. (Not Chilacco nor Mud.)

*Chilanco.* See Chilanko.

**Chilanko**; river, trib. to Chilcotin R., Cariboo and Coast districts, B.C. (Not Chilanco.)

*Chilco.* See Chilko.

*Chilcote.* See Chilko.

**Chilcotin**; lake, river, and village, Cariboo and Lillooet districts, B.C.

**Childs**; lake, in Duck Mountain Forest reserve, western Manitoba.

**Chilko**; lake and river, tributary to Chilcotin river, Cariboo, Coast, and Lillooet districts, B.C. (Not Chilco nor Chilcote.)

**Chilliwack**; lake, river and town, in southern British Columbia. (Not Chilliwak, Chilliwhack, Chillukweyuk, nor Chiloweyuck.) Previous decision revised.

**Chimney**; creek, flowing into Fraser R., W. of Williams lake, Cariboo district, B.C.

*Chimney.* See Bridge.

*Chimney Island* (point). See Patterson.

**Chimo**; H. B. Co's post, Koksoak river, New Quebec. (Not Fort Chimo.)

**Chin**; coulée and post office, southern Alberta.

**China**; butte, creek and ridge, east of Westkettle river, Similkameen district, B.C.

**China**; cove and reef, near Wreck point, entrance to Georgian bay, Bruce Co., Ont.

*China Hat.* See Klemtu.

**Chiniki**; creek and lake, tributary to Bow river, also mountain, southern Alberta. (Not Chiniquy.)

*Chinimicash.* See Shinimikus.

**Chip**; lake, west of St. Ann, Alberta. (Not Dirt nor Lobstick.)

**Chipewyan**; H. B. Co. post, also settlement near western end of lake Athabaska, Alberta. (Not Fort Chipewyan.)

**Chipewyan**; lakes and river south of Birch hills, Alberta. (Not Chippawyan nor Chippewyan.)

**Chipman Corner**; village, Kings county, N.S. (Not Chipman Corners, Chipmans Corner nor Chipman's Corners.)

*Chipooin.* See Chipuin.

**Chippawa**; village, Welland county, Ont. (Not Chippewa.)

*Chippewa.* See Harmony.

*Chippewa.* See Welland.

**Chipuin**; mountain, Tp. 20, R. 27, W. 6 M., Kamloops district, B.C. (Not Chipooin.)

**Chiputneticook**; lakes, headwaters of St. Croix river, on western boundary of New Brunswick. (Not Chiputnecticook nor Chiputnaticook.)

*Chisaouataisi.* See Sassawatisi.

**Chisholm**; shoal, in Michael bay, S. shore of Manitoulin I., Manitoulin district, Ont.

**Chismaina**; lake, southeast of Teslin lake, Cassiar district, B.C.

**Chitek**; lake and river, emptying into Meadow lake, Sask. (Not Pelican.)

**Chivelston**; lake, south of Harris lake, Thunder Bay district, Ont.

*Chiverie.* See Cheverie.

*Chlorydorme.* See Cloridorme.

**Choelquoit**; lake, north of Chilko lake, Coast district, B.C.

**Chonat**; bay and point, S. shore Okisollo channel, Coast district, B.C. (Not Lake.)

*Choniaban.* See Sholiaban.

**Choquette**; bar, in Stikine R., N. of Iskut R., Cassiar district, B.C. (Not Choquette's.)

**Chorkbak**; inlet, north shore of Hudson strait, N.W.T. (Not Tchork-back.)

**Chown**; mount, about 25 miles northwest of Mt. Robson, Rocky mountains, Cariboo district, B.C.

*Chrislers.* See Crysler.

**Christie**; mount, also pass, watershed of Ross and Gravel rivers, N.W.T. and Yukon.

**Christie**; mount, southwest of Mt. Moberly and west of Athabaska river, Alta.

**Christie Lake**; hamlet, Lanark county, Ont. (Not Christy's Lake.)

**Christina**; bay, S. shore of Manitoulin island, Manitoulin district, Ont.

**Christina**; lake and river, discharging into Clearwater river, northeastern Alberta. (Not Pembina.) To avoid duplication of the name Pembina applied to a larger stream tributary to Athabaska river.

**Christopherson**; lake, north of Grand lake Victoria, Timiskaming county, Que.

**Christy**; creek, east of Whatshan lake, Kootenay district, B.C.

*Chrysler.* See Crysler.

*Chuan.* See Saltspring.

*Chuch Koone.* See Chukuni.

*Chudleigh.* See Chidley.

**Chudliasi**; bay, north shore of Hudson strait, N.W.T. (Not Chudli-a-si.)

**Chukuni**; river, north of Red lake, Patricia district, Ont. (Not Chuch Koone nor Whitefish Spawning.)

**Chungo**; creek, tributary to south branch of Brazeau river, Alberta. (Not Trail.)

**Church**; point, Markham bay, Hudson strait, N.W.T.

**Church**; point, east of Becher bay, southern coast of Vancouver island, B.C.

**Churchill**; river emptying into Hudson bay, Manitoba and Sask. (Not English nor Missinnipi.)

**Chute**; cove, Annapolis county, N.S. (Not Chute's cove.)

**Ciboux**; island, at entrance to Great Bras d'Or, Victoria county, N.S. (Not Bird nor Hiboux.)

**Cigar**; island, north of Chiefs point, Bruce county, Ont.

**Cinder**; point, eastern side of Cockburn island, Manitoulin district, Ont.

**Cinnamon**; creek, west of Lower Arrow lake, Kootenay district, B.C.

**Circle**; lake, west of Favel lake, Kenora district, Ont.

**Cirque**; peak, northeast of Bow lake, Rocky mountains, Alberta.

**Citadel**; mountain, Sir Sandford range, Selkirk mountains, Kootenay district, B.C.

*Citron.* See Gordon.

**Citrouille**; point, St. Lawrence river, Champlain county, Que.

**Clachnacudainn**; range of mountains and snowfield, Selkirk mountains, Kootenay district, B.C. (Not Clach-na-coodin.)

*Clair.* See DeVenyns.

**Clairvaux-de-Bagot**; village, Bagot county, Que. (Not Clairvaux de Bagot.)

*Clairville.* See Humber.

**Clapham**; lake, Thetford township, Megantic county, Que.

**Clappison**; settlement, Wentworth county, Ont. (Not Clappison's Corners.)

*Clark Fork.* See Pend d'Oreille.

**Clark**; harbour, Cornell Grinnell bay, N.W.T. (Not Frank Clark.)

**Clark**; lake, Dungannon township, Hastings county, Ont. (Not Clark's.)

**Clark**; point, Gabarus bay, Cape Breton county, N.S. (Not Low.) New name to avoid confusion with Low point and Low Point P.O., George bay, Inverness Co.

**Clark**; point and reef, Bruce county, Ont. (Not Pine Point nor Clark Point reef.)

**Clarke**; glacier and peak, S.E. of Mt. Bonney, Selkirk Mts., Kootenay district, B.C

**Clarke**; island, Blind bay, Halifax county, N.S. (Not Clarke's.)

**Claude**; lake, near northerly end of lake Manitoba, Man.

**Clay**; brook and lake, Villeneuve township, Labelle Co., Que. (Not Clay Brook lake.)

**Clay**; river, tributary to Bell river, Timiskaming county, Que.

**Clayoquot**; sound, also post village on Stubbs island in the sound, west coast of Vancouver island, B.C.

*Clayoquot.* See Opitsat.

**Clear**; creek, tributary to Stewart river, Yukon.

*Clear.* See Behrman.

*Clear.* See Sasaginaga.

*Clear.* See Smoothrock.

*Clear.* See Wakomata.

**Clearwater**; river, tributary to Athabaska river at McMurray, Alta. and Sask.

**Clearwater**; river, tributary to Stikine river, Cassiar district, B.C.

**Clearwater**; river, tributary to the North Saskatchewan, at Rocky Mountain House, Alta.

*Clear Water.* See Madge.

*Clear Water.* See Reader.

*Clearwater.* See Teggan.

**Cleaveland**; point, north shore of St. Margaret bay, Halifax county, N.S. (Not Cleveland.)

**Cleftrock**; lake, west of Manitou lake, Kenora district, Ont. (Not Cleft Rock.)

**Clements**; land, the southeastern portion of Baffin island, N.W.T.

**Cleopatra**; island; southwest of Grenadier I., St. Lawrence river, Leeds county, Ont.

*Cleveland.* See Cleaveland.

**Cliff**; lake, southwest of Perrault lake, Kenora district, Ont. (Not Mountain.)

**Cline**; mount, Rocky Mountains, also river, flowing into the North Saskatchewan, Alberta. (Not White Goat nor Cataract.)

**Clinton**; creek, near Cudahy, Yukon.

**Clinton-Colden**; lake, northeast of Great Slave lake, N.W.T. (Not Clinton Golden.)

**Clio**; bay and point, Kitimat arm, Coast district, B.C.

*Clondyke.* See Klondike.

*Cloridon.* See Cloridorme.

**Cloridorme**; township and village, Gaspe county, Que. (Not Cloridon, Chlorydorme nor Chlorydormes.)

*Cloyah.* See Kloiya.

**Club**; island, southwest of Rockport, St. Lawrence river, Leeds county, Ont.

**Cluster**; rocks, Ladysmith harbour, east coast of Vancouver island, B.C.

**Clyde Corners**; hamlet, Huntingdon county, Que. (Not Clyde's Corners.)

*Coac.* See Koak.

**Coachman**; head, east side of Mahone bay, Lunenburg county, N.S. (Not Covey.)

**Coal**; creek, tributary to Elk river, at Fernie, Kootenay district, B.C.

**Coal**; creek, tributary to Yukon river, below Fortymile, Yukon.

**Coal**; creek, lake and ridge, north of Watson river, Yukon.

*Coal.* See Kirby.

**Coast**; island, west of Ridley island, Coast district, B.C.

**Coast**; range of mountains, in western part of British Columbia. (Not Cascade.)

**Cobalt**; lake and town, Timiskaming district, Ont.

**Coban**; river, tributary to Waswanipi river, below Otchisk river, Abitibi territory, Que. (Not Cabane.)

**Cobb**; lake, Russell county, Ont. (Not The lake.)

**Cobble Hill**; post office, west of Saanich inlet, Vancouver I., B.C.

**Cocagne**; harbour, island, river and town, Kent county, N.B. (Not Cocaigne.)

**Cochrane**; river, flowing into Deer lake, south of Island lake, Patricia district, Ont.

*Cock.* See South Fowl.

**Cockburn**; island, Brock group, St. Lawrence river, Leeds county, Ont. (Not Picnic.)

**Cockburn**; island, Manitoulin district, Ont.

**Cockburn**; land, in N.W. portion of Baffin island, N.W.T. (Not Cockburn island.)

**Cockle**; creek, flowing westerly into Duncan river, Kootenay district, B.C. (Not Bear.)

*Cockmagun.* See Cogmagun.

*Cockmigon.* See Cogmagun.

**Cockscomb**; mountain, near the headwaters of Jumpingpound creek, southern Alberta.

**Coehill**; village, Hastings county, Ont. (Not Coe Hill nor Coe Hill Mines.)

**Coffee**; river, tributary to Bell river, Timiskaming county, Que. (Not Brownwater.)

**Coffey**; hamlet, Huntingdon county, Que. (Not Coffey's Corners.)

*Coffey's Corners.* See Coffey.

**Cogle**; pass, at head of St. Mary river, Kootenay district, B.C.

**Cogmagun**; river, Hants county, N.S. (Not Cockmagun, nor Cockmigon.)

*Colborne.* See Colburne.

*Colbourne.* See Colburne.

**Colburne**; passage between Piers island and Saanich peninsula, southeast coast of Vancouver island, B.C. (Not Colborne nor Colbourne.)

**Cold**; brook, tributary to Gizzard river, Abitibi territory, Que.

**Cold**; lake, north of Beaver river, on Alberta and Saskatchewan boundary.

*Cold.* See Kississing.

**Coldbrook**; hamlet and railway station, Kings county, N.S. (Not Cold Brook Station, P.O.)

*Cold Brook.* See Colebrooke.

**Coldstream**; river, flowing into lake St. Francis, Frontenac and Megantic counties, Que.

**Coldwater**; river, emptying into east end of L. Superior, Algoma, Ont. (Not Blind.)

*Coldwater.* See Bow.

**Cole**; point, northwest point of Big island, bay of Quinte, Prince Edward county, Ont. (Not Cole's.)

**Cole**; rapids, North Saskatchewan river, near confluence with South Saskatchewan, Sask. (Not Cole's nor LaColle.)

**Colebrooke**; settlement, south of Campbellton, Restigouche county, N.B. (Not Coldbrook nor Cold Brook.)

**Coleman**; cove and harbour, west of entrance to St. Margaret bay, Lunenburg county, N.S. (Not Coleman's.)

**Coleman**; island, Sagemace bay, lake Winnipegosis, Manitoba.

**Coleman**; mount, southeast of mount Athabaska, Rocky mountains, Alberta.

**Coleraine**; township and village, Megantic county, Que. (Not Colraine nor Coleraine Station post office.)

**Collie**; mount, northwest of mount Balfour, Rocky mountains, Kootenay district, B.C.

*Collie.* See Yoho.

**Collier**; island, Navy group, St. Lawrence river, Leeds county, Ont. (Not Collyer.)

**Collins**; shoal, Ladysmith harbour, east coast of Vancouver island, B.C.

**Collinson**; point, Active pass, strait of Georgia, New Westminster district, B.C.

**Colmer**; cape, at entrance to Crooks inlet, Hudson strait, N.W.T.

*Colombe;* See Coulombe.

**Colquhoun**; island, in St. Lawrence river, below Cornwall, Glengarry county, Ont. (Not Colquhon nor Colquhouns.)

*Colraine* See Coleraine.

**Columbia**; lake, at source of Columbia river, Kootenay district, B.C. (Not Upper Columbia.)

**Columbia**; mount, also glacier and snowfield, west of Mt. Bryce, summit range of the Rockies, Alta., and Kootenay district, B.C.

**Columbia**; river, Kootenay district, B.C.

**Comb**; islands and river, east side of James bay. (Not Comb Hills islands and river.)

**Comb**; mountain, between Hamill and Cline creeks, Kootenay district, B.C.

*Commandant.* See Papineau.

**Commerell**; point, south side of Raft cove, northwest coast of Vancouver island, B.C.

*Commerell.* See Sutil.

**Commissioners**; lake, Lake St. John county, Que. (Not Commissioner.)

**Compass**; lake, Burleigh township, Peterborough county, Ont.

**Comporté**; river, tributary to Murray river, Charlevoix county, Que.

**Cone**; hill, near mouth of Clinton creek, Yukon.

**Cone**; mountain, near Stikine river, north of Scud river, Cassiar district, B.C.

**Cone**; mountain, north of Spray mountains, Rocky Mountains park, Alberta.

**Cone**; point, on the west side of lake Evans, Abitibi territory, Que.

**Connaught**; mount, in the big bend of Salmon river, Kamloops district, B.C.

**Conn Mills**; village, Cumberland county, N.S. (Not Conn's Mills.)

**Connolly**; mount, between Mackenzie sound and Sutlej channel, Coast district, B.C. (Not Conolly.)

**Conrad**; mining camp, Windy arm, Tagish lake, Yukon. (Not Conrad City.)

**Conrad**; mount, east of Windy arm, Tagish lake, Cassiar district, B.C., and Yukon.

**Conran**; island, Brock group, St. Lawrence river, Leeds county, Ont. (Not Refugee.)

**Consecon**; lake and village, east of Weller bay, Prince Edward county, Ont.

**Consolation**; creek, emptying into Gladys lake, Cassiar district, B.C.

**Consolation**; valley, east of Moraine lake, Alberta.

*Conspicuous peak.* See Empress mountain.

**Constance**; island, between Georgina and Hill islands, St. Lawrence river, Leeds county, Ont. (Not Bowes.)

**Contact**; brook and lake, southeast of File lake, Manitoba.

**Conuma**; peak, northeast of Nootka sound, Vancouver island, B.C.

**Cony**; creek, near mount Woden, Kootenay district, B.C.

**Cook**; island, northeast of Grenadier island, St. Lawrence river, Leeds county, Ont.

**Cook**; lake, Britton township, Kenora district, Ont.

**Cook**; point, below Rockport, Leeds county, Ont. (Not Cary nor Cook's.)

**Cook**; railway station, Haldimand county, Ont. (Not Cook's.)

**Cooking**; lake, in Tps. 51 and 52, R. 21, and Tp. 51, R. 22, W. 4th M., Alberta.

*Coolen.* See Coonan.

**Coonan**; cove, Shag bay, Halifax county, N.S. (Not Coolen.)

**Cooper**; creek, flowing easterly into Duncan river, north of Kootenay lake, Kootenay district, B.C.

**Cooper**; lake, an expansion of Marten river, Mistassini territory, Que.

**Cooper**; mount, near Hutshi lakes, Yukon.

**Cooper**; mountain and pass, at headwaters of Cooper creek, Kootenay district, B.C.

**Cooper**; point, south shore of Okisollo channel, Coast district, B.C.

**Copeau**; river, tributary to Red Deer river, eastern Saskatchewan.

**Copeland**; mount, Gold range, northwest of Revelstoke, Kootenay district, B.C.

**Copeway**; lake, Lake township, Hastings county, Ont.

**Copper**; creek, tributary to Hackett river, Cassiar district, B.C.

**Copper**; island, in southern portion of Atlin lake, Cassiar district, B.C.

*Copper.* See Zymoetz.

*Copper Indian.* See Taltson.

**Coquihalla**; lakes, mountain and river, Yale district, B.C. (Not Coquahalla.)

**Coral**; mountain, Beaverfoot range, Yoho park, Rocky Mts., Kootenay district, B.C.

*Corbay.* See Corbeil.

**Corbeil**; point, northern entrance to Batchawana bay, Herrick township, Algoma district, Ont. (Not Corbay.)

**Corbin**; pass and peak, north of Illecillewaet, Kootenay district, B.C.

**Cordero**; channel, N. of Sonora and Thurlow Is., Coast district, B.C. (Not Cardero.) Josef Cordero was the draughtsman of Galiano's expedition in the "Sutil" and "Mexicana," 1792. (Walbran's British Columbia Coast Names.)

**Cordova**; bay, southeast coast of Vancouver island, B.C. (Not Cormorant.)

*Cordova.* See Saanichton.

**Corisande**; bay, east shore of lake Huron, Bruce county, Ont

**Cormorant**; lake, northwest of Moose lake, Manitoba.

*Cormorant.* See Cordova.

**Corn**; island, southeast of Gananoque, St. Lawrence river, Leeds county, Ont.

**Corn**; lake, Redditt township, Kenora district, Ont.

*Corn.* See Broughton.

**Corneille**; point, below Goose cape, St. Lawrence river, Charlevoix county, Que.

**Cornet**; ground, southwest of Greenough point, Bruce county, Ont.

**Cornice**; peak, southerly spur of mount Palmer, also glacier, Selkirk mountains, Kootenay district, B.C.

*Corn island shoals.* See Broughton.

**Cornwall**; island, north of Grinnell peninsula, N.W.T. (Not North Cornwall.)

**Cornwallis**; island, west of Devon island, N.W.T.

**Cornwall Park**; a summer resort on east extremity of Big island, bay of Quinte, Prince Edward county, Ont.

**Coronation**; mountain, north of Chemainus river, Vancouver island, B.C.

**Corral**; creek, tributary to Bow river, east of lake Louise, Alberta.

**Corry**; lake, an expansion of Chalk river, Renfrew county, Ont. (Not Corry's nor Curry's.)

**Corsair**; mountain, N.E. of Blackwater range of the Rockies, Kootenay district, B.C.

**Corsair**; reef, west of Reid point, Bruce county, Ont

**Corwin**; valley, north of Bennett lake, southern Yukon.

**Cosine**; lake, southeast of Eychill creek, Sask.

**Coste**; island, Kitimat arm, Coast district, B.C.

**Costigan**; mount, northeast of Minnewanka lake, Rocky Mountains park, Alberta.

*Cosupscoult.* See Causapscal.

**Coteau**; lake, Tp. 27, R. 8, W. 3 M., also creek flowing from the lake into the South Saskatchewan river, Sask. (Not Red Deer.)

**Côte-des-Neiges-Ouest**; village, Laval county, Que. (Not Côte des Neiges West.)

**Cottle**; hill, northwest of Departure bay, Vancouver island, B.C. (Not Cattle.)

**Cottonwood**; creek, tributary to Waskana creek, southeastern Saskatchewan.

**Cottonwood**; river, tributary to Dease river, Cassiar district, B.C.

**Couchiching**; lake, north of lake Simcoe, Ontario and Simcoe counties, Ont.

**Coudres**; island, Charlevoix county, Que. French usage, Ile aux Coudres.

**Cougar**; brook and mountain, in the Selkirk mountains, Kootenay district, B.C.

**Cougar**; creek, tributary to Little Slocan river, Kootenay district, B.C.

**Couldrey**; creek, flowing easterly into Flathead river, near international boundary, Kootenay district, B.C. (Not Calder.)

**Coulombe**; lake and river, emptying into L. Aylmer, Wolfe Co., Que. (Not Colombe.)

*Coulombe.* See Bras.

**Countess Warwick**; sound, north shore Frobisher bay, N.W.T.

**Country**; island, with lightstation thereon, Country harbour, Guysborough county, N.S. (Not Green.) To avoid duplication of "Green island lightstation," Richmond county.

**Counts**; bank, southwest of Dead island, at entrance of Key harbour, Georgian bay, Parry Sound district, Ont.

**Courcelles**; parish and post office, Frontenac county, Que.

**Courtenay**; bay, St. John harbour, N.B. (Not Courtney.)

**Coutlee**; plateau and town, Kamloops district, B.C. (Not Coutlie.)

**Coutts**; river, tributary to Saulteux river, central Alberta.

**Cove**; island, entrance of Georgian bay, Bruce county, Ont. (Not Isle of Cove.)

**Cove Island**; ground, off N.W. side of Cove island, Georgian bay, Bruce county, Ont.

*Covey.* See Coachman.

**Cow**; island, in bay of Quinte, east of Belleville, Prince Edward county, Ont.

*Cow.* See Morien.

**Cowan**; lake and river, tributary to Beaver river, central Sask. (Not Crooked.)

**Cowan**; river, north of Cormorant lake, Manitoba.

**Cowan**; village, Huntingdon county, Que. (Not Cowan's.)

*Cow Bay.* See Port Morien.

**Cowichan**; district, harbour, lake, post office and river, Vancouver island, B.C. (Not Cowichin nor Cowitchin.)

*Cowichan.* See Separation.

*Cowitchin.* See Cowichan.

**Cox**; lake, Burleigh township, Peterborough county, Ont. (Not Cox's.)

**Coyle**; cove and head, W. side of Blind bay, Halifax Co., N.S. (Not Coyle's nor Kieley.)

**Crab**; cove, south of Red bay, Bruce county, Ont.

*Craigs.* See Stanley.

**Cranberry**; creek, near north end of Upper Arrow lake, Kootenay district, B.C.

**Cranberry**; lake, on Grass river, west of Reed lake, Manitoba.

**Cranbrook**; town, Kootenay district, B.C.

**Crane**; bay, lake and river, at northerly end of lake Manitoba, Man.

**Crater**; creek, flowing into Quiet lake, Yukon.

**Crater**; lake, southwest of lake Lindeman, Cassiar district, B.C.

**Crayfish**; lake, on Grassberry river, central Saskatchewan. (Not Lobster.)

**Crean**; creek and lake, tributary to Montreal lake, central Sask. (Not Trout.)

**Crease**; island, off the entrance to Knight inlet, Coast district, B.C. (Not Lewis.)

**Credit Forks**; village, Peel county, Ont. (Not Forks of Credit.)

*Creighton.* See Crichton.

**Crémazie**; lake, Sabourin township, Timiskaming county, Que. (Not Sturgeon.)

*Crete.* See Chamberlain.

**Crichton**; beach, head, island and shoal, southwest of Madame island, Richmond county, N.S. (Not Creighton.)

**Croil**; island, near Farran point, Stormont county, Ont. (Not Croil's.)

**Crooked**; creek, tributary to Stewart river, Yukon.

**Crooked**; lake, international boundary, Rainy River district, Ont.

**Crooked**; lake, on Qu'Appelle river, southeastern Saskatchewan.

*Crooked.* See Caron.

*Crooked.* See Cowan.

*Crooked.* See Wakaw.

**Crooks**; inlet, north shore of Hudson strait, N.W.T. (Not Ka-lik-took-duag.)

**Crosby**; lake, in McVittie township, Timiskaming district, Ont.

**Cross**; lake, north of Pipestone lake, Nelson river, Manitoba.

**Cross**; point, also Cross Point, village, Mann township, Bonaventure county, Que. (Not Crosspoint P.O.) For the point the French form is authorized for French maps.

**Cross**; river, flowing southwesterly into Kootenay river, Kootenay district, B.C.

*Cross.* See Bamaji.

*Cross.* See Brion.

*Cross.* See Paquin.

**Crossman**; post office, Albert county, N.B. (Not Niagara.)

**Crow**; river, Hastings, Northumberland and Peterborough counties, Ont.

*Crow.* See Kakagi.

**Crowfoot**; creek, flowing into Bow river, southwest of Crowfoot station, southern Alberta.

*Crow Harbour.* See Queensport.

**Crowlodge**; creek, tributary to Oldman river, southern Alberta.

**Crown**; lake, Lorrain township, Timiskaming district, Ont.

**Crown**; mountain, in central part of Vancouver island, B.C.

**Crowsnest**; lake, mountain, pass, railway station and river, Alberta and Kootenay district, B.C. (Not Crow Nest, Crow's Nest, Crow-nest nor Crownest.)

**Crysler**; island, St. Lawrence river, Dundas county, Ont. (Not Chrysler.)

**Crysler**; village, Stormont county, Ont. (Not Chrysler.)

**Crystal**; bay, southwest of Thunder bay, L. Superior, Ont.

**Crystal**; butte, creek and mountain, east of Beaverdell creek, Similkameen district, B.C. (Not S. fork of Beaver creek.)

*Crystal.* See Caldwell.

**Cudahy**; post, Yukon river, northwest of Dawson, Yukon.

**Cugnet**; river, tributary to Beaurivage river, Lévis county, Que. (Not Cuignet nor Quenotte.)

*Cuignet.* See Cugnet.

**Cultus**; lake, near international boundary, New Westminster district, B.C. (Not Swehl-tcha.)

**Cumberland**; lake, eastern Saskatchewan. (Not Pine Island lake.)

**Cumberland**; peninsula and sound, in southeastern portion of Baffin island, N.W.T. (Not Northumberland inlet, Hogarth sound nor Penny gulf.)

**Cumming**; point, Drury inlet, Queen Charlotte sound, Coast district, B.C. (Not Cuming nor Cummings.)

**Cumming**; point, Gribbell island, Coast district, B.C.

**Cundale**; bay, east shore of Horsfall island, Hecate channel, Coast district, B.C.

**Cunliffe**; island, Navy group, St. Lawrence river, Leeds county, Ont. (Not Gunliffe.)

**Cupola**; mountain, Selkirk range, Kootenay district, B.C.

**Currie**; mount, west of Lillooet lake, Lillooet district, B.C.

**Currie**; village, Oxford county, Ont. (Not Currie's Crossing.)

*Currie's Crossing.* See Currie.

*Curry's.* See Corry.

**Curtain**; falls, between Crooked and Iron lakes, Int. boundary, Rainy River dist., Ont.

**Curtis**; peak, southeast of Mt. Biddle, Rocky mountains, Kootenay district, B.C.

*Cut.* See Lindsay.

**Cutarm**; river, tributary to Qu'Appelle river, southern Sask. (Not Big Cutarm.)

**Cutknife**; creek and hill south of Battle river, Sask. (Not Cut Knife.)

**Cyclone**; peak, an outlying spur of mount Drummond, Rocky mountains, Alberta.

**Cypress**; hills, southern Alberta and Saskatchewan.

**Cypress**; lake, south of Cypress hills, southwestern Saskatchewan.

**Cypress**; lake, southwest of Saganaga lake, Int. boundary, Rainy River district, Ont.

**Cypress**; river, tributary to Assiniboine river, southern Manitoba.

**Cyprian**; peak, in the Bishops range, Selkirk mountains, Kootenay district, B.C.

**Cyrus Field**; bay, east shore of Baffin island, N.W.T. (Not Cyrus W. Field.)

## D

**Dack**; spit, west of Port Elgin, Bruce county, Ont.

*Dadancour.* See Giroux.

**Dago**; creek, tributary to Little Slocan river, Kootenay district, B.C.

**Dahadinni**; river, trib. to Mackenzie R., N.W.T. (Not Dahadinee nor Dahadinne.)

**Dail**; creek and peak, west of Windy arm, Tegish lake, Yukon.

**Dainard**; creek, tributary to Moose creek, also lake east of the creek, Yoho park, Rocky mountains, Kootenay district, B.C.

**Daisy**; lake, emptying into Cheakamus river, New Westminster district, B.C.

**Dalesville**; river, tributary to West river, Argenteuil county, Que. (Not Middle Branch of West River.)

*Dalhousie Mills.* See Dalhousie Station.

**Dalhousie Station**; village, Soulanges county, Que. (Not Dalhousie Mills.)

*D'Alogmy.* See Maple.

**Dalton**; range of mountains, near Dezadeash lake, southwest Yukon.

**Daly**; mount, southeast of mount Balfour, Rocky mountains, Kootenay district, B.C.

**Dane**; island, east of Lyal island, Bruce county, Ont.

**Daniels**; lake, north of Linklater lake, Kenora district, Ont. (Not Daniel nor Danish.)

*Danish.* See Daniels.

**Daoust**; mount, south of Lewes river, Yukon.

**Dares**; point, east side of Mahone bay, Lunenburg county, N.S. (Not Indian.)

**Dark**; island, Admiralty group, St. Lawrence river, Leeds county, Ont.

*Dark.* See Aubrey.

**Darlens**; river, Darlens township, Timiskaming county, Que. (Not Bear.)

**Darlington**; village and township, Durham county, Ont.

**Dashwood**; island, east of Wallace island, St. Lawrence river, Leeds county, Ont.

**Dasserat**; lake, Timiskaming county, Que. (Not Island, Mattawagosik nor Obadowagashing.) Previous decision revised.

**Dauphin**; lake and town, western Manitoba.

**Dauphin**; river, emptying into Sturgeon bay, lake Winnipeg, Man. (Not Little Saskatchewan.)

**Dauphinee**; head, Hubbard cove, mountain north of Head harbour, Halifax county, and lake northeast of St. Margaret bay, Halifax and Lunenburg counties, N.S. (Not Dauphiney nor Dauphney.)

*Dauphney.* See Dauphinee.

**Dave**; bay, south side of Great Duck island, Manitoulin district, Ont.

**Davenport**; creek, flowing into west end of Gladys lake, Cassiar district, B.C.

**David**; lake, east of Sandpoint lake, Rainy River district, Ont. (Not Whitefish.)

**David**; point, Shawatlan passage, northeast of Kaien island, Coast district, B.C.

**Davidson**; mountains, between Ladue valley and McQuesten lakes, Yukon.

**Davies**; lake, west of Barnard lake, Thunder Bay district, Ont.

**Davis**; creek, branch of Walker creek, west of Dawson, Yukon.

**Davis**; creek, flowing northeasterly into Kootenay lake, south of Lardeau, Kootenay district, B.C.

**Davis**; island, Navy group, St. Lawrence river, Leeds county, Ont.

**Davis**; lake, Lutterworth township, Haliburton county, Ont. (Not Davis'.)

**Davy**; lake and river, Trécesson township, Timiskaming county, Que. (Not Davie.)

*Dawkins.* See Jorkins.

**Dawson**; bay, in northwestern portion of L. Winnipegosis, Manitoba.

**Dawson**; capital city of Yukon territory. (Not Dawson City.)

**Dawson**; island, lake Nipigon, Thunder Bay district, Ont.

**Dawson**; mount, also glacier, southeast of mount Bonney, Selkirk mountains, Kootenay district, B.C.

**Dawson**; peak, near Teslin lake, Yukon.

**Dawson**; point, at the northerly end of Primrose island, Coast district, B.C.

**Dawson**; point, at the head of lake Timiskaming, Ont.

**Dawson**; range of mts., at confluence of Lewes, Pelly, and Yukon rivers, Yukon.

*Dawsonvale.* See Dawsonville.

**Dawsonville**; town, Restigouche county, N.B. (Not Dawsonvale.)

**Dayman**; island, west of Kuper island, S.E. coast of Vancouver island, B.C.

**Deacon**; lake, Melick, Pettypiece, and Redditt Tps., Kenora district, Ont. (Not Ant.)

**Dead**; island, also Dead Island reef, at entrance to Key harbour, Georgian bay, Parry Sound district, Ont.

**Deadman**; harbour and head, Charlotte county, N.B. (Not Deadman's.)

**Deadman**; islets (2), east of Beck island, also channel between islets and spit extending north from Felice island, Clayoquot sound, Vancouver island, B.C.

**Deadwood**; creek, tributary to Yukon river, below Dawson, Yukon.

**Dean**; bay and spit, east of Dominion point, Manitoulin district, Ont.

**Dease**; lake and river, tributary to Liard river, Cassiar district, B.C.

**Deathdealer**; island, Lake Fleet group, St. Lawrence river, Leeds county, Ont.

**De Beaujeu**; island, St. Lawrence river, Soulanges county, Que. (Not Grande île aux Erables.)

**Debert**; river and village, Colchester county, N.S. (Not DeBert.)

*Debert.* See Masstown.

**Deception**; bay, south shore of Hudson strait, New Quebec. (Not Foster's Harbour nor Shedlui.)

**De Cewville**; village and railway station, Haldimand Co., Ont. (Not Decewsville.)

**Decker**; lake, on telegraph trail, south of Babine lake, Coast district, B.C.

**De Courcy**; group of islands, Pylades channel, southeastern coast of Vancouver island, B.C. (Not DeCourcey.)

*Deep.* See Canyon.

*Deep creek.* See Trepanege river.

*Deep Eau.* See Depot.

**Deepwater**; lake, northeast of lake Timiskaming, Timiskaming county, Que.

**Deer**; island, 1½ m. N. W. from Gull harbour, L. Winnipeg, Man. (Not Punk.)

*Deer.* See Atikwa.

*Deer.* See Georgina.

*Deer.* See Punk.

**Deer Park**; mountain and post office, east of Lower Arrow lake, Kootenay district, B.C. (Not Deer mountain.)

**Defot**; mount, also creek, Dease river, Cassiar district, B.C.

**Delany**; lake, southeast of Lount lake, Kenora district, Ont.

**Delap Cove**; village, Annapolis county, N.S. (Not Delap's Cove.)

**Delisle**; river, Glengarry county, Ont. (Not De Lisle nor L'Isle.)

**Deltaform**; mountain, Bow range of the Rockies, Alta. and Kootenay district, B.C.

**Delthore**; mount, Gravel river, N.W.T.

**Delusion**; bay, in southern portion of Digby island, Coast district, B.C.

**Demaniel**; creek, flowing into Sooke harbour, Vancouver island, B.C.

**Demers**; a peak of the Valhalla mountains, Kootenay district, B.C. (Not DeMers.)

**Demers**; rock, east of Brandypot channel, St. Lawrence river, Temiscouata Co., Que.

**Demoiselle**; cape and creek, Albert county, N.B. (Not D'Moiselle, Cap de Moselle, nor Cape de Moiselle.)

**De Montigny**; lake, Timiskaming county, Que. (Not Kienawisik.)

**Denise**; arm, northeast arm of Morse basin, east of Kaien island, Coast district, B.C.

**Denmark**; lake, south of Atikwa lake, Kenora district, Ont.

**Dennis**; creek, tributary to Wilson creek, near Rosebery, Kootenay district, B.C. (Not E. F. Wilson creek.)

**Dennis**; mount, also pass, south of mount Stephen, Kootenay district, B.C.

*Dennis.* See Denys.

**Dent**; mount, north of Blaeberry river, Rocky mountains, Kootenay district, B.C.

**Denver**; creek, tributary to St. Mary river, Kootenay district, B.C.

**Denver**; mount, west of Slocan lake, Kootenay district, B.C.

**Denys**; river, Inverness county, N.S.; also River Denys P.O., River Denys Road P.O. River Denys Station P.O. (Not Dennis.)

**Departure**; bay, north of Nanaimo, Vancouver island, B.C.

**Depot**; creek and lake, Hinchinbrooke township, Frontenac county, Ont. (Not Deep Eau.)

**Depot**; island, west of Supply point, Depot harbour, Parry Sound district, Ont. (Not Supply.)

**DeRottenburg**; island, Brock group, St. Lawrence R. Leeds Co., Ont. (Not Bluff.)

**Derry**; hamlet, Peel county, Ont. (Not Derry West.)

*Derry West.* See Derry.

**DeSalaberry**; island, St. Lawrence river, Beauharnois county, Que. (Not Grand.)

**Descanso**; bay, Gabriola island, strait of Georgia, B.C. (Not Knight nor Rocky.)

**Deschaillons**; seigniory and post village, Lotbinière county, and island in Richelieu river, Richelieu county, Que. (Not d'Eschaillons, des Chaillons, Eschaillons, St. Jean Deschaillons nor St. Jean-Baptiste Deschaillons.)

**Deschambault**; lake and river flowing from Wapawekka lake, central Saskatchewan. (Not Bear Lake river.)

**Deschênes**; hamlet, Ottawa county, Que. (Not Deschenes Mills.)

*Deschesnes Mills.* See Deschêsnes.

**D'Escousse**; harbour, and village, Madame island, Richmond county, N.S. (Not Descouse, Descousse nor Discousse.)

**Deseronto**; town, Tyendinaga township, Hastings county, Ont.

**Desert**; point, N.E. end of Great Duck island, Manitoulin district, Ont. (Not Sand.)

*Deseticaux.* See Azatika.

*Desolation.* See Ten Peaks.

*Desolation.* See Wenkchemna.

*Despair.* See Espoir.

*Despatch.* See Dispatch.

**DeStein**; point, west of Russell arm, Prince Rupert harbour, Coast district, B.C.

**DeVenyns**; lake, in the upper portion of St. Maurice county, Que. (Not Cawaskikumick nor Clair.)

**Deville**; mount, northwest of Ottertail station, Rocky Mts., Kootenay district, B.C.

**Devils Head**; mountain, in the Rocky Mountains park, Alberta. (Not Devil's Head.)

*Devil's Head* (lake). See Minnewanka.

*Devil's Pine.* See Ghostpine.

**Devizes**; lake, west of Barrington lake, Thunder Bay district, Ont.

**Devon**; island, northwest of Baffin island, N.W.T. (Not North Devon.)

**DeWatteville**; island, southeast of the Brock group, St. Lawrence river, Leeds county, Ont. (Not Guide.)

**Dewdney**; mount, Porcupine river, Yukon.

**Dezadeash**; lake, and river tributary to the Alsek, southwestern Yukon.

*Dez Amecane.* See Azatika.

**Diable** (cap au); cape, western entrance to Kamouraska bay, Kamouraska Co., Que.

**Diamond**; island, west of Jubilee island, north shore of Hudson strait, N.W.T.

**Diamond**; lake, Herschel township, Hastings county, Ont.

**Diana**; bay, west of Cape Hopes Advance, Hudson strait, New Quebec.

**Dibble**; creek, tributary to Bull river, Kootenay district, B.C.

**Dickey**; lake, Lake township, Hastings county, Ont. (Not Dickey's.)

**Dickinson Landing**; village, Stormont county, Ont. (Not Dickenson's Landing nor Dickinson's Landing.)

**Dickson**; hill, south of Wheaton river, southern Yukon.

**Dinghy**; island, between Barge and Deathdealer islands, Lake Fleet group, St. Lawrence river, Leeds county, Ont. (Not 34g.)

**Dinorwic**; lake and hamlet, Kenora district, Ont. (Not Little Wabigoon.)

**Dion**; creek, tributary to Yukon river, near Dawson, Yukon.

*Dirt.* See Chip.

*Dirtywater.* See Houghton.

*Discousse.* See D'Escousse.

**Discovery**; lake, east of Minnitaki lake, Kenora district, Ont.

*Discovery.* See Plumber.

**Disella**; lake, south of Chismaina lake, Cassiar district, B.C.

**Dispatch**; island, in Columbia river, near south end of Upper Arrow lake, Kootenay district, B.C. (Not Despatch.)

**Distingué**; mount, at headwaters of Skeena river, Cassiar district, B.C. (Not Table.)

**Division**; mountain, east of Nordenskiöld river, southern Yukon.

**Dixie**; mount, also lake, east of Atlin lake, Cassiar district, B.C.

*Dixie.* See O'Donnel.

**Dixon**; lake, Limerick township, Hastings county, Ont. (Not Dixon's.)

**Dixon Corners**; village, Dundas county, Ont. (Not Dixon's Corners.)

**Dobbs**; island, N. of Gordon island, St. Lawrence R., Leeds county, Ont. (Not Hay.)

**Doctor**; creek, flowing northeasterly into Findlay creek, Kootenay district, B.C. (Not Middle Fork of Findlay creek.)

**Doctor**; island, between Russell island and Tobermory harbour, at entrance to Georgian bay, Bruce county, Ont.

**Doctor**; island, S.E. of Tar island, St. Lawrence R., Leeds Co., Ont. (Not Doctor's.)

**Doctor**; island, south shore of Hudson strait, N.W.T.

**Doctor**; lake, on Churchill river, Sask.

**Dodd**; narrows, between Mudge and Vancouver islands, B.C.

**Dodge**; cove, W. of Parizeau Pt., Digby I., Prince Rupert harbour, Coast district, B.C.

**Dodge**; island, north of Parizeau point, Prince Rupert harbour, Coast district, B.C.

**Dog**; island, also Dog Island lightstation, opposite Seal cove, north shore of Lennox

passage, Richmond county, N.S. (Not Seal.)

**Doghead**; point, the northeastern point of entrance to the narrows of lake Winnipeg, Man. (Not East Doghead.)

**Dognose**; creek, tributary to Klondike river, Yukon.

*Dog's Head.* See Whiteway.

**Dogtooth**; mountains, Selkirk range, Kootenay district, B.C.

**Dokdaon**; creek, tributary to Stikine R., near Clearwater R., Cassiar district, B.C.

**Dokis**; island, at entrance to Key harbour, Georgian bay, Parry Sound district, Ont.

**Dollis**; creek, tributary to Tatshenshini river, southwestern Yukon.

**Dolly Varden**; mountain, east of Wilson creek, Kootenay district, B.C.

**Dolomite**; lake, south of Reed lake, Manitoba. (Not Limestone.)

**Dolomite**; pass, peak and stream, Rocky mountains, Alberta.

**Dombourg**; islet, in St. Lawrence river, near Pointe-aux-Trembles, Portneuf county, Que. (Not Donbour nor Frechette.)

**Dome**; mountain, near lake Evans, Abitibi territory, Que.

**Dome**; mountain, west of Cudahy, near international boundary, Yukon.

**Dominick**; lake, Rugby township, Kenora district, Ont. (Not Dominic.)

**Dominion**; bay and point, south shore of Manitoulin island, Manitoulin district, Ont.

**Dominion**; creek, tributary to Indian river, Yukon.

**Don**; lake, west of Favel lake, Kenora district, Ont.

**Don**; river, flowing into lake Ontario, York county, Ont. (Not West Branch of Don river.)

*Don.* See Little Don.

*Donald.* See McDonald.

**Donaldson**; island, east of Sooke inlet, Vancouver island, B.C. (Not Secretary.)

*Donbour.* See Dombourg.

**Dondaine**; islands, St. Lawrence river, near Valleyfield, Soulanges county, Que. (Not Soulanges.)

**Donjek**; river, tributary to White river, Yukon.

**Donkin**; mount, also glacier and pass, southeast of mount Bonney, Selkirk Mts., Kootenay district, B.C.

*Doobaunt.* See Dubawnt.

**D'Or**; cape, Cumberland county, N.S. (Not Dore nor D'Ore.)

**Dorcas**; bay, east shore of lake Huron, Bruce county, Ont.

**Doré** (baie du); bay, Bruce county, Ont.

*Dore.* See D'Or.

*Dorion.* See Vaudreuil.

**Dorothy**; island and narrows, Devastation channel, Coast district, B.C.

**Dotty**; lake, Finlayson township, Nipissing district, Ont. (Not Dotty's.)

*Double.* See Brandon.

**Douglas**; channel, between Hawkesbury island and the mainland, Coast district, B.C.

**Douglas**; creek, southwest of Banff, Alberta.

**Douglas**; harbour, King George sound, Hudson strait, New Quebec.

**Douglas**; lake, east of mount Douglas, Rocky mountains, Alberta.

**Douglas**; mount, at headwaters of Red Deer river, Rocky mountains, Alberta.

**Douglas**; mount, north of Victoria, B.C.

**Douglas**; point, Bruce county, Ont.

**Douglas**; point, E. entrance Melville arm, Prince Rupert harbour, Coast district, B.C.

*Douglas.* See Protection.

*Dover.* See Taylor.

**Dover East**; township, Kent county, Ont. (Not East Dover.)

*Dover South.* See Paincourt.

*Dowker.* See Lynch.

**Dowling**; lake, south of Sullivan lake, southern Alberta.

**Downey**; bay, Ottawa river, Sheen township, Pontiac county, Que. (Not Armstrong nor Downey's.)

**Downie**; island, Navy group, St. Lawrence river, Leeds county, Ont. (Not Float.)

**Doyle**; island, Blind bay, Halifax county, N.S. (Not Doyle's.)

**Dozois**; lake, east of Grand lake Victoria, Pontiac county, Que. (Not Birch.)

**Drag**; lake, Dudley township, Haliburton county, Ont.

**Drewry**; lake, Haycock township, Kenora district, Ont.

**Driedmeat**; hill and lake, on Battle river, eastern Alberta. (Not Dried Meat.)

**Drifting**; river, tributary to Valley river, western Manitoba.

**Driftpile**; river, flowing northerly into Lesser Slave lake, central Alberta.

**Driftwood**; creek, flowing westerly into Bulkley river, Coast district, B.C.

**Dromedary**; island, N.E. of Grenadier I., St. Lawrence R., Leeds Co., Ont. (Not Pear.)

**Drumming**; point, northeast extreme of Black island, lake Winnipeg, Man.

**Drummond**; mount, at headwaters of Red Deer river, Rocky Mountains park, Alta.

**Dryad**; point, northeastern portion of Campbell island, Seaforth channel, Coast district, B.C. (Not Turn.)

**Dryberry**; lake, northeast of Berry lake, Kenora district, Ont.

**Dryden**; village, Kenora district, Ont.

**Dubawnt**; lake and river, N.W.T. (Not Doobaunt.)

**Duchesnay**; mount, also lake and pass, Rocky mountains, Kootenay district, B.C.

**Duck**; lake, southeast of Carlton, central Saskatchewan.

**Duck**; mountain, also Duck Mountain Forest reserve, western Manitoba.

*Duck.* See Sisipuk.

**Duckie**; lake, northwest of Chismaina lake, Cassiar district, B.C.

**Duck Lake**; Indian reserve and village, southeast of Carlton, Sask.

*Duck River North.* See North Duck river.

*Duck River South.* See South Duck river.

**Dudidontu**; river, tributary to Inklin river, Cassiar district, B.C.

**Dufault**; lake, Dufresnoy township, Timiskaming Co., Que. (Not Lake of Islands.)

**Dufay**; lake, east of Hébert lake, Dufay township, Timiskaming county, Que. (Not Rest.)

**Duffin**; creek, flowing into lake Ontario, Ontario county, Ont. (Not Duffins.)

**Duffin**; passage, between Felice island and Low peninsula, Clayoquot sound, Vancouver island, B.C.

**Dufresnoy**; lake, Destor and Dufresnoy townships, Timiskaming county, Que. (Not Kajakanikamak.) Previous decision revised.

**Duke**; point, Northumberland channel, strait of Georgia, New Westminster district, B.C.

**Dumais**; islet, northern of 3 rocky islets in the St. Lawrence, off St. Germain, Kamouraska county, Que.

**Dumfounder**; island, Lake Fleet group, St. Lawrence river, Leeds county, Ont.

**Dumoine**; lake and river, Timiskaming county, Que. (Not Du Moine, Big, nor Grand.)

**Dunbar**; creek, flowing northeasterly into Templeton river, Kootenay district, B.C. (Not South Fork of Salmon river.)

**Duncan**; mount, also glacier, east of Beaver Mt., Selkirk range, Kootenay district, B.C.

**Duncan**; lake and river, emptying into the north end of Kootenay lake, Kootenay district, B.C. (Not Howser lake nor Upper Kootenay lake.)

**Duncan**; village, Vancouver island, B.C. (Not Duncan's nor Duncan's Station.)

**Dundalk**; mount, also creek and railway station, on east side of Bennett lake, Yukon.

**Dundas**; islands, western side of Chatham sound, Coast district, B.C.

**Dundas**; point, on northeast coast of Digby island, Coast district, B.C.

**Dunn**; island, near Pearson island, Manitoulin district, Ont. (Not Grant.)

**Dunsekikan**; island, lake St. Martin, Man.

**Dunsmuir**; islands, Ladysmith harbour, Vancouver island, B.C. (Not Twin.)

**Dunvegan**; a post of the H.B. Co., on Peace river, Alberta. (Not Fort Dunvegan.)

**Duparquet**; lake, Duparquet and Hébécourt townships, Timiskaming county, Que. (Not Agotawekami.) Previous decision revised.

**Duplex**; mountain, south of Lyell creek, Rocky mountains, Alberta.

**Dutch**; creek, flowing easterly into Columbia river at its source, Kootenay district, B.C.

**Dutch**; creek, flowing easterly into Oldman river, southern Alberta.

**Du Vernet**; point, on northeast coast of Digby island, Coast district, B.C.

**Dwyerhill**; hamlet, Carleton county, Ont. (Not Dwyer Hill.)

*Dyer*. See Waddell.

**Dyke**; head, on south shore of Hudson strait, New Quebec.

**Dyment**; railway station, Kenora district, Ont.

**Dyson**; creek, tributary to Sheep river, also mountain, southern Alberta.

## E

**Eabemet**; lake and river, tributary to Albany river, Patricia district, Ont.

**Eagle**; bay, at the south end of Grand lake Victoria, Timiskaming county, Que.

**Eagle**; cape, above St. Fidèle, Charlevoix county, Que.

**Eagle**; cove and point, Cove island, at entrance to Georgian bay, Ont.

**Eagle**; creek, tributary to Yukon river, international boundary, Yukon.

**Eagle**; glacier and peak, Selkirk mountains, also pass and river west of Revelstoke, Kootenay district, B.C.

**Eagle**; hills, southwest of Battleford, Sask.

**Eagle**; lake, railway station, and river, Kenora district, Ont.

**Eagle**; lake, southeast of Tatla lake, Coast district, B.C.

**Eagle**; river, tributary to Denso river, Cassiar district, B.C.

*Eagle.* See Aigles.

*Eagle.* See Anstruther.

*Eagle.* See Kiyiu.

*Eagle.* See Murphy.

*Eagle.* See Sakwatamau.

*Eagle.* See Sheridan.

**Eagle Crag**; mountain, near confluence of Iskut and Stikine rivers, Cassiar district, B.C.

**Eaglehill**; creek, flowing from Tramping lake, to the North Saskatchewan in Tp. 39, R. 10, W. 3 M., southern Sask. (Not Eagle nor Eagle Hill.)

**Eaglenest**; hamlet, Brant Co., Ont. (Not Eagle Nest, Eagles Nest nor Eagle's Nest.)

**Eaglenest**; lake, south of Birch mountain, Alberta. (Not Eagle Nest.)

**Eagle Nest**; mountain, on lower Lewes river, below Little Salmon river, Yukon.

**Eagle Rock**; lake, northeast of Kaopskikamak lake, Kenora district, Ont.

**Ealue**; lake, a source of Iskut river, between Kinaskan lake and Klappan river, Cassiar district, B.C. (Not Eahlueh.)

**Eamer**; village, Stormont county, Ont. (Not Eamer's Corners.)

**Ear**; lake, northwest of Tramping lake, Sask.

**Earl Grey**; pass, in the summit range of the Selkirks, between Hammill and Toby creeks, Kootenay district, B.C.

**Earl Grey**; river, emptying into lake Aylmer, northeast of Great Slave lake, N.W.T. (Not Earl Grey's.)

**Earl Patches**; shoals, S. of Russel I., entrance to Georgian bay, Bruce county, Ont.

**Earn**; river, tributary to Pelly river, north of Glenlyon mountains, Yukon.

**East**; bluff, west of Gabriel strait, N.W.T. (Not Innarulligang.)

**East**; channel, one of the outlets of lake Winnipeg, Man. (Not East river.)

**East**; lake, Harburn township, Haliburton county, Ont.

**East**; river, Bonaventure county, Que. (Not East Port Daniel river.)

**East**; river, Pictou county, N.S. (Not East river of Pictou.)

**East Arrowwood**; river, tributary to Bow river, Alberta. (Not East Arrow Wood.)

*East Belanger.* See Girouard.

*East Branch of Athabaska R.* See Sunwapta.

*East Branch of North Fork (Kettle river).* See Burrell creek.

*East Branch of Thessalon R.* See Bridgland.

*East Caledon.* See Caledon East.

*East Chimney Island* (shoals). See Griswold.

*East Doghead.* See Doghead.

*East Dover.* See Dover East.

**Eastern Harbour**; village, on Cheticamp harbour, Inverness county, N.S. (Not Cheticamp Harbour village.)

*Eastern.* See Cheticamp.

*East Flamboro.* See Flamboro East.

*E. Fork of W. Fork Kettle R.* See Trapper creek.

**Eastmain**; river, emptying into James bay, Que. (Not East Main.)

*Eastman's Springs.* See Carlsbad Springs.

**Easton**; post village, Grenville county, Ont. (Not Easton's Corners.)

*Easton's Corners.* See Easton.

*East.* See Quebec.

*East Port Daniel.* See East.

**East Sister**; shoal, S. of Yeo I., entrance to Georgian bay, Manitoulin district, Ont.

*East Souris.* See Souris.

*Eatchepashi.* See Etchipotchi.

**Eau Dorée** (rivière à l'); river, tributary to Moisie river, Saguenay county, Que. (Not Takameshau.)

**Ebb-and-flow**; lake, W. of the narrows of L. Manitoba, Man. (Not Ebb and Flow.)

*Ecapo.* See Ekapo.

*Echafaud.* See Pouce-Coupé.

**Echimamish**; river, tributary to the east branch of Nelson river, Manitoba. (Not Echamamish nor Echiamamish.)

**Echo**; island, east of Cove island, at entrance to Georgian bay, Bruce county, Ont.

**Echo**; lake, an expansion of Qu'Appelle river above Lebret lake, Sask., in the chain of the "Fishing lakes."

**Ecstall**; river, flowing into the Skeena at Essington, Coast district, B.C. (Not Hockstall, Huckstall, Huxstall nor Oxstall.)

*Ecstew.* See Exstew.

**Eddy**; railway station, north shore of Skeena river, Coast district, B.C.

*Eddy's Mills.* See Edy Mills.

**Edgar**; lake, south of Taku arm, Tagish lake, Cassiar district, B.C.

**Edgar**; settlement, Essex county, Ont. (Not Edgar's Mills.)

*Edgar's Mills.* See Edgar.

**Edgell**; banks, Nanoose harbour, east coast of Vancouver island, B.C.

**Edgell**; island, in Blunden harbour, Queen Charlotte sound, Coast district, B.C.

**Edgett**; cape, near Edgett landing, Albert county, N.B. (Not Big.)

**Edith**; lake and river, Big island, Hudson strait, N.W.T.

**Edith**; mount, west of the north end of lake Laberge, Yukon.

*Edith.* See Bailey.

**Edmonton**; capital city of Alberta. (Not Fort Edmonton.)

**Edmund**; mount, northwest of Surprise lake, Cassiar district, B.C.

**Edmund**; rock, off Commerell point, northwest coast of Vancouver island, B.C.

**Edna**; point, forms eastern boundary of Christina bay, Manitoulin I., L. Huron, Ont.

**Eduni**; mountain, Gravel river, N.W.T.

**Edward**; island, and harbour in the southwest portion of the island, south of entrance to Black bay, Thunder Bay district, Ont.

**Edward**; lake, Smellie township, Kenora district, Ont.

**Edward**; point, at the entrance to St. Clair river, Lambton county, Ont.

**Edy Mills**; hamlet, Lambton county, Ont. (Not Eddy's, Eddy's Mills, nor Edy's Mills.)

**Eel**; lake, southwest of Opasatika lake, Timiskaming county, Que.

*Eel.* See Pontleroy.

**Eels**; lake, Cardiff township, Haliburton county, Ont. (Not Eel.)

**Effingham**; island, inlet, and port on the island, Barkley sound, B.C.

**Effingham**; lake, Effingham Tp., Addington Co., Ont. (Not Little Weslemcoon.)

*E. F. Wilson.* See Dennis.

**Egan**; brook and lake, tributary to York R., Hastings Co., Ont. (Not Jamieson's.)

*Egg.* See Scotch Bonnet.

**Eglinton**; post office, York county, Ont. (Not Eglington.)

**Egnell**; creek, mountain and telegraph station, Shesly river, Cassiar district, B.C. (Not Egnelle nor Egnell's.)

**Ego**; mountain, north of Lyell creek, Rocky mountains, Alberta.

*Egypt.* See Macdonald.

*Ehkwee.* See Ekwi.

**Eider**; islands, west coast Ungava bay, N.W.T.

**Eiffel**; peak, south of Pinnacle mountain, Rocky mountains, Alberta.

*Eighteen Mile.* See Cahill.

*Eighteen-mile.* See Stirling.

*Eightmile.* See Tatsho.

**Eins**; lake, east of Tramping lake, Saskatchewan.

**Eisner**; cove, Halifax har., Halifax Co., N.S. (Not Isnor, Eisenhaur, nor Eisenhauer.)

**Ekapo**; lake, east of Weed hills, southeastern Saskatchewan. (Not Ecapo.)

**Ekwan**; river emptying into James bay, Patricia district, Ont. (Not Equan.)

**Ekwi**; river, tributary to Gravel river, N.W.T. (Not Ehkwee.)

**Elbow**; lake, northeast of Humboldt bay, L. Nipigon, Thunder Bay district, Ont.

**Elbow**; lake, north of Stranger lake, Kenora district, Ont.

**Elbow**; lake, on Grass river, northwest of Reed lake, Manitoba. (Not Ithenotosquan nor The Elbow.)

**Elbow**; mountain, at bend in lower part of Stikine river, Cassiar district, B.C.

**Elbow**; river, tributary to Bow river, Alberta.

**Elderbank**; village, Halifax county, N.S. (Not Little Musquodoboit nor Little River Musquodoboit.) Previous decision revised.

**Elder Mills**; village, York Co., Ont. (Not Elder nor Elder's Mills.)

**Eldorado**; creek, tributary to Bonanza creek, Yukon.

**Eliot**; passage, between Indian islands and Village island, at south entrance to Knight inlet, Coast district, B.C. (Not Elliot.)

**Elizabeth**; bay, in southern portion of Olga lake, Abitibi territory, Que.

**Elizabeth**; lake, Purdom township, Thunder Bay district, Ont. (Not Sharp Mountain lake.)

**Elizabeth**; point, N. of Parizeau Pt., W. side Prince Rupert harbour, Coast dist., B.C.

**Elk**; mountains and river, southern Alberta, and Kootenay district, B.C.

**Elk**; river, tributary to Kootenay river, Kootenay district, B.C.

**Elkwater**; lake, Tp. 8, R. 3, W. 4th M., Alberta.

**Ella**; island, north of Leach island, Manitoulin district, Ont. (Not Gull.)

**Ellesmere**; island, includes the whole of the insular tract lying between latitude 76° and 84° N. and longitude 62° and 90° W.; portions of which have been named "Arthur land," "Ellesmere land," "Grant land," "Grinnell land," "Jesup land," "King Oscar land," "North Lincoln," "Schley land," etc.

**Ellinor**; rock, east of Kinahan islands, southwest of entrance to Prince Rupert harbour, Coast district, B.C.

**Elliott**; peak, north of North Saskatchewan, opposite the confluence of the North Saskatchewan and Siffleur rivers, Alberta.

**Elmtree**; post village and river, Gloucester county, N.B. (Not Elm Tree.)

**Embarras**; river, tributary to McLeod river, central Alberta.

**Embrun**; village, Russell county, Ont.

**Emerald**; lake, peak and river, northwest of Field, Kootenay district, B.C.

*Emerald.* See Louise.

*Emerald.* See President.

**Emil**; creek, tributary to Nello river, Klondike river, Yukon.

**Emilia**; island, Douglas channel, west of Maitland island, Coast district, B.C.

**Emily Maxwell**; reef, south of Fitzwilliam island, Manitoulin district, Ont.

**Emma**; island, northwest of Big island, Hudson strait, N.W.T. (Not High.)

**Emma**; lake, on Nipigon river, Thunder Bay district, Ont.

**Emmerson**; point, west side of Prince Rupert harbour, Coast district, B.C.

**Empress**; mountain, east of Sooke R., Vancouver I., B.C. (Not Conspicuous peak.)

**Emulous**; reef, off Ram I., Lockeport harbour, Shelburne Co., N.S. (Not Emulow.)

**End**; mountain, south of the south fork of Ghost river, Rocky mountains, Alberta.

**Endako**; river, tributary to Stellako river, north of François lake, Coast district, B.C.

**Endikai**; lake, N.E. of Grasett Tp., Algoma district, Ont. (Not Endikai-a-go-ming.)

**Endymion**; island, Lake Fleet grp., St. Lawrence R., Leeds Co., Ont. (Not Endymian.)

**English**; portage, Pigeon river, above Grand portage, international boundary, Thunder Bay district, Ont.

**English**; river, rising near English River station, C.P.R., and flowing northward to L. Seul, and thence westward to its confluence with Winnipeg river, Kenora and Patricia districts, Ont.

*English.* See Churchill.

**Englishman**; lake and river, tributary to North Saskatchewan river, central Saskatchewan.

**Ennett**; village, Kent county, Ont. (Not Turnerville.)

**Ennis**; mount, east of mount Vaux, Rocky mountains, Kootenay district, B.C.

**Ennishone**; settlement, Victoria county, N.B. (Not Ennishore.)

*Ennishore.* See Ennishone.

**Enrage**; cape, Chignecto bay, N.B. (Not Enragé.)

**Ensley**; creek, tributary to Yukon river, north of Indian river, Yukon.

**Entrance**; island, off Berry point, Gabriola island, S.E. coast of Vancouver I., B.C.

**Epaule** (rivière à l'); river, Tewkesbury township, Quebec county, Que.

*Equan* See Ekwan.

**Erickson**; creek, railway station and ridge, east of Michel, Kootenay district, B.C.

**Erskine**; mount, Saltspring island, southeast coast of Vancouver island, B.C.

*Eschaillons.* See Deschaillons.

**Escoumains**; bay, parish, river and township, Saguenay county, Que. (Not Escoumins.)

**Eskimo**; bay, islands and river, west of the strait of Belleisle, Saguenay county, Que. (Not Esquimaux.)

**Eskimo**; island, one of the Mingan group, Saguenay county, Que. (Not Esquimaux.)

**Eskwahani**; lake, near the headwaters of Ottawa river, Berthier and Joliette counties, Que. (Not Askwahani.)

**Eskwanonwatin**; lake, on Black Sturgeon river, south of lake Nipigon, Thunder Bay district, Ont. (Not Esquanonwatin.)

**Esplanade**; range of mountains in the Selkirks, Kootenay district, B.C.

**Espoir** (cap d'); cape, entrance of Chaleur bay, Gaspe, Que. (Not Despair.)

*Esquanonwatin.* See Eskwanonwatin.

*Esquimaux.* See Eskimo.

**Essington**; town, at mouth of Skeena river, Coast district, B.C. (Not Port Essington.)

*Etang.* See L'Etang.

**Etchipotchi**; river, tributary to Waswanipi river, Abitibi territory, Que. (Not Eatchepashi.)

**Ethel**; lake, Redditt township, Kenora district, Ont.

**Ethel**; lake, south of Mayo brook, Stewart river, Yukon.

*Etoimami.* See Etomami.

*Etoimami South.* See Lilian.

**Etomami**; lake and river, tributary to Red Deer river, eastern Saskatchewan. (Not Etoimami nor Etoimami North.)

*Etsi-kom.* See Etzikom.

**Etta**; point, western extremity of Maurelle island, Coast district, B.C.

**Ettrain**; creek, tributary to Nation river, international boundary, Yukon.

**Etzikom**; coulée, north of Milk river, southern Alberta. (Not Etsi-kom.)

**Eulatazella**; creek and lake, south of Nechako river, Cariboo district, B.C.

**Eureka**; creek, tributary to Indian river, Yukon.

**Eva**; lake, near National Transcontinental railway, eastern portion of Kenora district, Ont. (Not Wigwas.)

**Eva**; point, Devastation channel, Coast district, B.C.

**Evain**; lake, Montbeillard township, Timiskaming county, Que. (Not Kaishk.)

**Evans**; creek, west of Slocan lake, Kootenay district, B.C.

**Evans**; lake, in northern part of Abitibi territory, Que.

**Evelyn**; island, east of Warren island, Bruce county, Ont. (Not Birch.)

**Evening**; lake, southwest of Cliff lake, Kenora district, Ont.

**Everest**; island, Brock group, St. Lawrence river, Leeds county, Ont. (Not Sumach.)

**Everett**; reefs, at entrance to Timber bay, Manitoulin island, Manitoulin district, Ont.

**Ewing**; mount, west of Gladys lake, Cassiar district, B.C.

*Execution.* See Gallows.

**Expanse**; lake, an expansion of the upper Ottawa river, Timiskaming county, Que.

**Exstew**; Ry. sta., also river tributary to Skeena R., Coast district, B.C. (Not Ecstew.)

**Extension**; post office, west of South Wellington, Vancouver island, B.C.

**Eyebrow**; hills, lake and post office, southern Saskatchewan.

**Eyehill**; creek, flowing into Manito lake, Alberta and Saskatchewan. (Not Eye Hill.)

## F

**Fagan**; ground, S.W. of Yeo I., entrance of Georgian bay, Manitoulin district, Ont.

**Fairfield**; bluff, on Yukon river, below Cudahy, Yukon.

**Fairfield**; village, Leeds county, Ont. (Not Fairfield East.)

**Fairfield**; railway station, east of London, Middlesex county, Ont.

*Fairfield East.* See Fairfield.

**Fairford**; river, between Manitoba and St. Martin lakes, Man.

**Fairground**; hamlet, Norfolk county, Ont. (Not Fair Ground nor Fair Grounds.)

**Fairholme**; mountains, north of Bow river, Rocky Mountains park, Alberta.

**Fair Ness**; headland, at entrance to Markham bay, Hudson strait, N.W.T.

**Fairview**; mountain, south of lake Louise, Alberta. (Not Goat.)

**Fairview**; point, W. coast of Kaien island, Prince Rupert harbour, Coast district, B.C.

**Fairway**; channel, northwest of Gabriola island, southeast coast of Vancouver I., B.C.

**Fairy**; lake, east of Kejimkujik lake, Queens county, N.S.

*Fairy.* See Mamakwash.

**Falcon**; rock, at entrance to Prince Rupert harbour, Coast district, B.C.

*Fall.* See Tortue.

**Falls**; creek, west of Slocan lake, Kootenay district, B.C.

**False**; narrows, between Gabriola and Mudge islands, S.E. coast of Vancouver I., B.C.

**False Detour**; channel, between Cockburn and Drummond islands, Manitoulin district, Ont. The international boundary passes through the channel.

**False Ducks**; islands (2), at the south entrance to Prince Edward bay, L. Ontario, Prince Edward county, Ont. The distinctive names of these islands are "Swetman" for the eastern and "Timber" for the western.

**Fantail**; lake and river, west of Taku arm, Tagish lake, Cassiar district, B.C. (Not Otter.)

**Farewell**; cape, at the south end of Promise island, Coast district, B.C.

**Farnam Corners**; settlement, Missisquoi county, Que. (Not Farnam's Corners.)

**Farnham**; mount, northwest of Mt. Nelson, Kootenay district, B.C.

**Farnsworth**; mount, east of O'Donnel river, Cassiar district, B.C.

**Farquart**; lake, Harcourt township, Haliburton county, Ont.

**Farr**; creek, emptying into northerly part of lake Timiskaming, Ont.

**Farran Point**; village, Dundas county, Ont. (Not Farran's Point.)

**Farrell**; lake, Rosebud district, Alberta. (Not Long.)

**Farrier**; river, flowing southeasterly into Primrose lake, central Alta. and Sask.

**Fatigue**; mountain, north of Mt. Assiniboine, Rocky Mountains park, Alberta.

**Faucher**; lake, Varsan township, Timiskaming county, Que. (Not Asapikona.)

**Favel**; lake, northeast of Silver lake, Kenora district, Ont.

**Favourable**; lake, southeast of Island lake, Patricia district, Ont.

**Fawcett**; lake, southeast of Williams bay, L. Seul, Kenora district, Ont.

**Fawcett**; lake and river, tributary to Lesser Slave river, central Alberta. (Not Moose.)

**Fawn**; river, tributary to Severn river, Patricia district, Ont.

*Fawn.* See Woodtick.

**Fay**; mount, Bow range of the Rockies, Alta., and Kootenay district, B.C.

**Fay**; river, tributary to Klondike river, Yukon.

**Felice**; island, between Low peninsula and Stubbs island, Clayoquot sound, Vancouver island, B.C. (Not Round.)

**Felucca**; mountain, east of Blackwater range of the Rockies, Kootenay district, B.C.

**Fenwick**; creek, tributary to Wheaton river, southern Yukon.

**Ferguson**; creek, flowing into Lardeau creek at Ferguson, Kootenay district, B.C. (Not North Fork of Lardeau creek.)

**Ferguson**; point, on northerly side of Wolfe island, Frontenac county, Ont. (Not Pearson's nor Spardan.)

*Ferguson*. See Barrett.

**Ferguson Falls**; village, Lanark county, Ont. (Not Ferguson's Falls.)

**Fergusson**; creek, flowing northwesterly from mount Fergusson to Bridge river, Lillooet district, B.C. (Not Sucker.)

**Fergusson**; mount, the highest point in the ridge to the northeast of the junction of Cadwallader creek with Hurley river, Lillooet district, B.C.

**Ferme** (île de la); islet, St. Lawrence river, opposite St. Germain, Kamouraska county, Que.

**Fern**; passage, east and south of Kaien island, connecting upper portion of Prince Rupert harbour with Chatham sound, Coast district, B.C.

**Fernie**; mountain ridge, also town, Kootenay district, B.C.

**Ferro**; pass, between the headwaters of Mitchell river and Surprise creek, Kootenay district, B.C.

**Ferroux**; creek and mountain, north of Carmi, Similkameen district, B.C.

**Feuz**; a peak of mount Dawson, Selkirk mountains, Kootenay district, B.C.

**Fèves** (rivière des); river, Chateauguay county, Que.

**Fiddlers Elbow**; channel, between Lynedoch and Wallace islands, St. Lawrence river, Leeds county, Ont.

**Field**; lake, on Ross river, Yukon.

**Field**; mount, and railway station, Kootenay district, B.C.

**Fife**; creek, northwest of Whatshan lake, Kootenay district, B.C.

**Fife**; lake, Tp. 3, Rs. 29 and 30, W. 2 M., Saskatchewan.

*Fifteen Mile* (creek). See Bradshaw.

*Fifteen-mile* (river). See Jennings.

**Fighting**; channel and island, Detroit river, Essex county, Ont.

**Figuery**; lake, Figuery township, Timiskaming county, Que.

**File**; hills, southeastern Saskatchewan.

**File**; lake and river, north of Reed lake, Manitoba.

**File-axe**; lake, on the height of land, southeast of Mistassini lake, Lake St. John county, Que.

**Findlay**; creek, flowing easterly into Kootenay river, south of Columbia lake, Kootenay district, B.C.

**Findlay**; island, north of Bathurst island, Arctic ocean. (Not Finlay land nor King Christian island.) The name "King Christian," which has appeared on some recent maps, was given by Sverdrup, but the island had been previously named for Alexander George Findlay, an eminent cartographer, and publisher of atlases, nautical directories, charts, etc. He was a member of the Council of the Royal Geographical Society for many years.

**Finger**; mountain, west of Bennett lake, Yukon.

**Finlay**; settlement, at the junction of Finlay and Parsnip rivers, Cassiar district, B.C. (Not Finlay Forks nor Finlay Junction.)

*Finlay.* See Findlay.

**Finlayson**; arm, southern portion of Saanich inlet, Vancouver island, B.C.

**Finlayson**; lake and river, near head of Pelly R., Yukon. (Not Tlet-tlan-a-tsoots.)

**Finlayson**; mount, S. of Finlayson arm, Vancouver island, B.C. (Not Leading peak.)

**Fiord**; bay, Separation lake, Kenora district, Ont.

**Fir**; river, tributary to Red Deer river, eastern Saskatchewan.

**Fire**; valley, west of Lower Arrow lake. Kootenay district, B.C.

*First North Fork* (Fitzstubbs creek). See Bremner creek.

*First West Fork* (Wilson creek). See Fitzstubbs creek.

*Fish.* See Arcola.

*Fish.* See Gap.

*Fish.* See Hébert.

*Fish.* See Incomappleux.

*Fish.* See Kerr.

*Fish.* See Mami.

*Fish.* See Murphy.

*Fish.* See Norbury.

**Fishbasket**; river, emptying into Weibikwei lake, Patricia district, Ont.

**Fisher**; bay, northwest of Wakeham bay, Hudson strait, New Quebec.

**Fisher**; bay, northeast of Inner Duck island, Manitoulin district, Ont.

**Fisher**; creek, tributary to Wild Horse river, Kootenay district, B.C.

**Fisher**; creek, tributary to Sheep river, southern Alberta.

**Fisher**: harbour, north of Big island. Hudson strait, N.W.T.

**Fisher**; island, Brock group, St. Lawrence river, Leeds county, Ont.

**Fisher**; lake, east of Dryberry lake, Kenora district, Ont.

**Fisher**; lake, Timiskaming county, Que.

**Fisher**; mount, east of Kootenay river, Kootenay district, B.C.

**Fisher**; peak, southwestern Alberta.

**Fisher**; range of mountains, east of Kananaskis river, southern Alta. (Not Fisher's.)

**Fisher**; river, flowing northeasterly into the bay of the same name, L. Winnipeg, Man.

**Fisherman**; cove, at the north end of Gil island, Coast district, B.C.

**Fishing**; islands, extending from Chiefs point to Pike point, Bruce county, Ont. (Not Ghegheto.)

**Fishing**; lakes (4), expansions of Qu'Appelle river, Sask., the distinctive names being "Qu'Appelle," "Echo," "Lebret" and "Katepwe."

**Fishtail**; lake, Harcourt township, Haliburton county, Ont. (Not Fish Tail.)

**Fitzstubbs**; creek, flowing southeasterly into Wilson creek, Kootenay district, B.C. (Not First West Fork.)

**Fitzwilliam**; channel and island, entrance to Georgian bay, Manitoulin dist., Ont.

**Five-finger**; rapid, in Lewes river, below Nordenskiöld river, Yukon.

*Flag, Flag's or Flagg's cove.* See North Head harbour.

**Flagstaff**; hill, in Tp. 41, R. 11, W. 4 M., eastern Alberta.

**Flamboro Centre**; village, Wentworth county, Ont. (Not Flamborough Centre.)

**Flamboro East**; township, Wentworth county, Ont. (Not East Flamboro nor Flamborough East.)

**Flamboro West**; village and township, Wentworth county, Ont. (Not Flamborough West, West Flamboro nor West Flamborough.)

**Flat**; creek, tributary to Illecillewaet river, Kootenay district, B.C.

**Flat**; creek, tributary to Klondike river, Yukon.

**Flat**; point, east entrance to Sydney harbour, Cape Breton county, N.S. (Not Low.) (To avoid confusion with Low point and Low Point post office, Inverness county.)

*Flat.* See Ridley.

**Flathead**; range of mountains, Alta., and Kootenay district, B.C., also river, Kootenay district, B.C.

**Flatland**; harbour, island and reef, west of Pie island, Thunder Bay district, Ont.

**Fleet**; point, Nanoose harbour, east coast of Vancouver island, B.C.

**Fleming**; island, southeast of Port Dover, Halifax county, N.S. (Not Fleming's.)

**Fleming**; peak, Hermit range of the Selkirks, Kootenay district, B.C.

**Flemming**; brook, tributary to Little R., Gloucester Co., N.B. (Not S. Br. of Little R.)

**Fletcher**; island, in Frobisher bay, N.W.T.

**Fletcher**; lake, in M'Clintock township, Haliburton county, Ont. (Not Fletcher's.)

**Flint**; lake, north of Kakagi lake, Kenora district, Ont.

**Float**; creek, tributary to Ottertail river, Rocky mountains, Kootenay district, B.C.

*Float.* See Downie.

**Florence**; river, tributary to Bell river, Abitibi territory, Que.

**Florence**; river, tributary to Klondike river, Yukon.

**Flowerpot**; island, east of Cove island, at entrance to Georgian bay, Bruce county, Ont. (Not Flower Pot.)

**Fluke**; lake, west of Cliff lake, Kenora district, Ont.

**Foam**; lake, Tps. 31 & 32, R. 12, W. 2 M., southeastern Saskatchewan.

**Foamfall**; river, tributary to Ashuapmuchuan river, Chicoutimi county, Que.

**Fog**; lake, west of Manitou lake, Kenora district, Ont.

**Folden**; settlement, Oxford county, Ont. (Not Folden's Corners.)

*Folden's Corners.* See Folden.

**Folding**; mountain, southeast of Brûlé lake, central Alberta.

**Follé**; mountain, between Watson and Wheaton rivers, southern Yukon.

*Folly.* See Fort Folly.

**Footprint**; lake and river, N. of Threepoint L., Manitoba. (Not Squirrel nor Weir.)

**Forbes**; mount, southeast of Mt. Lyell, Rocky mountains, Alberta.

**Fording**; river, tributary to Elk river, Kootenay district, B.C.

**Foreleg**; bay, in Atikwa lake, Kenora district, Ont. (Not Little Jackfish.)

**Forest**; lake, west of Whitney lake, Kenora district, Ont.

**Foresters**; island, in the bay of Quinte, Prince Edward county, Ont. (Not Captain John's island.)

**Fork**; lake, Tp. 63, R. 11, W. 4 M., eastern Alberta.

**Fork**; river, tributary to Mossy river, south of L. Winnipegosis, Man.

**Forks**; lake, on Churchill R., below Stanley mission, Sask. (Not Rapid River lake.)

*Forks of Credit.* See Credit Forks.

**Forster**; creek, flowing easterly into Columbia river, 8 miles below Athalmer, Kootenay district, B.C. (Not Number 2.)

**Forsyth**; island, Admiralty group, St. Lawrence R., Leeds county, Ont. (Not Quarry.)

*Fort Chimo.* See Chimo.

*Fort Chipewyan.* See Chipewyan.

*Fort Dunvegan.* See Dunvegan.

*Fort Edmonton.* See Edmonton.

**Fort Folly**; point, between Memramcook and Petitcodiac rivers, Westmorland county, N.B. (Not Folly.)

**Fort Frances**; village, on Rainy river, Rainy River district, Ont. (Not Fort Francis.)

*Fort Fraser.* See Fraser.

*Fort Good Hope.* See Good Hope.

*Fort James.* See Fort St. James.

*Fort Lennox.* See Noix.

*Fort McKay.* See McKay.

*Fort Macleod.* See Macleod.

*Fort McMurray.* See McMurray

**Fort Nelson**; river, tributary to Liard river, Peace River district, B.C. (Not Nelson.)

*Fort Norman.* See Norman.

*Fort Providence.* See Providence.

*Fort Resolution.* See Resolution.

**Fortress**; lake, at head of Wood river, also mountain north of the east end of the lake, Rocky mountains, Alberta.

**Fort St. James**; H. B. Co. post, and post office, near the outlet of Stuart lake, Coast district, B.C. (Not Fort James.)

**Fort St. John**; H. B. post, on Peace river, Peace River district, B.C.

*Fort Selkirk.* See Selkirk.

*Fort Severn.* See Severn.

*Fort Simpson.* See Simpson.

**Fort Smith**; H. B. Co. post, and post office on Slave river, northern Alberta.

*Fort Steele.* See Steele.

**Fort Wallace**; island, Lake Fleet group, St. Lawrence river, Leeds county, Ont.

**Fort William**; city, Thunder Bay district, Ont.

*Fort Wrigley.* See Wrigley.

**Fortymile**; river and town, Yukon. (Not Forty Mile.)

**Fossil**; mountain, southwest of mount Douglas, Rocky mountains, Alberta.

*Foster's Harbour.* See Deception.

**Fosthall**; creek, west side of Upper Arrow lake, Kootenay district, B.C.

**Fouquette**; river, flowing into the St. Lawrence, below St. André, Kamouraska county, Que.

**Fourchette**; river, tributary to rivière le Bras, Dorchester and Lévis counties, Que. (Not Brise-culotte.)

**Fourchu**; harbour, Cape Breton county, N.S. (Not Fourché nor Fourchou.)

*Four-mile.* See Lakit.

**Fournier**; post village, Prescott county, Ont. (Not Fournierville.)

**Fowl**; point and portage, international boundary, Thunder Bay district, Ont.

**Fox**; island, in lake Simcoe, York county, Ont. (Not Snake.)

**Fox**; island, Weller bay, Ameliasburg township, Prince Edward county, Ont.

**Fox**; islands, Gordon bay, N.W.T. (Not West Fox.)

**Fox**; land, S.W. portion of Baffin I., N.W.T. (Not Foxe nor Luke Fox.)

**Fox**; mount, also glacier, in the Selkirks, B.C.

*Fox.* See Gordon.

*Foxe.* See Fox.

**Framboise**; village, Richmond county, N.S. (Not Frambois.)

*Français.* See François.

**Frances**; creek, flowing southerly into Förster creek, Kootenay district, B.C. (Not Number 3.)

**Frances**; lake and river, southeastern Yukon.

**Frances Smith**; shoal, entrance to Key harb., Georgian bay, Parry Sound dist., Ont.

**Francis**; island, between Grindstone and Wolfe islands, St. Lawrence river, Frontenac county, Ont. (Not Hickory.)

**Francis**; island, west side of entrance to Ucluelet arm, Barkley sound, Vancouver island, B.C. (Not Round.)

**Francisco**; point, southeast end of Quadra island, Coast district, B.C.

**François**; lake, south of Babine lake, Coast district, B.C. (Not Français.) Reversal of previous decision.

**Frank**; lake, south of N. T. Ry., northeast of L. Nipigon, Thunder Bay district, Ont.

*Frank Clark.* See Clark.

*Franklin.* See Shawanaga.

**Franktown**; village, Lanark county, Ont. (Not Frankstown.)

**Fraser**; lake, Carlow township, Hastings county, Ont. (Not Fraser's.)

**Fraser**; lake, H. B. Co. post and telegraph station, south of Stuart lake, Coast district, B.C. (Not Nalta lake nor Fort Fraser post and station.)

**Fraser**; point, southerly coast of Digby island, Coast district, B.C.

**Fraser**; reach, northeast of Princess Royal island, Coast district, B.C.

**Fraser**; river, central and southern British Columbia.

*Fraser.* See Frazer.

**Fraserville**; town, Temiscouata county, Que. (Not Frazerville.)

**Frazer**; creek and lake, S. of L. Nipigon, Thunder Bay district, Ont. (Not Fraser.)

**Frazer**; island, Becher bay, southern coast of Vancouver island, B.C. (Not Fraser.)

*Frazerville.* See Fraserville.

**Fréchette**; bay, bank and point, near Misery bay, Manitoulin district, Ont.

**Fréchette**; lake, Desandroins and Montbeillard townships, Timiskaming county, Que. (Not Merrill.)

*Fréchette.* See Dombourg.

*Freda.* See Freya.

**Frederick**; lake, Halifax county, N.S. (Not Pine Wood.)

**Frederick**; lake, west of Kusawa lake, southwestern Yukon.

**Frederick**; point, east coast of Digby island, Prince Rupert harbour, Coast district, B.C.

**Frederick**; point, Pittsburgh township, Frontenac county, Ont.

*Freeman's.* See Freemen.

**Freemen**; lake, and river tributary to Athabaska river, Alta. (Not Freeman's.)

*Freestone.* See Gregory.

**Frenchman**; bay, Ontario county, Ont. (Not Pickering harbour.)

**Frenchman**; lake, Tp. 64, R. 10, W. 4 M., eastern Alberta.

**Frenchman**; river, in southern Saskatchewan. (Not White Mud.)

**Freshfield**; mount, north of Blaeberry river, Rocky Mts., Kootenay district, B.C.

**Fresno**; creek, tributary to Yukon river, below Dawson, Yukon.

**Freya**; a spur of the Valhalla mountains, Kootenay district, B.C. (Not Freda.)

**Friday**; creek, branch of Sulphur creek, Indian river, Yukon.

**Friday**; lake, southwest of Lorrain township, Timiskaming district, Ont.

**Frigate**; mountain, N.E. of Blackwater range of the Rockies, Kootenay district, B.C.

**Fritz**; landing, on east side of Lower Arrow lake, Kootenay district, B.C.

**Froatsburn**; village, Dundas county, Ont. (Not Froatburn nor Froathburn.)

**Frobisher**; bay, in S.E. portion of Baffin island, N.W.T. (Not Lumly inlet, &c.)

**Frobisher**; post office and railway station, southeastern Sask. (Not Frobyshire.)

**Frog**; lake, and Frog Lake Indian reserve, eastern Alberta.

**Frontier** (Eng. usage) **Frontière** (Fr. usage); lake, Talon township, Montmagny county, Que.

**Frostfish**; cove, in northeast portion of St. Margaret bay, Halifax county, N.S. (Not Frost Fish.)

**Froude**; bay, northeast of McKim bay, Manitoulin island, Manitoulin district, Ont.

**Fry**; creek, flowing westerly into Kootenay lake, Kootenay district, B.C.

**Fuller**; lake, south of Chemainus, Vancouver island, B.C. (Not Howe.)

## G

**Gabarus**; bay, cape, and P.O., Cape Breton Co., N.S. (Not Gabarous nor Gabarouse.)

**Gaboury**; lake, Bauneville and Vilars townships, Timiskaming county, Que. (Not Little Roger.) Previous decision revised.

**Gabriel**; island, Frobisher bay, N.W.T. (Not Gabriell.)

**Gabriel**; strait, between Resolution I. and mainland, N.W.T. (Not Tudjakdjudusirn.)

**Gabriola**; island, passage, and reefs, east of Nanaimo, B.C.

**Gaetz**; cove, east side of Mahone bay, Lunenburg county, N.S.

*Gage.* See Ninemile.

*Gage.* See Simcoe.

**Gainer**; creek, tributary to Lardeau creek, Kootenay district, B.C.

**Gainsborough**; creek, tributary to Souris R., Manitoba and Sask. (Not North Antler.)

**Gainsborough**; township, Lincoln county, Ont. (Not Gainsboro.)

**Galbraith**; creek, tributary to Bull river, Kootenay district, B.C. (Not West fork of Bull river.)

*Gale.* See Peter.

**Galena**; bay, at north end of Upper Arrow lake, Kootenay district, B.C. (Not Thumb.)

**Galena**; creek, tributary to Yukon river, below Indian river, Yukon.

**Galiano**; island, and gallery near Descanso bay, Gabriola island, strait of Georgia, New Westminster district, B.C. (Not Malaspina's gallery.)

*Galiano.* See Nigei.

**Galloway**; rapids, between Morse and Wainwright basins, southeast of Kaien island, Coast district, B.C.

**Galloway**; settlement, Kent Co., N.B. (Not Galway, New Galway nor New Galloway.)

**Gallows**; point, south extreme of Protection island, southeast coast of Vancouver island, B.C. (Not Execution.)

**Galop**; canal, island and rapids, St. Lawrence river, Dundas county, Ont. (Not Gallop, Gallops, Gallopes, Galoup nor Galloup.)

**Galt**; creek, flowing into Grand river, Waterloo, Wellington and Wentworth counties, Ont. (Not Mill.)

**Galton**; range of mountains, west of Wigwam river, Kootenay district, B.C.

*Galway.* See Galloway.

**Gamskagamik**; lake, south of lake Hill, Kenora district, Ont. (Not Painkiller.)

**Gaotanaga**; lake, west of Grand lake Victoria, Timiskaming county, Que.

**Gap**; creek, tributary to Maple creek, southwestern Saskatchewan. (Not Fish.)

**Garden**; island, N.E. of Du Vernet Pt., Digby I., Prince Rupert harb., Coast dist., B.C.

**Garden**; island, north of Wolfe island, St. Lawrence river, Frontenac county, Ont.

**Garden**; river flowing southeasterly into the North Saskatchewan, in Tp. 49, R. 23, W. 2 M., Sask. (Not Sucker.)

**Garden Island**; lake north of Matchimanito lake, Pontiac county, Que.

**Gardner**; canal, Devastation channel, Coast district, B.C. (Not Gardiner.)

**Garibaldi**; hill, west of Pedder bay, Vancouver island, B.C. (Not North peak.)

**Garnet**; creek, tributary to Dominion creek, Indian river, Yukon.

**Garnet**; mountain, west of mount Goodsir, Rocky mountains, Kootenay district, B.C.

**Garrett**; island, N.W. Lyndoch I., St. Lawrence R., Leeds Co., Ont. (Not Garrett's.)

**Garry**; lake and river, tributary to Delisle R., Glengarry Co., Ont. (Not Black lake.)

**Garson**; lake and river, Alta. and Sask. (Not Swan lake nor Whitefish lake and river.)

**Garthby**; village, and township, Wolfe county, Que. (Not Garthby Station, P.O.)

*Garthby Station.* See Garthby.

**Gasline**; hamlet, Welland county, Ont. (Not Gas Line.)

**Gaspe** (Eng.) **Gaspé** (Fr.); bay, cape, county and town, Que. (Not Gaspa, Gaspee, nor Gaspey.)

*Gaspé.* See Auneuse.

**Gaspereau**; lake, also river tributary to Salmon river, Queens and Sunbury counties, N.B. (Not Gaspereaux.)

**Gaspereau**; river, flowing into baie Verte, Westmorland Co., N.B. (Not Gaspereaux.)

**Gaspesia**; shoal, southeast of Walkhouse point, Manitoulin district, Ont.

**Gat**; point, on western part of Cove I., at entrance to Georgian bay, Bruce county, Ont.

**Gatacre**; point, south shore of Manitoulin island, Manitoulin district, Ont.

**Gates**; island, west of Howe island, St. Lawrence river, Frontenac county, Ont.

**Gateway**; railway station, international boundary, Kootenay district, B.C.

*Gatineau Point* (village). See Pointe-Gatineau.

*Gaudet.* See Grindstone.

**Gaudin**; point, Devastation channel, Coast district, B.C.

**Gauley**; bay, northeast of Greenough point, Bruce county, Ont.

**Gawjewiagwa**; lake, east of Anzhekumming lake, Kenora district, Ont.

**Geikie**; creek and glacier, N. of Dawson glacier, Selkirk Mts., Kootenay district, B.C.

**Geikie**; island, L. Nipigon, Thunder Bay district, Ont. (Not White's.)

**Geikie**; lake, east of lake Evans, Abitibi territory, Que.

**Geikie**; mount, on the watershed of the Rockies, about 18 miles south of Yellowhead pass, interprovincial boundary, Alta., and B.C.

**Gem**; lake, in McGarry township, Timiskaming district, Ont.

**Genesta**; reef, S. of Maiden I., S. shore of Manitoulin I., Manitoulin district, Ont.

**Gens-de-terre**; river, tributary to Gatineau river, Ottawa and Pontiac counties, Que. (Not Jean de Terre.)

**George**; bay and cape, Northumberland strait, Antigonish Co., N.S. (Not St. George.)

**George**; creek, tributary to the south branch of Brazeau river, central Alberta.

**George**; island, Halifax harbour, Halifax county, N.S. (Not Georges nor George's.)

**George**; lake, Prescott county, Ont. (Not Georges nor Georgian.)

**George**; point, at east entrance to Black bay, Thunder Bay district, Ont.

**George**; river, flowing into Ungava bay, New Quebec. (Not Kangerthialuksoak.)

*George.* See Gorge.

*George.* See St. George.

**Georgia**; lake, southeast of lake Nipigon, Thunder Bay district, Ont.

**Georgia**; rock, at entrance to Prince Rupert harbour, Coast district, B.C.

**Georgia**; strait of, between Vancouver island and the mainland, B.C. (Not Gulf of Georgia.)

**Georgian**; bay, the northeastern portion of lake Huron, Ont.

**Georgina**; island, north of Hill island, St. Lawrence river, Leeds county, Ont. (Not Catline nor Deer.)

**Germain**; island, E. of Dokis I., entrance to Key harbour, Parry Sound dist., Ont.

**German Mills**; post village, Waterloo county, Ont. (Not German Mill.)

**Gertrude**; point, Douglas channel, near Kitkiata, Coast district, B C.

*Ghegheto.* See Fishing.

**Ghost**; island, between Jeannette island and the Millar group, North channel, Queen Charlotte sound, Coast district, B.C. (Not Round island.)

**Ghost**; lake, north of Wabigoon lake, Kenora district, Ont.

**Ghost**; river, tributary to Bow river, Alberta.

*Ghost.* See Spirit.

**Ghostpine**; creek, tributary to Red Deer river, Alberta. (Not Devil's Pine.)

**Ghostpine**; lake, Tp. 36, Rs. 24 and 25, W. 4th M., Alberta. (Not Devil's Pine.)

**Gibraltar**; peak, Adamant range, Selkirk mountains, Kootenay district, B.C.

*Gibraltar.* See Harvey.

**Giegerich**; creek, tributary to Duncan river, Kootenay district, B.C. (Not Boulder.)

**Gig**; island, Lake Fleet group, St. Lawrence river, Leeds county, Ont.

**Gil**; island, northwest of Princess Royal island, Coast district, B.C. (Not Gill.)

**Gilbert**; railway station, Kenora district, Ont.

**Gilliam**; mountain, north of Pyramid mountain, southern Yukon.

**Gillies**; lake and railway station, southwest of Cobalt, Ont. (Not Mud lake.)

**Gillis**; creek, tributary to Fry creek, Kootenay district, B.C.

**Gilphie**; reef, off Pine Tree harbour, Bruce county, Ont.

**Gimli**; a peak of the Valhalla mountains, Kootenay district, B.C.

**Girouard**; mount, south of Mt. Inglismaldie, Rocky Mountains park, Alta.

**Girouard**; point, north of Western Duck island and west of Rickley harbour, Manitoulin district, Ont. (Not East Belanger.)

**Giroux**; island, St. Lawrence river, Soulanges county, Que. (Not Dadancour.)

**Giroux**; lake and post office, southeast of Cobalt, Timiskaming district, Ont.

**Giscome**; portage, between Fraser and Crooked rivers, Cariboo district, B.C. (Not Giscomb nor Giscombe.)

**Gizzard**; river, tributary to Bell river, Abitibi territory, Que.

**Glacier**; creek, a branch of Gold creek, Yukon.

**Glacier**; lake, near Howse pass, Rocky mountains, Alberta.

**Glacier**; point, west of Sheringham point, Juan de Fuca strait, Vancouver island, B.C. (Not Point-no-Point.)

*Glacier*. See Peyto.

*Glacier*. See Yoho.

**Glacier Crest**; mountain, Selkirk mountains, Kootenay district, B.C.

**Gladman**; mount, on Yukon river, near the international boundary, Yukon.

**Gladsheim**; a peak of the Valhalla mountains, Kootenay district, B.C.

**Gladstone**; creek, east of Lower Arrow lake, Kootenay district, B.C.

**Gladys**; lake and river, southwest of Teslin lake, Cassiar district, B.C. (Not Sucker lake nor North river.)

**Glaises** (rivière aux); river, flowing into the St. Lawrence, above Pointe-du-Lac, St. Maurice county, Que. (Not Loutres.)

**Glasgow**; island, in North bay, Hudson strait, N.W.T.

**Glenallan**; village, Wellington county, Ont. (Not Glen Allan.)

**Glave**; mount, near upper waters of Chilkat river, Cassiar district, B.C.

**Glenbrook**; hamlet, Glengarry county, Ont. (Not Glen Brook.)

**Glencoe**; island, northwest of Strathcona islands, Hudson strait, N.W.T.

**Glencolin**; village, Elgin county, Ont. (Not Glen Colin.)

**Glenelbe**; hamlet, Leeds county, Ont. (Not Glen Elbe.)

**Glengarry**; point, also Glengarry Point lightstation, opposite lower end of St. Regis island, Glengarry county, Ont. (Not Stonehouse.)

**Glenhuron**; village, Simcoe county, Ont. (Not Glen Huron.)

**Glenlyon**; mountains and river, Pelly river, Yukon.

**Glennevis**; village, Glengarry county, Ont. (Not Glen Nevis.)

**Glenogle**; creek and railway station, Kootenay district, B.C.

**Glenora**; village, on Stikine river, below Telegraph creek, Cassiar district, B.C.

**Glenroy**; post office and railway station, Glengarry county, Ont. (Not Glen Roy.)

**Glensutton**; hamlet, Brome Co., Que. (Not Glen Sutton nor Glenton.)

**Glenwillow**; hamlet, Metcalfe Tp., Middlesex Co., Ont. (Not Glen Willow.)

**Glycerine**; rock, South bay, Manitoulin island, Manitoulin district, Ont.

**Gnat**; creek, tributary to Klondike river, Yukon.

**Gnat**; river, at south end of Kootenay lake, Kootenay district, B.C.

*Goacha.* See Maguasha.

**Goat**; range of mountains, east of Spray river, Rocky Mountains park, Alberta.

*Goat.* See Bow.

*Goat.* See Fairview.

*Goat.* See Table.

*Goat.* See Teresa.

**Goatfell**; railway station, Kootenay district, B.C.

**Gobeil**; island, north of Coste island, Kitimat arm, Coast district, B.C.

**Goble**; hamlet, Oxford county, Ont. (Not Goble's.)

**Godbout**; river, Saguenay county, Que. (Not Godbret nor Goodbout.)

**Goderich**; town, Huron county, Ont.

**Godfroy**; river and seigniory, Nicolet county, Que. Not Godfroi, Godefroi nor Godefroy.)

**Gods**; lake and river, northeast of L. Winnipeg, draining into Hayes R., Manitoba.

**God's Mercie**; islands of, north shore of Hudson strait, N.W.T. This name was also applied at one time to the islands, now known as "Middle Savage."

**Gods Mercy**; bay of, Southampton island, Hudson bay, N.W.T.

**Gold**; creek, flowing into Kootenay river, opposite Flagstone, Kootenay district, B.C.

**Gold**; creek, tributary to Sixtymile river, Yukon.

**Gold**; range of mountains, west of Columbia river, B.C.

**Gold**; river, flowing into Columbia river, above Bush river, Kootenay district, B.C.

**Goldbottom**; creek, branch of Hunker creek, a tributary to Klondike river, Yukon.

**Golden**; creek, branch of Henderson creek, north of Stewart river, Yukon.

**Golden**; valley, southeast of Pike bay, Bruce county, Ont.

**Golden Horn**; mountain, southwest of Lewes river, Yukon.

*Golden Mountain.* See Gowland Mountain.

**Goldfinch**; lake, upper waters of Lièvre river, St. Maurice county, Que.

**Gold-run**; creek, tributary to Dominion creek, Indian river, Yukon.

**Goldsmith**; river, tributary to Driftpile river, central Alberta.

**Goldstream**; glacier, mountain, and névé, west of mount Sir Sandford, also river flowing westerly into Columbia river, Selkirk mountains, Kootenay district, B.C.

**Goldstream**; lakes and river, emptying into Finlayson arm, Vancouver island, B.C.

**Gonzales**; hill and point, east of Victoria, B.C. (Not Shotbolts.)

*Goodbout.* See Godbout.

**Good Hope**; Hudson's Bay Co's. post, at confluence of Hare Indian river and Mackenzie river, N.W.T. (Not Fort Good Hope.)

**Goodsir**; mount, also creek, S.E. of Mt. Vaux, Rocky Mts., Kootenay district, B.C.

**Goodwin**; creek, flowing east into Teslin lake, Cassiar district, B.C.

**Goodwin**; lake, Lorrain township, Timiskaming district, Ont.

**Goose**; cape, below Coudres island, St. Lawrence river, Charlevoix county, Que. French usage: Oies (cap aux).

**Goose**; point, south shore of Manitoulin island, Manitoulin district, Ont.

*Goose.* See Granby.

*Goose.* See Grey Goose.

*Goose.* See Primrose.

*Gooseberry.* See Marjorie.

**Goosehunting**; creek, tributary to Carrot river, Sask. (Not Maple river.)

**Gordon**; bay, west of Chorkbak inlet, Hudson strait, N.W.T. (Not Fox.)

**Gordon**; brook, west of Lower Arrow lake, Kootenay district, B.C.

**Gordon**; island, N. of Lake Fleet group, St. Lawrence R., Leeds Co., Ont. (Not Citron.)

**Gordon**; lake, east of Linklater lake, Kenora district, Ont.

**Gordon**; lake, Tp. 45, R. 10, W. 3 M., Saskatchewan.

**Gordon**; mount, near Stikine river, south of Telegraph creek, Cassiar district, B.C.

**Gordon**; mount, northwest of mount Balfour, Rocky mountains, Alta. and B.C.

**Gorge**; creek, tributary to Deadman river, Kamloops district, B.C. (Not George.)

**Gorge**; creek, tributary to Sheep river, southern Alberta.

**Gorman**; lake, Brudenell township, Renfrew county, Ont.

**Gothics**; group of peaks, Adamant range, Selkirk mountains, Kootenay, B.C.

**Goudron**; river, tributary to Kamouraska river, Kamouraska county, Que.

**Gough**; lake, south of Battle river, Alberta.

**Goulbourn**; hamlet and township, Carleton county, Ont. (Not Goulbourne.)

*Goulbourne.* See St. Helena.

**Gould Dome**; mountain, Tp. 11, R. 15, W. 5 M., southwestern Alberta. (Not Gould's Dome.)

**Goulet**; lake, on Vermilion river, St. Maurice county, Que. (Not Camamableacossa.)

*Gounamitz.* See Gunamitz.

**Gourdeau**; island, north of Swede island, Thunder Bay district, Ont.

**Govan**; brook, Bruce harbour, Hudson strait, N.W.T.

**Gowganda**; lake, mining division and post office, Timiskaming district, Ont. (Not Gow Ganda.)

**Gowland Mountain**; post settlement, Albert county, N.B. (Not Golden Mountain.)

**Grace**; creek, tributary to Fording river, Kootenay district, B.C.

**Grace**; lake, Dudley township, Haliburton county, Ont.

**Grace**; lake, in Skead township, Timiskaming district, Ont.

*Græca.* See Greece Point.

*Graeme.* See Pulteney.

**Graham**; creek, tributary to Souris river, southern Manitoba and Saskatchewan.

**Graham**; creek and inlet, west of Atlin lake, Cassiar district, B.C. (Not Taku inlet.)

**Graham**; mount, Selkirk range, Kootenay district, B.C.

*Graisse (rivière a la).* See Rigaud.

**Gramophone**; creek, flowing into Bulkley R., above Moricetown, Coast district, B.C.

*Grampus.* See Mosher.

**Granby**; point, southern entrance to Granby bay, Observatory inlet, Cassiar district, B.C.

**Granby**; river, flowing southerly into Kettle river at Grand Forks, Similkameen district, B.C. (Not North Fork of Kettle river.)

**Grand**; glacier and mountain, S.E. of Purity range, Selkirk Mts., Kootenay dist., B.C.

**Grand**; point and reef, Brûlé bay, Thunder Bay district, Ont. (Not Brulé.)

*Grand.* See Black.

*Grand* See DeSalaberry.

*Grand.* See Dumoine.

*Grand.* See Kelvin.

*Grand.* See Shubenacadie.

**Grandboro**; village, Shefford county, Que. (Not Grandborough.)

**Grande Anse**; bay, Gaspe county, Que. (Not Grand.)

**Grande-Anse**; village, Gloucester county, N.B. (Not Grand Anse.)

*Grande Batture.* See Leonard.

*Grande Ile aux Erables.* See DeBeaujeu.

**Grande-Prairie**; post settlement, central Alberta.

**Grand-Etang**; town, Inverness county, N.S. (Not Grande Etang.)

**Grand Forks**; town, on Kettle river, Similkameen district, B.C.

*Grand Lac du Commissaire.* See Thirty-one-mile.

*Grand Lake Jacques Cartier.* See Jacques-Cartier.

**Grand lake Victoria**; upper waters of Ottawa river, Pontiac and Timiskaming counties, Que.

**Grand Manan**; island, Charlotte county, N.B. (Not Menan.)

*Grand Manan.* See North Head.

*Grand Manitoulin.* See Manitoulin.

*Grand Rustico.* See North Rustico.

**Grand Valley**; creek, tributary to Bow river, Alberta.

**Granger**; mountain, west of Coal lake, southern Yukon.

**Granite**; creek, flowing into Quiet lake, southeastern Yukon.

**Granite**; creek, tributary to Caribou creek, Kootenay district, B.C.

**Granite**; lake, west of Smoothrock lake, Thunder Bay district, Ont

**Granite**; point, northwesterly extremity of Quadra island, Coast district, B.C.

**Granite**; river, flowing southwesterly into lake of same name on international boundary, Thunder Bay district, Ont.

**Granite Creek**; post office, on creek of same name, S.E. of Tulameen, Yale dist., B.C

**Grant**; peak, Hermit range, Selkirk mountains, Kootenay district, B.C.

**Grant**; point, southwest point of Maitland island, Coast district, B.C.

*Grant.* See Dunn.

**Grant Corners**; village, Glengarry county, Ont. (Not Grant's Corners.)

**Grantham**; shoals, southeast of Todman reef, Manitoulin I., Manitoulin district, Ont.

Grant land. See Ellesmere.

**Granville**; lake, on Churchill river, Manitoba. (Not Grenville.)

**Grape**; island, Muscote bay, N.E. of Huff I., bay of Quinte, Prince Edward Co., Ont.

*Grape.* See Rose.

**Grasett**; township, Algoma district, Ont. (Not Grassett.)

**Grass**; river, tributary to Nelson river, Manitoba.

*Grass.* See Kiskitto.

*Grass.* See Rose.

**Grassberry**; river, flowing southerly into Cumberland lake, central Saskatchewan.

*Grassett.* See Grasett.

*Grassey's Corners.* See Grassie.

**Grasshopper**; mountain, north of Tulameen river, Yale district, B.C.

**Grassie**; village, Lincoln county, Ont. (Not Grassies nor Grassey's Corners.)

**Grassy**; point, in northeastern portion of Sophiasburg Tp., Prince Edward Co., Ont.

*Grassy.* See Bronson.

*Grassy.* See Caldwell.

*Grassy River.* See Stanawan.

**Gratton Corners**; hamlet, Prescott Co., Ont. (Not Gratton Corner nor Gratton's Corner.)

**Grave**; creek, tributary to Elk river, below Fording river, Kootenay district, B.C.

*Grave.* See Wapiabi.

**Gravel**; point, on eastern side of Great Duck island, Manitoulin district, Ont.

**Gravel**; river, tributary to Mackenzie river, N.W.T.

*Gravelly.* See Ostrander.

*Graveyard.* See Allison.

**Gray**; an elevation of ground locally known as "Gray island," on west side of Petitcodiac river, Albert county, N.B. (Not Gray's nor Grey.)

**Gray**; mount, also ridge, north of Bennett lake, Yukon.

**Gray**; strait, at eastern entrance to Hudson strait, New Quebec.

**Grays**; creek, flowing into Crawford bay, Kootenay district, B.C. (Not Greys.)

**Gray Wolf**; mountain, north of the Valhalla mountains, Kootenay district, B.C.

*Great.* See Hamilton.

**Great Bear**; lake and river, Mackenzie, N.W.T. (Not Bear nor Great Bear Lake river.)

*Great Bear.* See Purden.

*Great Bear Sand* (hills). See Wapawekka.

**Great Beaver**; lake, at headwaters of St. Maurice river, Champlain county, Que.

*Great Bishop Roggan.* See Roggan.

*Great Black.* See Hecla.

**Great Bras d'Or**; channel, northwest of Boularderie island, extending to Barra strait from the Atlantic, Cape Breton and Victoria counties, N.S.

*Great Bras d'Or.* See Bras d'Or.

*Great Cataraqui.* See Cataraqui.

**Great Duck**; island, the largest of the Duck Island group, Manitoulin district, Ont.

*Great Fish.* See Backs.

*Great Fish.* See Bridge.

*Great Metis.* See Metis.

*Great New.* See Long.

*Great Opeongo.* See Opeongo.

*Great Shemogue.* See Shemogue.

**Great Slave**; lake, N. W. Territories.

*Great Tusket.* See Tusket.

**Greece Point**; village, Argenteuil Co., Que. (Not Greca Point nor Greece's Point.)

**Green**; creek, branch of Sulphur creek, Indian river, Yukon.

**Green**; island, with lightstation thereon, southeast of Madame island, Richmond county, N.S.

**Green**; lake and river, emptying into west end of Lillooet lake, Lillooet district, B.C.

**Green**; mount, southwest of Ross peak, Selkirk mountains, Kootenay district, B.C.

**Green**; point, Sophiasburg township, Prince Edward county, Ont.

**Green**; point, north of Inner Duck island, Manitoulin district, Ont.

*Green.* See Country.

*Green.* See Pearl.

*Green.* See Tommy.

*Green.* See Victoria.

**Greenan**; lake, Jones township, Renfrew county, Ont. (Not Greenan's.)

**Greenbush**; lake, southeast of lake St. Joseph, Thunder Bay district, Ont.

*Green Cove.* See Port Maitland.

**Greene**; island, N.W. of Western Duck I., Manitoulin district, Ont. (Not Green's.)

**Greene Island**; harbour, Manitoulin island, Manitoulin district, Ont.

**Greenfield**; shoal, S. of Turning island, entrance to Georgian bay, Bruce county, Ont.

**Greenough**; bank, harbour, and point, S.E. of Pine Tree harbour, Bruce county, Ont.

**Green Point**; settlement and railway station, Gloucester county, N.B.

**Greens**; glacier, in the Selkirk mountains, Kootenay district, B.C. (Not Green.)

*Green's.* See Greene.

*Green's.* See Terminal.

**Greenshields**; lake, on Severn river, Patricia district, Ont.

*Green Valley.* See Verte-Vallée.

**Greenwood**; land, at head of Frobisher bay, N.W.T. (Not Greenwood's.)

**Gregg**; creek and lake, between Athabaska and Baptiste rivers, Alta. (Not Lower White Fish.)

**Gregory**; island, northwest of Doctor island, St. Peter inlet, Richmond county, N.S. (Not Freestone islet.)

**Grenadier**; island, in St. Lawrence river, Leeds county, Ont. (Not Bathurst.)

*Grenville.* See Granville.

**Grey**; island, N. of Edward I. and S. of entrance to Black bay, Thunder Bay dist., Ont.

*Grey.* See Gray.

**Grey Goose**; island, opposite mouth of Big river, James bay, N.W.T. (Not Goose.)

*Greys.* See Grays.

**Gribbell**; island, between Ursula channel and Verney passage, Coast district, B.C.

**Grice**; point; N.W. extreme of Low peninsula, Clayoquot sound, Vancouver I., B.C.

**Griffin**; bay, southwest shore of Frobisher bay, N.W.T.

**Griffin**; mount, southwest of Griffin lake, Kamloops district, B.C.

**Griffon**; cove and village, Gaspe county, Que. (Not Griffin, Griffins nor Grifon.)

*Grillage.* See Auneuse.

**Grimross**; islands, in St. John river, Queens county, N.B. (Not Grimrose.)

**Grimsthorpe**; lake, Grimsthorpe township, Hastings county, Ont. (Not Wolf.)

**Grindstone**; creek, tributary to Petitcodiac river, above Upper Dover, Westmorland county, N.B. (Not Gaudet.)

**Grindstone**; island and point, northeast coast of Digby island, Coast district, B.C.

**Grindstone**; lake, Redditt township, Kenora district, Ont.

**Grindstone**; point, east entrance of Washow bay, lake Winnipeg, Manitoba.

**Grinnell**; glacier, southwest shore of Frobisher bay, N.W.T.

**Grinnell**; peninsula, norwestern portion of Devon I., N.W.T. (Not Grinnell Land.)

Grinnell land. See Ellesmere.

**Griswold**; island and shoals, east of Bridge island, St. Lawrence river, Yonge township, Leeds county, Ont. (Not East Chimney Island shoals.)

**Grizzly**; bluff, near the mouth of Teslin river, Yukon. (Not Grizzly Bear Bluff.)

**Grizzly**; mountain, in the Selkirks, Kootenay district, B.C.

*Grizzly Bear.* See Landels.

**Grog**; island, in Batteau channel, north of Howe island, St. Lawrence river, Frontenac county, Ont.

*Groswater.* See Melville.

**Grotto**; mountain, east of Canmore, Rocky Mountains park, Alberta.

**Grove**; island, northeast of Huff island, bay of Quinte, Prince Edward county, Ont.

**Grundy**; creek, east of Kootenay river, north of Steele, Kootenay district, B.C.

**Gryphon**; lake, southwest of Wall-eye lake, Kenora district, Ont.

**Guano**; rock, southwest of Dead island, at entrance to Key harbour, Georgian bay, Parry Sound district, Ont.

*Guaquina.* See Muchalat.

**Guard**; island, Southgate group, Queen Charlotte sound, Coast district, B.C.

*Guard.* See Gurd.

**Guardsman**; mountain, northeast of Mt. Sir Sandford, Selkirk mountains, B.C.

*Guide.* See DeWatteville.

**Gull**; lake, east of Pelly lakes, Yukon.

*Gull.* See Barbara.

*Gull.* See Cavalier.

*Gull.* See Charwell.

*Gull.* See Ella.

*Gull.* See Kaiashk.

*Gull.* See Mississagua.

**Gullrock**; lake, southeast of Red lake, Patricia district, Ont. (Not Gull Rock.)

**Gulquac**; river, tributary to Tobique river, Victoria county, N.B.

**Gun**; creek and lake, tributary to Bridge river from the west, Lillooet district, B.C. (Not Gunn.)

**Gun**; lake, north of Nahlin river, Cassiar district, B.C.

**Gunamitz**; river, tributary to Restigouche R., N.B. (Not Gounamitz nor Little Fork.)

**Gunflint**; lake, international boundary, Thunder Bay district, Ont. (Not Gun Flint.)

*Gunliffe.* See Cunliffe.

**Gunn**; point, south of Douglas point, Bruce county, Ont.

*Gunn.* See Gun.

**Gunter**; lake, Cashel township, Hastings county, Ont. (Not Gunter's.)

**Gurd**; island, Kitkatlah inlet, Coast district, B.C. (Not Guard.)

**Gustavus**; mountains, between Mayo L. and Ladue and McQuesten rivers, Yukon.

**Guysborough**; county and town, N.S. (Not Guysboro.)

**Gyrfalcon**; islands, south coast of Ungava bay, N.W.T.

**Gzowski**; lake, east of Robinson L., Thunder Bay district, Ont.

# H

**Habel**; mount, S.W. of Mt. Collie, Rocky Mts., Kootenay district, B.C. (Not Hidden.)

*Habitants* See Inhabitants.

**Hache** (rivière à la); river, tributary to Tête-Blanche river ,Chicoutimi county, Que.

**Hackett**; cove, also Hackett Cove village, east shore of St. Margaret bay, Halifax county, N.S. (Not Hackett's Cove village nor Haggert cove.)

**Hackett**; river, tributary to Sheslay river, Cassiar district, B.C.

**Haddo**; peak, mount Aberdeen, Rocky mountains, Alberta.

**Hadow**; mount, west of Gerrard, Kootenay district, B.C.

**Haeckel**; hill, near the confluence of Lewes and Takhini rivers, Yukon.

**Hagerman**; village, York county, Ont. (Not Hagerman's Corners.)

**Haggart**; creek, tributary to Johnston creek, McQuesten river, Yukon.

*Haggert.* See Hackett.

**Ha Ha**; bay, lake and river, Chicoutimi Co., Que. (Not Bay Ha Ha nor Baie des Ha Ha.)

**Haileybury**; town, Timiskaming district, Ont.

*Hair.* See Nechigona.

**Hair Cutting**; lake and river, at headwaters of St. Maurice R., Champlain Co., Que.

**Halcro**; mountain peak, east shore of Atlin lake, Cassiar district, B.C.

**Halcyon**; mountain, east of Upper Arrow lake, Kootenay district, B.C. (Not Halcyon Hot Springs post office.)

**Haldane**; mount, near Mayo brook, Stewart river, Yukon.

**Hale**; creek, near south end of Taku arm, Tagish lake, Cassiar district, B.C.

**Haliburton**; lake, Harburn township, Haliburton county, Ont.

**Hall**; brook, harbour and point, Kings county, N.S. (Not Hall's.)

**Hall**; creek, tributary to Westkettle river, Similkameen district, B.C.

**Hall**; island, southeast of Reid island, southeast coast of Vancouver island, B.C.

**Hall**; lake, northwest of Cliff lake, Kenora district, Ont.

**Hall**; lake, west of Teslin lake, Cassiar district, B.C., also river flowing northerly into Teslin lake, B.C. and Yukon. (Not North River.)

**Hall**; mount, north of Chemainus river, Vancouver island, B.C. (Not Hall's.)

**Hall**; mount, west of Upper Arrow lake, Kootenay district, B.C.

**Hall**; peninsula, in the southeastern portion of Baffin island, N.W.T.

**Hall Harbour**; hamlet, Kings county, N.S. (Not Hall's Harbour.)

**Hallett**; lake, on trail between Cheslatta and Fraser lakes, Coast district, B.C.

*Halliday.* See Holliday.

*Hall's.* See Kushog.

**Halsey**; point, at the entrance to Douglas channel, Coast district, B.C.

**Halsted**; islet, Shushartie bay, Goletas channel, northern coast of Vancouver I., B.C

*Halsted.* See Holsted.

*Haly.* See Healy.

**Hambly**; island, Navy group, St. Lawrence river, Leeds county, Ont. (Not Humbly.)

**Hamill**; creek, flowing westerly into Duncan river, north of Kootenay lake, Kootenay district, B.C.

**Hamilton**; island, in Ottawa river, Prescott county, Ont. (Not Great nor Large.)

**Hamilton**; lake, Tp. 35, Rs. 9 and 10, W. 4 M., southeastern Alberta.

*Hamilton.* See Rough.

**Hammond**; bay, north of Departure bay, southeast coast of Vancouver I., B.C.

**Hammond**; point, east of Jenkins point, Manitoulin island, Manitoulin district, Ont.

*Hammond.* See Nelson.

**Hanalta**; lake, Tp. 31, R. 14, W. 4 M., Alberta. (Not Bullpound.)

**Hanbury**; peak, east of mount Vaux, Rocky mountains, Kootenay district, B.C.

**Hanceville**; post settlement, on Chilcotin river, Lillooet district, B.C.

**Hancock**; hills, east of lake Laberge, Yukon.

**Hand**; hills, east of Red Deer river, southern Alberta.

*Hanging Hide.* See Leather.

**Hanna**; bank, entrance of Key harbour, Parry Sound district, Ont.

**Hannah**; bay, south end of James bay, Timiskaming district, Ont.

**Hannah**; lake, east of South bay, lake Nipigon, Thunder Bay district, Ont.

**Hannah**; point, South bay, Manitoulin district, Ont.

*Hannah Bay* (river). See Harricanaw.

**Hansen**; lake, east of Kootenay river, north of Steele, Kootenay district, B.C.

**Harbour**; lake, west of Blind bay, Halifax county, N.S. (Not Black Duck Run.)

*Harbour.* See Rawson.

*Harbour au Bouche.* See Havre Bouché.

*Harbour de Lute.* See Loutre.

**Hardisty**; mount, east of Athabaska river, opposite mouth of Whirlpool river, Alta.

*Hardwood Plains.* See Harwood Plains.

**Hardy**; mountain, northwest of Carson, Similkameen district, B.C.

**Hare**; bank, island, passage, and reefs, St. Lawrence river, Temiscouata county, Que. French usage: Lièvres (île aux).

**Harmer**; creek, tributary to Grave creek, Kootenay district, B.C. (Not South Fork of Grave creek.)

**Harmony**; river, emptying into Harmony bay, east end of L. Superior, Algoma district, Ont. (Not Chippewa nor Harmonie.)

*Harmony.* See Jones.

**Harold**; mount, on lower part of Stikine river, Cassiar district, B.C.

**Harper**; mount, in the Ogilvie range, north of Klondike river, Yukon.

**Harper Corners**; hamlet, Wentworth county, Ont. (Not Harper's Corners.)

**Harricanaw**; river, emptying into Hannah bay, Timiskaming district, Ont., from Abitibi territory and Timiskaming county, Que. (Not Hannah Bay river.)

**Harrington**; group of islands, north shore gulf of St. Lawrence, St. Vincent township, Saguenay county, Que.

**Harrington**; hamlet, Oxford county, Ont. (Not Harrington West.)

*Harrington West.* See Harrington.

**Harris**; creek, branch of Ophir creek, Indian river, Yukon.

**Harris**; lake, southwest of Manitou lake, Kenora district, Ont.

**Harris**; lake, southwest of Savant lake, Thunder Bay district, Ont.

**Harris**; point, Lambton county, Ont. (Not Blue.)

**Harrison**; post office, Stormont county, Ont. (Not Harrison's Corners.)

**Harrison**; river, flowing northwesterly into Athabaska lake, near Stone point, Alta.

*Harrison's Corners.* See Harrison.

**Harry**; lake, Lawrence township, Haliburton county, Ont. (Not Harry's.)

**Hart**; mount, near Sixtymile river, southwesterly from Dawson, Yukon.

**Hartz**; creek, tributary to Tahltan river, Cassiar district, B.C.

**Harvey**; creek, tributary to Flathead river, Kootenay district, B.C. (Not Twenty-five Mile creek.)

**Harvey**; island, Brock group, St. Lawrence river, Leeds county, Ont. (Not Gibraltar.)

**Harwood Plains**; post office, Carleton county, Ont. (Not Hardwood Plains.)

**Haskins**; creek, tributary to Ottertail river, Rocky mountains, Kootenay district, B.C (Not Haskin.)

**Haslam**; creek, tributary to Nanaimo river, Vancouver island, B.C.

**Häsler**; peak, mount Dawson, Selkirk mountains, Kootenay district, B.C.

**Hastings**; county, also town in Northumberland county, Ont.

**Hastings**; lake, in Tp. 51, R. 20, W. 4th M., Alberta.

**Hatchau**; lake, Hackett river, Cassiar district, B.C. (Not Macha.)

**Hatin**; lake, near upper part of Koshin river, Cassiar district, B.C.

**Hatton**; headland, at south end of Resolution island, N.W.T. (Not Cape Best.)

**Haven**; cape, Baffin island, N.W.T. (Not Siggia.)

**Haven**; creek, flowing into the North Saskatchewan, below Bighorn river, central Alberta.

**Havre Bouché**; harbour and post village, near northwest entrance to the strait of Canso, Antigonish county, N.S. (Not harbour au Bouche nor Havre Boucher.)

**Hawk**; lake, also Hawk Lake railway station, Kenora district, Ont.

**Hawkeliff**; lake, west of Eagle lake, Kenora district, Ont. (Not Hawk Cliff.)

**Hawkesbury**; island, north of Princess Royal and Gribbell islands, Coast district, B.C.

**Hawkins**; creek, tributary to Moyie river, international boundary, Kootenay district, B.C. (Not Meadow nor Ripple.)

*Hawkrock.* See Keikewabik

**Hawtrey**; town, Oxford county, Ont. (Not Hawtry.)

**Hay**; lake, Sabine township, Nipissing district, Ont.

*Hay.* See Dobbs.

*Hay.* See Melville.

**Hayes**; mount, south of Haslam creek, Vancouver island, B.C.

**Hayes**; peak and river, west of Teslin lake, Cassiar district, B.C.

**Hayes**; river, southeast of Nelson R., Manitoba. (Not Hay's, Hill, Steel, nor Trout.) This name is now applied to the whole river from the source of the Echimamish to Hudson bay.

**Haygarth**; creek, tributary to Ottertail river, Yoho park, Rocky mountains, B.C.

**Hays**; cove, southwest of Ritchie point, Kaien island, Coast district, B.C.

**Hays**; creek, Prince Rupert harbour, Coast district, B.C.

**Hays**; mount, on Kaien island, east of Prince Rupert harbour, Coast district, B.C. (Not Oldfield.) Previous decision revised.

*Hay's.* See Hayes.

*Hays.* See Ritchie.

**Haystack**; mountain, N.E. of Windigo bay, L. Nipigon, Thunder Bay district, Ont.

*Hazel.* See Aberdeen.

**Hazelton**; town, at confluence of Bulkley and Skeena rivers, Cassiar district, B.C.

**Head**; mount, Highwood range, southern Alberta.

**Headingley**; parish and village, Man. (Not Headingly.)

*Head of Jordan River.* See Jordan river.

*Head of St. Peter's Bay.* See St. Peter.

**Healy**; creek, flowing southerly into Lardeau river, below Gerrard, Kootenay district, B.C. (Not Haley.)

**Healy**; lake, south of Kusawa lake, Yukon.

**Heart**; creek, east of Lower Arrow lake, Kootenay district, B.C.

**Heart**; lake, east of lac La Biche, central Alberta.

**Heart**; mountains, east of Sheslay river, Cassiar district, B.C.

**Heathcote**; lake, northwest of Barrington lake, Thunder Bay district, Ont.

**Hebden**; brook, flowing into Dinorwic lake, Kenora district, Ont. (Not Hebden's.)

**Hébécourt**; lake, Hébécourt township, Timiskaming county, Que.

**Hébert**; lake, Dufay township, Timiskaming county, Que. (Not Fish.)

*Hébert.* See Bear.

**Hecate**; channel, connecting Esperanza inlet with Tahsis canal, Vancouver I., B.C.

**Hecate**; strait, between Queen Charlotte islands and the mainland, Coast district, B.C.

*Hecate.* See Raymond.

**Hecla**; island, in lake Winnipeg, Man. (Not Big, Big Black nor Great Black.)

**Hector**; island, north shore of Hudson strait, N.W.T. (Not Khartum.)

**Hector**; lake, west of Manitou lake, Kenora district, Ont. (Not Large Trout.)

**Hector**; mount and lake, Rocky mountains, Alberta. (Not Bow lake nor Lower Bow lake.)

**Hector**; railway station, Kootenay district, B.C.

**Hedley**; creek, flowing into Similkameen river, at Hedley, Similkameen district, B.C. (Not Twenty Mile.)

**Height-of-land**; lake, northeast of Mattagami lake, Abitibi territory, Que.

**Heimdal**; spur, Valhalla mountains, Kootenay district, B.C.

**Hela**; peak, Valhalla mountains, Kootenay district, B.C.

**Helen**; lake, at headwaters of Bow river, Alberta.

**Helen**; lake, north of Nipigon, Thunder Bay district, Ont.

**Helen**; point, Douglas channel, near Kitkiata, Coast district, B.C.

*Helena.* See Kinney.

**Helmet**; mountain, southeast of mount Goodsir, Rocky Mts., Kootenay district, B.C.

*Hemlock.* See Mackay.

*Hen.* See North Fowl.

**Henderson**; creek, tributary to Yukon river, below Stewart river, Yukon.

**Henderson**; harbour, south of Crooks inlet, Hudson strait, N.W.T.

**Henderson**; lake, north of Uchucklesit harbour, Barkley sound, Vancouver island, B.C. (Not Anderson.)

**Hendon**; river, tributary to Kusawa river, Cassiar district, B.C., and Yukon.

**Hennigar**; brook and village, Hants county, N.S. (Not Weir, Joshua Hennigar brook nor Northfield.)

**Henning**; mount, at headwaters of Coquihalla river, Yale district, B.C.

**Henretta**; creek, at headwaters of Fording river, Kootenay district, B.C.

**Henrietta**; creek, tributary to Last-chance creek, a branch of Hunker creek, Yukon.

**Henry**; island, southwest of Port Hood, Inverness county, N.S. (Not Outer island, Outer island of Port Hood nor W. D. Smith's island.)

**Henry**; point, Pittsburgh township, Frontenac county, Ont.

**Henry Corners**; village, Lambton county, Ont. (Not Henry's Corners.)

**Hensley**; bay, south shore of Manitoulin island, Manitoulin district, Ont.

*Herb.* See Wekusko.

**Herbert Corners**; hamlet, Carleton county, Ont. (Not Herbert's Corners.)

**Hermit**; glacier, mountain and range of mountains, in the Selkirks, B.C.

*Heron.* See Mirond.

**Herschell**; island, west of Cockburn island and northeast of Kitchener island, Manitoulin district, Ont.

**Hess**; river, tributary to Stewart river, Yukon.

**Hester**; creek, branch of Hunker creek, Yukon.

*Hewson.* See Hughson.

**Hibben**; island, between Inskip and Moore channels, Moresby island, Queen Charlotte group, Coast district, B.C. (Not Kuper.)

*Hiboux.* See Ciboux.

**Hickey**; island, between Collier and Stave islands, Navy group, St. Lawrence river. Leeds county, Ont. (Not Smoke.)

*Hickory.* See Francis.

*Hidden.* See Habel.

*High.* See Emma.

*High.* See Highwood.

**High Bluff**; parish and village, on Assiniboine river, Manitoba.

**High Fall**; creek, tributary to Koksoak river, New Quebec.

*Highpound.* See Buffalo Pound.

**Highstone**; lake, north of Stranger lake, Kenora district, Ont.

**Highview**; hamlet, south of Broadview, Sask. (Not High View.)

*High Water.* See Piché.

**Highwood**; range of mountains, southern Alberta.

**Highwood**; river, tributary to Bow river, Alberta. (Not High.)

**Hilda**; peak, Valkyr mountains, Kootenay district, B.C.

**Hill**; cove, northeast of Prince Rupert, Coast district, B.C.

**Hill**; island, at entrance to Russell arm, Prince Rupert harbour, Coast district, B.C.

**Hill**; island, S.W. of Rockport, St. Lawrence R., Leeds county, Ont. (Not Leroux.)

**Hill Island**; lake, an expansion of Tazin river, N.W.T. (Not Nusheth.)

**Hill**; lake, northeast of Kakagi lake, Kenora district, Ont.

**Hill**; lake, on Minago river, Manitoba.

*Hill.* See Hayes.

**Hillfarm**; hamlet, north of Wolseley, Sask. (Not Hill Farm.)

**Hillhead**; village, Argenteuil county, Que. (Not Hill Head.)

**Hilton**; village, St. Joseph island, L. Huron, Algoma district, Ont. (Not Marksville.)

**Hinchinbrook**; township, Huntingdon county, Que. (Not Hinchinbrooke.)

*Hinckley.* See Carpenter.

**Hinton**; mount, Gustavus group, Yukon.

**Hippa**; island, W. of Graham I., Queen Charlotte Is., Coast dist., B.C. (Not Nesto.)

**Hitchcock**; creek, flowing east into Teslin lake, Cassiar district, B.C.

**Hobson**; island, in Mahone bay, Lunenburg county, N.S. (Not Hobson's Nose.)

**Hobson**; lake, north of Clearwater lake, Kootenay district, B.C. (Not Cedar nor Upper Clearwater.)

*Hockstall.* See Ecstall.

**Hoder**; creek, tributary to Little Slocan river, Kootenay district, B.C.

**Hodgins**; lake, south of lac Seul, Kenora district, Ont.

**Hodnett**; mount, northwest of the "big bend" of Wheaton river, southern Yukon.

**Hoffman**; mount, on south branch of Sheep river, southern Alberta.

*Hog.* See Camelot.

*Hog.* See McDonald.

*Hog.* See O'Neil.

*Hogarth.* See Cumberland

**Hogg**; creek, tributary to Moyie river, Kootenay district, B.C.

**Hoggan**; lake, near Dodd narrows, east coast of Vancouver island, B.C.

**Holden**; lake, east of Nanaimo river, Vancouver island, B.C. (Not Trois Bras.)

*Hole.* See Wanipigow.

**Holland**; bank, Ladysmith harbour, east coast of Vancouver island, B.C.

*Holland.* See Cascumpeque.

**Holliday**; point, Wolfe island, Frontenac county, Ont. (Not Halliday nor Levi.)

*Holmes.* See Home.

**Holsted**; bay, north shore of St. Lawrence river, Lansdowne township, Leeds county, Ont. (Not Halsted.)

**Holway**; mount, southwest of Sorcerer mountain, Selkirk Mts., Kootenay dist., B.C.

*Homalko.* See Homathko.

**Homan**; river, discharging into Bennett lake, Cassiar district, B.C.

**Homathko**; river, flowing into Bute inlet, Coast district, B.C. (Not Homalko.)

**Home**; bay, in N. end of Princess Royal I., Coast district, B.C. (Not Holmes.)

**Home**; island, Coronation gulf, N.W.T. (Not Sir E. Home's.)

**Hoodoo**; valley, near Leanchoil, Kootenay district, B.C.

**Hooker**; pass, at the head of St. Mary river, Kootenay district, B.C.

**Hoole**; cañon and river, upper part of Pelly river, Yukon.

**Hooper**; island, off the southeast side of Grenadier island, St. Lawrence river, Leeds county, Ont. (Not Hooper's.)

**Hoople**; creek, flowing into the St. Lawrence, at Dickinson Landing, Stormont county, Ont. (Not Hoople's, Hoopole nor Hoopple.)

*Hootalinqua.* See Teslin.

**Hopes Advance**; bay, west coast of Ungava bay, New Quebec.

**Hopes Advance**; cape, south shore of Hudson strait, New Quebec. (Not Cape of Hopes Advance nor Prince Henry Foreland.)

*Hopewell Corner.* See Albert.

**Hopkins**; bay and point, east of Baptist island, Bruce county, Ont.

**Hopkins**; lake, southeast of Aishihik lake, Yukon.

**Hopkins**; point, Devastation channel, Coast district, B.C.

**Horn**; cape, on the east side of Upper Arrow lake, Kootenay district, B.C.

*Horn.* See Beatrice.

**Horse**; creek, tributary to Bow river, Alberta.

**Horse**; lake, west of Sheridan lake, Lillooet district, B.C.

**Horse**; point, in eastern part of Ameliasburg township, Prince Edward county, Ont.

*Horse Block.* See Anderson.

**Horsehead**; creek, flowing northerly to Makwa R., central Sask. (Not Horse Head.)

**Horseshoe**; bay, west side of Great Duck island, Manitoulin district, Ont.

**Horseshoe**; glacier, south of mount Lefroy, Alberta.

**Horseshoe**; island, west of Wolfe island, Frontenac county, Ont. (Not Horse Shoe.)

*Horse Shoe.* See Chemainus.

**Horsethief**; creek, flowing easterly into Columbia river, north of Wilmer, Kootenay district, B.C.

**Horsfall**; island, between Campbell and Dufferin islands, Coast district, B.C.

**Horswell**; bluff and channel, S.E. coast of Vancouver I., B.C. (Not Inner channel.)

**Horton**; creek, tributary to Pelly river, between Hoole and Ketza rivers, Yukon.

**Horton**; point, north of Kincardine, Bruce county, Ont.

**Hosier**; river, flowing into St. Margaret bay, Halifax county, N.S. (Not Osier.)

**Hosmer**; mountain ridge, between Elk river and Michel creek, east of Hosmer, Kootenay district, B.C.

**Hospital**; creek, flowing into Columbia river, below Golden, Kootenay district, B.C.

**Hotailuh**; mountains, between Stikine and Tanzilla rivers, Cassiar district, B.C.

**Houghton**; lake, in Tps. 39 and 40, R. 22, W. 2 M., Sask. (Not Dirtywater.)

**Houghton**; lake, southwest of Kashaweogama lake, Thunder Bay district, Ont.

*Houghton.* See Muskiki.

**Hourglass**; lake, west of Hodgins lake, Kenora district, Ont.

**House**; mountain, between Driftpile and Inverness rivers, S. of Lesser Slave L., Alta.

*House.* See Howse.

*Housten.* See Hughson.

*Houston.* See Houstoun.

**Houstoun**; passage, between Admiral, Kuper and Narrow islands, strait of Georgia, New Westminster district, B.C. (Not Houston.)

**Howe**; island, St. Lawrence river, Frontenac county, Ont.

*Howe.* See Fuller.

**Howell**; creek, tributary to Flathead river, Kootenay district, B.C.

**Howse**; pass and peak, Rocky mountains, Alta. and B.C. (Not House.)

**Howser**; creek, flowing southwesterly into Duncan river, north of Duncan lake, Kootenay district, B.C.

**Howser**; ridge, northwest of Duncan lake, Kootenay district, B.C.

*Howser.* See Duncan.

**Hozameen**; range of mountains, east of Skagit river, near international boundary, Yale district, B.C. (Not Hozamen, Hozomen nor Hozomeen.)

**Hubbards**; village, Halifax Co., N.S. (Not Hubbards Cove.) Previous decision revised.

**Huber**; mount, near mount Victoria, Rocky mountains, Kootenay district, B.C.

**Hubert**; railway station, north shore of Skeena river, Coast district, B.C.

**Hubley**; cove, St. Margaret bay, also lake and Ry. sta., Halifax Co., N.S. (Not Hubly.)

*Hubly.* See Hubley.

*Huckleberry.* See Mile.

*Huckstall.* See Ecstall.

**Hudson**; bay, Ontario, Quebec, Manitoba and N.W.T. (Not Hudson's.)

**Hudson**; island, south of Thetis island, Stuart channel, S.E. coast of Vancouver I., B.C.

**Hudson**; strait, between Baffin island, N.W.T. and New Quebec.

**Hudson Bay**; mountains, west of Bulkley river, and south of Moricetown, Coast district, B.C.

**Huff**; island, in Muscote bay, bay of Quinte, Prince Edward Co., Ont. (Not Huff's.)

**Hugh**; mount, east of lake Evans, Abitibi territory, Que.

**Hughes**; brook, Barritt bay, Wabigoon L., Kenora district, Ont. (Not Hughes creek.)

**Hughes**; range of mountains, east of Kootenay river, Kootenay district, B.C.

**Hughson**; bay, east of Providence bay, Manitoulin island, Manitoulin district, Ont. (Not Hewson, Housten nor Husten.)

**Humber**; bay, railway station, river and village, also Humber Bay post office and summer resort, York county, Ont. (Not Clairville village.)

*Humbly.* See Hambly.

**Humboldt**; bay, east shore of lake Nipigon, Thunder Bay district, Ont.

**Humboldt**; electoral district and town, Sask. (Not Humbolt.)

**Hungabee**; glacier and mountain, Bow range, Alta. and Kootenay district, B.C.

**Hungerford**; point, south shore of Manitoulin island, Ont.

**Hungry**; bay, northeast side of Big bay, bay of Quinte, Ont.

**Hungry**; peak, at head of St. Mary river, Kootenay district, B.C.

**Hunker**; creek, tributary to Klondike river, Yukon.

**Huns Valley**; village, Macdonald electoral district, Man. (Not Hun's Valley.)

**Hunter**; island, near Int. bdy., Rainy River district, Ont. (Not Hunter's nor Hunters.)

**Hunter**; mount, north of Palliser station, Kootenay district, B.C.

**Hunters**; range of mountains, south of Eagle river, Kamloops district, B.C.

**Huntingdon**; post settlement, international boundary, New Westminster district, B.C.

**Huntress**; reef, southwest of Johnston point, Bruce county, Ont.

**Hurd**; cape, west extreme of Bruce Co., Ont. Cape Hurd channel is west of the cape.

**Hurd**; mount, also pass, in the Ottertail range of the Rockies, Kootenay district, B.C.

**Hurdman**; hamlet, Carleton county, Ont. (Not Hurdman's Bridge.)

*Hurdman's Bridge.* See Hurdman.

**Hurley**; river, tributary to Bridge river, Lillooet district, B.C. (Not South Fork of Bridge river.)

**Huron**; river, flowing into Chambly basin, Richelieu river, Rouville county, Que. (Not Marieville creek.) Authorized French form: rivières des Hurons.

**Hurricane**; river, tributary to Nakina river, Cassiar district, B.C.

*Husten.* See Hughson.

**Hutchinson**; hamlet, Middlesex county, Ont. (Not Hutchison.)

**Hutchison**; creek, flowing from Bowden lake to Wabigoon river, Kenora district, Ont.

**Hutchison**; creek, flowing into east side of Lower Arrow lake, Kootenay district, B.C.

*Hutchison.* See Hutchinson.

**Hutshi**; lakes, west of lake Laberge, Yukon.

**Hutshiku**; bluff, on Lewes river, below Rink rapid, Yukon.

**Hutsigola**; lake, south of Teslin lake, Cassiar district, B.C. (Not Hutsigula.)

*Huxstall.* See Ecstall

**Hyland**; hill, east of Hutsigola lake, Cassiar district, B.C.

**Hyndman**; bay, at southwest end of Cockburn island, Manitoulin district, Ont. (Not Sand.)

## I

**Icarus**; point, Nanoose harbour, east coast of Vancouver island, B.C.

**Ice**; portage, on the lower part of Nottaway river, below Kitchigama river, Abitibi, Que.

**Ice**; river, tributary to Beaverfoot river, Kootenay district, B.C.

**Ice-cap**; mountain, near lower Stikine river, Cassiar district, B.C. (Not Ice-capped.)

**Icelandic**; river, emptying into lake Winnipeg, Man. (Not Icelanders.)

*Ichimanicuagan.* See Ishimanikuagan.

**Iconoclast**; mountain, Selkirk range, Kootenay district, B.C.

**Icy**; cove, east of North bay, Hudson strait, N.W.T.

**Ida**; mount, south of Salmon arm of Shuswap lake, Kamloops district, B.C.

**Ikeda**; bay, entrance of Skincuttle inlet, southeast coast of Moresby island, Queen Charlotte group, Coast district, B.C.

*Ile aux Morts.* See Lark.

**Ile-aux-Noix**; post office, St. Johns county, Que. (Not Isle aux Noix.)

**Ile-Bizard**; hamlet, on island of same name, St. Lawrence river, Jacques-Cartier county, Que. (Not Isle Bizard.)

**Ile-Perrot**; hamlet, Vaudreuil county, Que. (Not Isle Perrot.)

**Illecillewaet**; glacier, mining division, river and town, Kootenay district, B.C. (Not Illecilliwaet, Illicillewaet nor Illicilliwaet.)

**Illes**; brook, emptying into Frances lake, Yukon. (Not Il-es-too-a.)

**Impérieuse**; rock, Nanoose harbour, east coast of Vancouver island, B.C.

**Incomappleux**; river, flowing into Upper Arrow L., Kootenay dist., B.C. (Not Fish.)

**Independence**; creek, tributary to Stewart river, Yukon.

**Indian**; brook, flowing into St. Ann bay, Victoria county, N.S.

**Indian**; harbour, point and reef, south of Fitzwilliam island, Manitoulin district, Ont.

**Indian**; island, northeast of Murray canal, entrance of the bay of Quinte, Prince Edward county, Ont.

**Indian**; peak, west of Ferro pass, Rocky mountains, Kootenay district, B.C.

**Indian**; river, tributary to Yukon river, south of Klondike river, Yukon.

*Indian.* See Dares.

*Indian.* See Longspell.

*Indian.* See Pleasant.

*Indian.* See Southern Indian.

*Indian Pear Island lake.* See Saskeram

**Ingall**; island, S. of Whitney Pt., St. Lawrence R., Leeds Co., Ont. (Not Shoemaker.)

**Ingall**; lake, southwest of Wabigoon lake, Kenora district, Ont.

*Inganish.* See Ingonish.

**Ingersoll**; mount, west of Columbia river, Kootenay district, B.C.

**Inglewood**; village, Peel county, Ont. (Not Inglewood Junction.)

**Inglismaldie**; mount, south of Minnewanka lake, Rocky mountains, Alberta.

**Ingonish**; bay, river and town, Victoria county, N.S. (Not Inganish nor Niganishe.)

*Ingraham.* See Louis.

**Ingram**; mount, north of Kusawa lake, Yukon.

**Inhabitants**; river, Richmond county, N.S. (Not Habitants.)

**Inklin**; river, tributary to Taku river, Cassiar district, B.C.

**Inkster**; rock, at South Baymouth, Manitoulin island, Manitoulin district, Ont.

**Inlin**; brook, tributary to lower Gravel river, N.W.T.

*Innarulligang.* See East.

*Inner.* See Horswell.

**Inner Duck**; island, northeastern island of Duck I. group, Manitoulin district, Ont.

**Inonoaklin**; creek, west of Lower Arrow L., Kootenay district, B.C. (Not Sanderson.)

*Insulated.* See Isolated.

**Inukshiligaluk**; point, south coast of Ungava bay, New Quebec. (Not Big Rock.)

**Inukshuktuyuk**; point, south coast of Ungava bay, New Quebec. (Not Beacon.)

**Inverhuron**; bay and village, Bruce county, Ont.

**Invermere**; townsite, south of Windermere, Kootenay district, B.C. (Not Canterbury.)

**Inverness**; passage, between Porpoise harbour and Skeena R., B.C. (Not N. Skeena.)

**Inverness**; river, tributary to Swan river, south of Lesser Slave lake, central Alberta.

**Iosegun**; lake and river, tributary to Little Smoky river, Alta. (Not Attim Segoun nor Io-se-gun.)

*Ipperwash.* See Kettle.

**Ireland**; township, Megantic county, Quebec.

**Irishman**; creek, tributary to Moyie river, Kootenay district, B.C.

**Iron**; creek, tributary to Battle river, eastern Alberta.

**Iron**; creek, tributary to Bull river, Kootenay district, B.C.

**Iron**; lake, west of Crooked lake, international boundary, Rainy River district, Ont.

**Iroquois**; lake, Tp. 48, Rs. 7 and 8, W. 3 M., Sask.

**Irving**; bay, Crooks inlet, Hudson strait, N.W.T.

**Irving**; post settlement, Albert county, N.B. (Not Baltimore.)

**Isaac Harbour**; town, Guysborough county, N.S. (Not Isaac's Harbour.)

**Isabella**; lake, northeast of Peyto lake, Alberta.

*Isabemagussi.* See Magusi.

**Iserhoff**; river, emptying into Waswanipi lake, Abitibi territory, Que.

**Ishimanikuagan**; lake, Saguenay Co., Que. (Not Ichimanicuagan nor Ishimanicougan.)

*Iskut.* See Kinaskan.

**Iskwatikan**; lake, north of lake La Ronge, central Saskatchewan.

**Island**; lake, northeast of L. Winnipeg, and draining into Hayes river, Manitoba.
*Island.* See Ashby.
*Island.* See Dasserat.
*Island.* See Trade.
*Island.* See Isle.
*Island Portage* (lake). See Pine.
**Islands**; lake of, southeast of Abitibi lake, Timiskaming county, Que.
**Isle**; lake, west of St. Ann, Alberta. (Not Island lake.)
*Isle aux Pêches.* See Peach.
*Isle Bizard.* See Ile-Bizard.
*Isles de Bois.* See Morris.
*Isle of Coves.* See Cove.
**Islet**; point, southwestern extremity of Sonora island, Coast district, B.C.
*Isnor.* See Eisner.
**Isolated**; peak, at head of Yoho valley, Rocky mountains, Kootenay district, B.C. (Not Insulated nor Lonely.)
*Ithenotosquan.* See Elbow.
**Itsi**; lakes, on Ross river, also mountains between Macmillan and Ross rivers, Yukon.
**Ittimenotok**; cape, east shore of Ungava bay, New Quebec.
**Ivan**; point, Manitoulin island, east of Burnt island, Manitoulin district, Ont.

## J

**Jack**; lake, Burleigh township, Peterborough county, Ont. (Not Jack's.)
**Jack**; point, S. entrance to Nanaimo, Vancouver I., B.C. (Not Jack's nor Sharp.)
**Jackhead**; island, lake and river, north of Fisher bay, lake Winnipeg, Man. (Not Jack-Head.)
*Jackman.* See Pritzler.
**Jackson**; creek, tributary to Souris river, southern Manitoba and Saskatchewan.
**Jackson**; mount, south of Tulameen, Yale district, B.C.
*Jackson.* See Robertson.
**Jackstraw**; island, west of Gordon island, St. Lawrence river, Leeds county, Ont.
**Jackstraw**; lighthouse and shoal, St. Lawrence river, west of Gananoque, Leeds county, Ont. (Not Jack Straw.)
**Jacob**; creek, tributary to Bow river, Alberta.
**Jacob**; island, at entrance to Rupert bay, James bay, N.W.T. (Not Wood.)
**Jacob**; lake, Caire township, Timiskaming county, Que. (Not Fish.)
**Jacques-Cartier**; lake and river, Montmorency county, Que. (Not Grand Lake Jacques Cartier.)
**James**; cape, north shore of Hudson strait, N.W.T.
**James**; island, Sidney channel, southeast coast of Vancouver island, B.C.
**James**; island and reef, between Fitzwilliam and Yeo islands, Georgian bay, Manitoulin district, Ont.
**James**; river, tributary to Red Deer river, southern Alberta.
*James Ross.* See Ross.

**Jamieson**; lake, Dungannon township, Hastings county, Ont. (Not Jamieson's).

*Jamieson's.* See Egan.

**Janet**; lake, between Stewart river and Mayo brook, Yukon.

**Jansen**; lake and post office, west of the Quill lakes, southern Saskatchewan.

**Janvrin**; island, and Janvrin Harbour, hamlet, Richmond Co., N.S. (Not Jauvrin's.)

*Jareux.* See Jureux.

**Jarvis**; bay, island, point, river and rock, Thunder Bay dist., Ont. (Not Turtle Pt.)

**Jarvis**; lake, between Athabaska and Baptiste rivers, Alta. (Not Upper White Fish.)

*Jauvrin's.* See Janvrin.

**Jay**; lake, Pettypiece township, Kenora district, Ont.

**Jean**; lake, southeast of lake Nipigon, Thunder Bay district, Ont.

*Jean de Terre.* See Gens-de-terre.

**Jeannette**; creek, post office and railway station, Kent county, Ont. (Not Jeannette's creek nor Jeannette's Creek P.O.)

**Jean-Noël**; river, flowing into the St. Lawrence, at St. Irénée, Charlevoix Co., Que.

**Jean-Pierre**; bay and point, southwest of Sturgeon bay, north shore of L. Superior, Thunder Bay district, Ont.

**Jeffrey**; mount, west of Saanich inlet, Vancouver island, B.C.

**Jenkins**; point, east of Providence bay, Manitoulin island, Manitoulin district, Ont.

**Jennie Graham**; the most southerly shoal off Great Duck I., Manitoulin district, Ont.

**Jennings**; river, emptying into Teslin lake, Cassiar district, B.C. (Not Fifteenmile.)

**Jensen**; creek, tributary to Dominion creek, Indian river, Yukon.

**Jesse**; island, entrance to Departure bay, southeast coast of Vancouver island, B.C.

**Jessie**; lake, Purdom township, Thunder Bay district, Ont.

Jesup land. See Ellesmere.

**Jim**; creek, tributary to Yukon river, below Indian river, Yukon.

**Joan**; point, near Dodd narrows, east coast of Vancouver island, B.C.

**Joassa**; channel, between Dufferin and Horsfall islands, Coast district, B.C.

**Jocelyn**; hill, east side of Finlayson arm, Vancouver island, B.C.

**Jockvale**; hamlet, Carleton county, Ont. (Not Jock Vale.)

**Joel**; river, tributary to Klondike river, Yukon.

**Joggins**; village, Cumberland county, N.S. (Not Joggin Mines, South Joggins, nor South Joggings.)

**John**; creek, flowing easterly into Meadow creek, Kootenay district, B.C. (Not Williams.)

**John**; lake, below Itsi lakes, Ross river, Yukon.

**John**; lake, northeast of Silver lake, Kenora district, Ont.

**John**; river, also River John, post office, Pictou county, N.S.

*Johnny.* See Johnson.

**Johnson**; bay, north shore of Howe island, Frontenac Co., Ont. (Not Johnston.)

**Johnson**; lake, Havelock township, Haliburton county, Ont. (Not Johnson's.)

**Johnson**; lake and railway station, southeast of Latchford, Timiskaming district, Ont. (Not Johnny lake nor Johnston station.)

**Johnson**; mount, between Lake creek and Lardeau river, Kootenay district, B.C.

**Johnson**; range of mountains, between Atlin L. and O'Donnel R., Cassiar district, B.C.

**Johnston**; creek, tributary to McQuesten river, Yukon.

**Johnston**; creek, west of Lower Arrow lake, Kootenay district, B.C.

**Johnston**; harbour and point, southeast of Porcupine point, Bruce county, Ont.

**Johnston**; lake, southern Saskatchewan.

**Johnston Corners**; hamlet, Carleton county, Ont. (Not Johnston's Corners nor Johnstone's Corners.)

**Jojo**; lake, north of lake Nipigon, Thunder Bay district, Ont.

**Jolicœur**; village, Westmorland county, N.B. (Not Jolicure.)

**Joli Head**; headland, Queens county, N.S. (Not Jolie Head.)

**Jonas**; creek, flowing northwesterly into Sunwapta river, also pass at the head of the creek, western Alberta.

**Jones**; creek, flowing to Batchawana bay, L. Superior, Ont. (Not Harmony river.)

**Jones**; island, Lake Fleet group, St. Lawrence river, Leeds county, Ont.

**Jones**; shoal, S. of Labrador reef and S.W. from Bélanger point, Manitoulin dist., Ont.

**Jonquière**; parish, township and village, Chicoutimi county, Que. (Not Jonquières.)

**Jordan**; lake and river, Hastings county, Ont.

**Jordan**; river, flowing into Frobisher bay, N.W.T.

**Jordan**; river, flowing into Juan de Fuca strait, Vancouver island, B.C.

**Jordan**; river, tributary to Columbia river, near Revelstoke, Kootenay district, B.C.

**Jordan Harbour**; post office, Lincoln county, Ont. (Not Jordan Harbor.)

**Jordan River**; village, Shelburne county, N.S. (Not Head of Jordan River.)

**Jorkins**; point, southeast entrance to Finlayson channel, B.C. (Not Dawkins.)

**Joseph**; creek, tributary to St. Mary river, Kootenay district, B.C.

*Joshua Hennigar.* See Hennigar.

**Joss**; mountain, northeast of Mabel lake, Kamloops district, B.C.

**Joubert**; island, south of Cascade point, Soulanges county, Que. (Not Round.)

**Joy**; bay, south shore of Hudson strait, New Quebec.

**Joy**; mountain, between Hess and Lansing rivers, Yukon.

**Jubilee**; island, north shore of Hudson strait, N.W.T.

**Jubilee**; mountain, near north end of Atlin lake, Yukon.

**Julian**; point, east of Chorkbak inlet, north shore of Hudson strait, N.W.T.

**Julien**; islet, on Kamouraska mud flats, Kamouraska county, Que.

**Jumbo**; creek, flowing easterly into Toby creek, Kootenay district, B.C.

**Jumping**; lake, east of the Birch hills, central Saskatchewan.

**Jumping Deer**; creek, tributary to Qu'Appelle river, Sask. (Not Jumpingdeer.)

**Jumpingpound**; creek, tributary to Bow river, Alberta. (Not Jumping Pond.)

**Junction**; mountain, on South branch of Sheep river, southern Alberta.

**Jungle**; creek, tributary to Nation river, international boundary, Yukon.

**Junnusuksoak**; inlet, east shore of Ungava bay, New Quebec.

**Juno**; point, south of Pine Tree harbour, Bruce county, Ont.

**Jupiter**; river, south side of Anticosti I., Saguenay county, Que. (Not Observation.)

*Jupiter.* See Shallop.

**Jureux**; point, also river flowing into the St. Lawrence below Goose cape, Charlevoix county, Que. (Not Jareux.)

# K

**Kabagukski**; lake, south of Sasakwei lake, Kenora district, Ont. (Not Mud.)

**Kabakwa**; lake, Stanhope township, Haliburton Co., Ont. (Not Kah-bah-bah-quah.)

**Kabania**; lake, west of Attawapiskat lake, Patricia district, Ont.

**Kabikwabik**; lake, south of Minnitaki lake, Kenora district, Ont. (Not Kapikwabikok.)

**Kabistachuan**; bay, in southern portion of Mistassini lake, Que. (Not Cabistachuan.)

**Kabitotikwia**; lake and river, draining into Kaiashk bay, L. Nipigon, Thunder Bay district, Ont. (Not Kabitotiquia.)

*Kabitotiquia.* See Kabitotikwia.

*Kabitustigweiak.* See Butler.

**Kabona**; lake, south of Matchimanito lake, Pontiac county, Que.

**Kagianagami**; lake, north of Ogoki river, Thunder Bay district, Ont.

*Kag-ish-a-bog-a-mog.* See Kasshabog.

**Kagiwiosa**; lake, east of Dinorwic lake, Kenora district, Ont.

**Kaha**; creek, tributary to Koshin river, Cassiar district, B.C. (Not Kahak.)

*Kah-bah-bah-quah.* See Kabakwa.

*Kah-mini-ti-gwa-quiack.* See Bluffy.

*Kah-shah-gah-wig-e-mog.* See Kashagawi.

**Kahtate**; river, tributary to lower part of Stikine river, Cassiar district, B.C.

*Kahuch.* See Katonche.

*Kah-wah-she-be-mah-gog.* See Kushog.

*Kahwambejewagamog.* See Kawagama.

**Kaiashk**; bay and river, W. shore of L. Nipigon, Thunder Bay dist., Ont. (Not Gull.)

**Kaiashkomin**; lake, north of Wabigoon lake, Kenora district, Ont. (Not Bad Rice.)

**Kaien**; island, Prince Rupert harbour, Coast district, B.C. (Not Kai-en.)

**Kaiete**; point, at east entrance to Lama passage, Coast district, B.C. (Not Calete. Ki-ette nor Kyeet.)

*Kaijick Manitou.* See Baptiste.

*Kaikaquabick.* See Reception.

*Kains.* See Cain.

*Kaishk.* See Evain.

*Ka-its-siks.* See Kasiks.

*Kajakanikamak.* See Dufresnoy.

*Kajoualwang.* See Najwalwank.

**Kakabonga**; lake and river, east of Grand lake Victoria, Pontiac county, Que. (Not Kakebonka.)

**Kakagi**; lake, E. of Sabaskong bay, L. of the Woods, Kenora dist., Ont. (Not Crow.)

*Kakameonan.* See Bellefeuille.

**Kakashe**; river, tributary to Kapitachuan river, Montcalm county, Que.

*Kakebonka.* See Kakabonga.

**Kaketsa**; mountain, north of Telegraph Creek village, Cassiar district, B.C. (Not Koketsa.)

**Kakinagimak**; lake, south of Churchill river and east of Pelican narrows, Sask. (Not Kakinokumak.)

**Kakinnozhans**; lake, near Manitou lake, Kenora district, Ont.

*Kakinokamak.* See Lemoine.

*Kakinokumak.* See Kakinagimak.

*Kakinookama.* See Margaret.

*Kakisksagamak.* See Ventadour.

*Ka-koot.* See Kakut.

**Kakuchuya**; river, tributary to Dudidontu river, Cassiar district, B.C.

**Kakut**; lake and river, in the Birch hills, south of Dunvegan, Alta. (Not Ka-koot.)

*Ka-lik-took-duag.* See Crooks.

**Kalzas**; lake, between Macmillan and Stewart rivers, Yukon.

**Kama**; bay and Ry. station, Nipigon bay, Thunder Bay dist., Ont. (Not Mazokama.)

**Kamachigama**; lake, and river tributary to the upper Ottawa, Montcalm county, Que.

*Kamamintigongue.* See Lescarbot.

**Kamanatogama**; lake, southeast of Boyer lake, Kenora district, Ont.

**Kamaniskeg**; lake, Bangor township, Hastings county, Ont.

**Kamatsi**; lake, on Churchill river, east of Reindeer river, central Saskatchewan.

*Kamilikamac.* See Biart.

**Kaministikwia**; river and railway station, Thunder Bay district, Ont. (Not Kaministiquia.)

**Kaminnassin**; lake, south of Dinorwic lake, Kenora district, Ont.

*Kaminnaweiskagwok.* See Minnaweiskag.

**Kaminni**; lake, N.W. of Manitou lake, Kenora district, Ont. (Not Kaminneseipekok.)

**Kamitsgamak**; lake, on Ribbon river, upper St. Maurice river, Champlain county, Que.

**Kamongus**; lake, near Manitou lake, Kenora district, Ont. (Not Canoe.)

*Kamoukakwiti.* See Piché.

**Kamouraska**; bay, county, group of islands, river and village, Que.

**Kampigukakatoka**; river, tributary to Migiskan river, Pontiac county, Que.

**Kamshigama**; lake and river, north of Shabogama lake, Abitibi territory, Que.

**Kananaskis**; lakes and river, tributary to Bow river, post office, railway station, and range of mountains, Alta., also pass, Alta and B.C.

**Kānasuta**; river, flowing from Dasserat lake to Duparquet lake, Timiskaming Co., Que.

**Kandik**; river, tributary to Yukon river, international boundary, Yukon. (Not Charley creek.)

*Kangerflung.* See Newell.

*Kangerthialuksoak.* See George.

**Kaniapiskau**; river, tributary to Koksoak river, New Quebec. (Not Wanguash.)

*Kaniapiskau.* See Keniapiskau.

**Kanikawinika**; lake, upper Ottawa river, east of Grand lake Victoria, Pontiac county, Que. (Not Kaniquonika nor Kanequanoka.)

**Kanimitti**; river, flowing into Shoshokwan river, a tributary of the upper Ottawa, Pontiac county, Que. (Not Kanimittikoshkwa.)

**Kanish**; bay, S. of Granite point, Quadra island, Coast district, B.C. (Not Cahnish.)

**Kanotaikau**; lake, at headwaters of Rupert river, Mistassini territory, Que.

**Kanuchuan**; river, tributary to upper Attawapiskat river, Patricia district, Ont.

**Kanus**; river, trib. to St. Croix R., Charlotte Co., N.B. (Not Canous nor Canouse.)

**Kanusio**; lake, and river tributary to Kekek river, Pontiac county, Que.

**Kaopskikamak**; lake and river, southeast of Manitou lake, Kenora district, Ont

**Kaoskauta**; lake, N.W. of Manitou L., Kenora district, Ont. (Not Kaoskowtakok.)

**Kapemitchigama**; lake, at the sources of Ottawa river, Joliette county, Que. (Not Kapemechigama.)

**Kapesakosi**; lake, west of Manitou lake, Kenora district, Ont. (Not Kapesakosikok.)

**Kapikik**; lake, south of Cat lake, Patricia district, Ont. (Not Pine channel nor Wapikik lake.)

**Kapikitegoitch**; lake, headwaters of Ashuapmuchuan river, Chicoutimi county, Que.

*Kapikwabikok.* See Kabikwabik.

**Kapiskau**; river, N. of Albany R., Patricia, Ont. (Not Ka-pis-cow nor Kaypiscow.)

**Kapitachuan**; lake, and river tributary to the upper Ottawa river, Berthier, Joliette, Maskinonge, Montcalm and Pontiac counties, Que. (Not Kapitashewinna nor Kapitajewin.)

**Kapitagama**; lake, southeast of Abitibi lake, Timiskaming county, Que.

*Kapitajewin.* See Kapitachuan.

*Kapitashewinna.* See Kapitachuan.

*Kapitoukamick.* See Salone.

**Kapitswe**; lake, at headwaters of St. Maurice river, Champlain county, Que.

**Kapkichi**; lake, north of L. St. Joseph, Patricia district, Ont.

**Kaposvar**; creek, tributary to Qu'Appelle river, Sask. (Not Little Cutarm.)

*Karmutsen.* See Nimpkish.

**Kasagiminnis**; lake, north of L. St. Joseph, Patricia district, Ont.

*Kasakacheweiwak.* See Uphill.

**Kashagawi**; lake, Stanhope Tp., Haliburton Co., Ont. (Not Kah-shah-gah-wig-e-mog.)

**Kashagawigamog**; lake, Dysart and Minden townships, Haliburton county, Ont.

**Kashaweogama**; lake, southwest of Savant lake, Thunder Bay district, Ont.

**Kasiks**; railway sta., also river tributary to Skeena R., B.C. (Not Ka-its-siks.)

**Kaskawulsh**; river, tributary to Alsek river, southwestern Yukon (Not O'Connor.)

**Kaslo**; river and town, west side of Kootenay lake, Kootenay district, B.C.

**Kasshabog**; lake, Methuen Tp., Peterborough Co., Ont. (Not Kag-ish-a-bog-a-mog.)

**Kate**; point, at upper end of Lower Arrow lake, Kootenay district, B.C.

**Katepwe**; lake, an expansion of Qu'Appelle river, the eastern in the chain of the "Fishing lakes"; also village, Sask.

**Kates Needle**; mountain, near Stikine R., opp. Porcupine creek, Cassiar district, B.C.

**Katharine**; lake, at headwaters of Bow river, Rocky mountains, Alberta.

**Kathawachaga**; lake, south of Coronation gulf, N.W.T. (Not Cathawhachaga.)

**Katherine**; lake, on Lady Evelyn river, below Grays river, Sudbury disitrict, Ont.

**Kathlyn**; lake, at east base of Hudson Bay mountains, south of Moricetown, Coast district, B.C. (Not Chickens.)

**Katina**; creek, tributary to Silver Salmon river, Cassiar district, B.C.

**Katonche**; lake, east of Grand lake Victoria, Pontiac county, Que. (Not Kahuch.)

**Katrina**; creek, tributary to White river, Yukon.

**Kattaktok**; cape, east shore Ungava bay, New Quebec.

*Katutok.* See Charles.

*Kauffman.* See Kiwetinok.

**Kausakuta**; lake and river, tributary to Vermilion river, Champlain county, Que (Not Caousacouta nor Caouasagouta.)

*Kawachikamick.* See Sincennes.

**Kawagama**; lake, Sherborne Tp., Haliburton Co., Ont. (Not Kahwambejewagamog.)

*Kawakashkagama.* See Kawashkagama.

**Kawasachuan**; lake and river, near Grand L. Victoria, Timiskaming county, Que. (Not Kawasajewan nor Kawassajewan.)

*Kawasgisguegat.* See Kawaskisigat.

**Kawashekamuk**; lake, southeast of Dinorwic lake, Kenora district, Ont. (Not Long.)

*Kawasheibemagagamak.* See Washeibemaga.

*Kawashekamick.* See Sincennes.

**Kawashkagama**; lake and river, north of Long lake, Thunder Bay district, Ont. (Not Kawakashkagama.)

**Kawaskisigat**; lake, headwaters of Lièvre river, St. Maurice county, Que. (Not Kawasgisguegat.)

**Kawastaguta**; bay, at the northerly end of Grand lake Victoria, Pontiac and Timiskaming counties, Que.

**Kawaweogama**; lake, northeast of Seseganaga lake, Thunder Bay district, Ont.

**Kawawia**; lake, southeast of Manitou lake, Kenora district, Ont. (Not Oval.)

*Kawawiagamak.* See Wawiag.

*Kay-gat.* See Keigat.

*Kaypiscow.* See Kapiskau.

**Kazabazua**; river, Ottawa and Pontiac counties; also village, Ottawa county, Que. (Not Kazubazua nor Kazuabazua.)

**Keary**; creek and lake, emptying into Bridge river, Lillooet district, B.C.

**Kedgwick**; river, Restigouche Co., N.B. (Not Kedgewick nor Quatawamkedgewick.)

*Keec.* See Kiekkiek.

*Kee-ec-kee-ec.* See Kiekkiek.

**Keefer**; island, at entrance to Key harbour, Georgian bay, Parry Sound district, Ont.

*Keejimacoogie.* See Kejimkujik.

**Keele**; peak, Mackenzie-Yukon watershed, N.W.T.

**Keen**; mount, west of Poplar, Kootenay district, B.C.

*Keepewa.* See Kipawa.

*Kee-she-kas.* See Kishikas.

**Keg**; lake, on Churchill river, northeast of L. La Ronge, Saskatchewan. (Not Barrel.)

**Keglo**; bay, east shore of Ungava bay, New Quebec.

*Kehecwin.* See Kehiwin.

**Kehiwin**; Indian reserve, also lake, eastern Alberta. (Not Kehecwin.)

**Keigat**; lake, southwest of Cat lake, Patricia district, Ont. (Not Kay-gat.)

**Keikewabik**; lake, south of Minnitaki lake, Kenora district, Ont. (Not Hawkrock.)

**Kejimkujik**; lake, Annapolis and Queens counties, N.S. (Not Cegemecega, Keja-makuja, Keejimacoogie, Kerjimacongie nor Segum Sega.)

**Kekek**; river, tributary to Migiskan river, Pontiac county, Que.

**Kekeko**; lake, southeast of Abitibi lake, Timiskaming county, Que.

**Kekekwa**; lake, north of Anzhekumming lake, Kenora district, Ont.

**Kekeo**; river, tributary to Manuan R., upper St. Maurice R., Champlain county, Que.

**Kekkekwabi**; lake, Stanhope Tp., Haliburton Co., Ont. (Not Cay-ka-quab-be-kung.)

**Kelsall**; lake, discharging into Chilkat river, Cassiar district, B.C.

**Kelvin**; island, lake Nipigon, Thunder Bay district, Ont. (Not Grand.)

**Kelvin**; lake, an expansion of Nottaway river, Abitibi territory, Que.

**Kelvingrove**; post office, Huntingdon Co., Que. (Not Calvin Grove nor Kelvin Grove.)

**Kematch**; river, tributary to Woody river, western Manitoba.

**Kempenfelt**; bay, in lake Simcoe, Simcoe county, Ont. (Not Kempenfeldt.)

**Kempt**; lake, St. Maurice county, Que. (Not Wabaskoutyunk.)

**Kemptown**; village, Colchester county, N.S. (Not Kempt Town.)

**Kemptville**; creek, tributary to Rideau R., Grenville Co., Ont. (Not South Rideau R.)

**Kenemich**; river, flowing to Melville lake, Ashuanipi territory, Que. (Not Kenemichic.)

**Keniapiskau**; lake, north of Opatawaga L., Abitibi territory, Que. (Not Kaniapiskau.)

**Kenilworth**; lake, in Tp. 50, R. 4, W. 4th M., Alberta.

**Kennabutch**; lake, east of Dinorwic lake, Kenora district, Ont. (Not Kennabuch.)

*Ken-ne-big.* See Kennibik.

*Ken-ne-ses.* See Kennisis.

**Kennewapekko**; lake, south of Boyer lake, Kenora district, Ont.

**Kennibik**; lake, Dudley township, Haliburton county, Ont. (Not Ken-ne-big.)

**Kennicott**; lake, at head of Hackett river, Cassiar district, B.C.

**Kennisis**; lake, Havelock township, Haliburton county, Ont. (Not Ken-ne-ses.)

**Kenny**; lake, west of lake Tempest, Thunder Bay district, Ont.

**Kenogami**; lake, township and village, Chicoutimi county, Que.

**Kenogami**; river, tributary to Albany river, Algoma and Thunder Bay districts, Ont.

*Kenogamissee.* See Larch.

**Kenoniska**; lake, north of Opatawaga lake, Abitibi territory, Que.

**Kenora**; district and town, western Ontario. (Not Rat Portage town.)

**Kenora**; lake, Redditt township, Kenora district, Ont.

**Kenozhe**; lake, south of Machawaian lake, Patricia district, Ont.

**Kenozhe**; lake, southeast of Manitou lake, Kenora district, Ont. (Not Kinoje.)

**Kerkeslin**; mountain, south of Mt. Hardisty, east of Athabaska river, Alta.

**Kernertut**; cape, southeast shore of Ungava bay, New Quebec.

**Kerr**; bay and point, north shore of Amherst island, Lennox county, Ont. (Not Carrs cove nor Fish point.)

**Kerr**; mount, President range, Rocky mountains, Kootenay district, B.C.

**Kerr**; rocks off the western coast of Digby island, Coast district, B.C.

**Kersey**; point, at northern end of Maitland I., Douglas channel, Coast district, B.C.

**Kerwood**; post village and railway station, Middlesex county, Ont. (Not Kerrwood.)

**Keshkabuon**; island, Thunder bay, Thunder Bay district, Ont. (Not Caribou.)

**Kestrel**; rock, at entrance to Prince Rupert harbour, Coast district, B.C.

**Ketch**; harbour and head, also Ketch Harbour, post settlement, southwest of entrance to Halifax harbour, Halifax county, N.S. (Not Catch harbour and head, nor White nor Catch Harbour head.)

*Ketchacum.* See Catchacoma.

**Ketchum**; lake, north of Telegraph Creek village, Cassiar district, B.C.

**Kettle**; point, and reef N. from the point, Lambton county, Ont. (Not Ipperwash.)

**Kettle**; range of mountains and river, Osoyoos and Similkameen districts, B.C.
*Kettle.* See Chaudière.
**Ketza**; river, tributary to Pelly river, above Ross river, Yukon. (Not Kitza.)
**Kewagama**; lake, southeast of Abitibi lake, Timiskaming county, Que.
*Kewagodoongojioon.* See La Pause.
**Key**; harbour and railway terminus, Georgian bay, Parry Sound district, Ont.
**Keys**; lake, north of Favel lake, Kenora district, Ont.
*Khartum.* See Hector.
**Kiamika**; lake, river, township and village, Labelle county, Que.
**Kiask**; river, south of Kamshigama river, Abitibi territory, Que.
*Kickendatch.* See Kikendatch
**Kicking Horse**; pass, and river tributary to Columbia river, Kootenay district, B.C. (Not Wapta river.)
**Kid**; creek, tributary to Goat river, Kootenay district, B.C.
**Kiekkiek**; lake, Bosquet township, Timiskaming, Que. (Not Keec nor Kee-ec-kee-ec.)
*Kieley.* See Coyle.
*Ki-ette.* See Kaiete.
**Kiemawisk**; lake, southwest of Shabogama lake, Timiskaming county, Que.
*Kienawisik.* See De Montigny.
**Kikendatch**; Indian village, upper St. Maurice river, Champlain county, Que. (Not Kirkendatch nor Kickendatch.)
**Kikomun**; creek, tributary to Kootenay river, north of Waldo, Kootenay district, B.C. Not Kitamin, Kokamun, Mud nor Rock.)
**Kildala**; arm, near Kitimat arm, Coast district, B.C.
**Kildala**; river, flowing into Kildala arm of Douglas channel, Coast district, B.C.
**Killarney**; village, on west side of Lower Arrow lake, Kootenay district, B.C.
**Killenbeck**; lake, Lansdowne township, Leeds county, Ont. (Not Killingbeck.)
**Killsquaw**; lake, northwest of Tramping lake, Sask.
**Kilpatrick**; mount, Purity range, Selkirk mountains, Kootenay district, B.C.
**Kilvert**; lake, south of Hawk lake, Kenora district, Ont.
**Kimball**; lake, Livingstone township, Haliburton county, Ont. (Not Kimball's.)
**Kimmewin**; lake, southwest of Schist lake, Kenora district, Ont.
**Kinahan**; islands, S. of Digby I., Chatham sound, Coast dist., B.C. (Not Kinnahan.)
**Kinaskan**; lake, a source of Iskut river, Cassiar district, B.C. (Not Iskut.)
**Kinbasket**; lake, an expansion of Columbia river, below Bush river, Kootenay district, B.C.
**Kincardine**; town, Bruce county, Ont.
**King**; mount, northwest of Ottertail station, Kootenay district, B.C.
*King Christian.* See Findlay.
**Kingcome**; inlet and mts., W. of Knight inlet, Coast district, B.C. (Not Kingcombe.)
**Kingcome**; point, at N. end of Princess Royal I., Coast dist., B.C. (Not Kingcombe.)
**King George**; sound, south shore of Hudson strait, New Quebec.
**Kingham**; river, Argenteuil county, Que. (Not Kingsey.)
**Kinglake**; post office, Norfolk county, Ont. (Not King Lake.)
King Oscar land. See Ellesmere.

**Kingscote**; lake, Bruton township, Haliburton county, Ont.

**Kingscourt**; railway junction, Lambton Co., Ont. (Not King's Court.)

*Kingsey.* See Kingham.

**Kingsgate**; railway station, international boundary, Kootenay district, B.C.

**King Solomon**; mountain, east of Carmi, Similkameen district, B.C.

**King William**; island, S.W. of Boothia pen., N.W.T. (Not King William Land.)

**Kinney**; lake, at the southwest base of Mt. Robson, Cariboo dist., B.C. (Not Helena.)

**Kinnickoneship**; lake, near Manitou L., Kenora district, Ont. (Not Black Sawbill.)

**Kinnyu**; lake, east of Manitou lake, Kenora district, Ont.

*Kinoje.* See Kenozhe.

**Kinojevis**; lake and river, Timiskaming county, Que. (Not Kinojeviskaskatik.)

**Kinonge**; river, Petite-Nation seigniory, Labelle county, Que. (Not Salmon.)

**Kinsman**; settlement, Kings county, N.S. (Not Kinsman's.)

**Kintail**; village, south of Clark point, Huron county, Ont.

**Kipawa**; lake and river, Timiskaming county, Que. (Not Keepawa nor Kipewa.)

**Kipling**; reef, west of Middle Duck island, Manitoulin district, Ont.

**Kipp**; coulée, north of Middle coulée, southern Alberta. (Not Kipp's.)

**Kirby**; creek, flowing into Juan de Fuca strait, Vancouver I., B.C. (Not Coal.)

**Kirk**; island, in northern portion of lake Evans, Abitibi territory, Que.

*Kirkendatch.* See Kikendatch.

**Kirk Ferry**; village, Hull township, Ottawa county, Que. (Not Kirk's Ferry.)

**Kirkpatrick**; lake, south of Hamilton lake, southeastern Alberta.

**Kishikas**; lake and river, tributary to Severn river, Patricia district, Ont. (Not Cedar, Kee-she-kas nor Kishki.)

**Kishinena**; creek and mountain, international boundary, Kootenay district, B.C. (Not Kishenehn, Kish-e-neh-na nor Kish-e-nehu.)

*Kishki.* See Kishikas.

**Kiskitto**; lake, north of L. Winnipeg, Man. (Not Grass nor West Niskitogisew.)

**Kiskittogisu**; lake, north of L. Winnipeg, Man. (Not Big Reed nor Niskitogisew.)

*Kiskopkechewans.* See Minnehaha.

**Kispiox**; river, tributary to Skeena river, above Hazelton, Cassiar district, B.C (Not Kispyox nor Kis-py-ox.)

**Kisseynew**; lake, south of Kississing lake, Manitoba. (Not Lobstick.)

**Kississing**; lake and river, tributary to Churchill river, Manitoba. (Not Cold, Kissisino, nor Takipy.)

*Kitamin.* See Kikomun.

**Kitchener**; island, W. of Cockburn I., Manitoulin dist., Ont. (Not Little Cockburn.)

**Kitchener**; railway station, Kootenay district, B.C.

**Kitchigama**; river, trib. to Nottaway R., Abitibi territory, Que. (Not Michagama.)

**Kitgargas**; village, on Babine river near its junction with the Skeena, Cassiar district, B.C. (Not Kitgargasse.)

*Kitigtung.* See Lady Franklin.

**Kitimat**; arm, N. of Douglas channel, Coast district, B.C. (Not Kitamaat.)

**Kitiwiti**; shoal, southwest of Prospect, Halifax county, N.S. (Not Kittee Wittee.)

**Kitkiata**; Indian village, Douglas channel, Coast district, B.C. (Not Kit-kia-tah.)

**Kitsalas**; cañon and town, on Skeena river, Coast district, B.C. (Not Kitselas.)

*Kitselas.* See Kitsalas.

**Kitsumgallum**; lake and river, tributary to Skeena river, Coast district, B.C. (Not Kitsumgalum nor Kit-sum-kay-lum.)

**Kitty**; shoal, S. of Great Duck I., and S.W. from Mary shoal, Manitoulin district, Ont.

**Kitwanga**; village, on Skeena river, 20 miles below Hazelton, Cassiar district, B.C.

*Kitza.* See Ketza.

**Kiwanzi**; brook, tributary to Burntwood river, Manitoba.

**Kiwetinok**; pass, peak, river and valley, north of Amiskwi river, Rocky mountains, Kootenay district, B.C. (Not Mt. Kauffman, Wilson pass nor Whymper pass.)

**Kiyiu**; lake, southeast of Opuntia lake, southern Saskatchewan. (Not Eagle.)

*Kla-anch.* See Nimpkish.

**Klatsa**; river, tributary to Frances river, Yukon. (Not Klatsatooa.)

**Klemtu**; passage and village, Coast district, B.C. (Not Klemtoo nor China Hat.)

**Klesilkwa**; river, tributary to Skagit river, Yale district, B.C.

**Klewi**; river, tributary to Little Buffalo river, south of Great Slave lake, N.W.T. (Not Tesse-Clewee.)

**Kloiya**; bay, Denise arm, Morse basin, E. of Kaien I., Coast dist., B.C. (Not Cloyah.)

**Klokhok**; river, tributary to Takhini river, Yukon.

**Klondike**; village, and river tributary to Yukon river, Yukon. (Not Klondyke, Clondyke nor Thron-diuck.)

**Klootchman**; cañon, on Stikine river, south of Clearwater river, Cassiar district, B.C. (Not Kluchman.)

**Klotassin**; river, tributary to Donjek river, Yukon.

**Klotz**; mount, near Tatonduk river, Yukon.

**Kluane**; lake and river, in southwestern Yukon. (Not Kluahne.)

**Kluatantan**; river, headwaters of Skeena river, Cassiar district, B.C. (Not Klua-Tan-Tan.)

*Kluchman.* See Klootchman.

**Kluhini**; river, flowing out of Frederick lake into Dezadeash lake, Yukon.

**Klukshu**; lake, and river tributary to Alsek river, Yukon.

**Klusha**; creek, flowing through Braeburn lake, into Nordenskiöld river, Yukon.

**Knapp**; lake, north of Cheslatta lake, at head of Nechako river, Coast district, B.C.

**Knapp**; point, also Knapp Point lightstation, north shore of Wolfe island, Frontenac county, Ont. (Not Brown's.)

**Knee**; hills, between Kneehills and Threehills creeks, southern Alberta.

**Kneehill**; hamlet, east of Innisfail station, Alberta. (Not Knee Hill Valley.)

**Kneehills**; creek, tributary to Red Deer river, Alberta. (Not Knee Hills.)

**Kneeland**; bay, southwest shore of Frobisher bay, N.W.T.

**Knife**; islands, west of Shute point, Bruce county, Ont.

**Knife**; lake, international boundary, Rainy River district, Ont.

*Knight.* See Deseanso.

**Knob**; lake, Rugby township, Kenora district, Ont.

*Knob.* See The Knob.

**Koak**; islands and stream, St. John river, York county, N.B. (Not Coac nor Coak.)

**Koidern**; river, tributary to White river, Yukon.

*Kokamun.* See Kikomun.

*Koketsa.* See Kaketsa.

**Kokomenhani**; lake, at headwaters of Rupert river, Mistassini territory, Que. (Not Kokhamenhani.)

**Kokomis**; lake, southwest of Grand lake Victoria, Timiskaming county, Que.

**Koksilah**; railway station, ridge and river, N. of Cowichan R., Vancouver I., B.C.

**Koksoak**; river, flowing into Ungava bay, New Quebec. (Not Big nor South.)

**Kolfage**; island, south of Pike point, Bruce county, Ont.

**Koochiching**; falls, in Rainy river, near Fort Frances, international boundary, Rainy River district, Ont. (Not Chaudière.)

*Koos-ka-nax.* See Kuskanax.

*Kootanie.* See Blakiston.

*Kootenai.* See Waterton.

**Kootenay**; lake and river, Kootenay district, B.C. (Not Kootanie, Kootenai, &c.)

**Kopka**; lake, west of lake Nipigon, Thunder Bay district, Ont.

**Korikduardu**; inlet, E. of Chorkbak inlet, Hudson strait, N.W.T. (Not Ko-rick-du-ar-du.)

**Koshin**; river, tributary to Nahlin river, Cassiar district, B.C.

**Koya**; point, also lightstation on the point, east of Langford point, N.E. entrance to Houston Stewart channel, Coast district, B.C.

**Kramer**; lake, Redditt township, Kenora district, Ont.

**Kukukahu**; lake, southeast of Manitou lake, Kenora district, Ont.

**Kukukus**; lake, southeast of Minnitaki lake, Kenora district, Ont. (Not Kukus.)

**Kuldo**; creek and village, Skeena river, 46 miles above Hazelton, Cassiar dist., B.C.

**Kulleet**; bay, northeast of Ladysmith harbour, Vancouver island, B.C. (Not Chemainos nor Chemainus.)

**Kunghit**; island, Queen Charlotte islands, Coast district, B.C. (Not Prevost.)

**Kuper**; island, northwest of Saltspring island, southeast coast of Vancouver island, B.C. The name "Kuper" is confirmed for this island and replaced by "Hibben" for the northerly one to avoid duplication.

*Kuper.* See Hibben.

**Kusawa**; lake, southwest of lake Laberge, Yukon. (Not Arkell.)

**Kusawa**; river, flowing northerly from Cassiar district, B.C., into Kusawa lake, Yukon. (Not Arkell.)

**Kushog**; lake, Stanhope township, Haliburton county, Ont. (Not Hall's nor Kah-wah-she-be-mah-gog.)

*Kusiwah.* See Surprise.

**Kuskanax**; creek, E. side of Upper Arrow L., Kootenay dist., B.C. (Not Koos-ka-nax.)

**Kuskonook**; post office, near the southern end of Kootenay lake, Kootenay district, B.C. Not Kuskanook.)

**Kutawagan**; lake, Tp. 30, R. 20, W. 2 M., southern Saskatchewan.

**Kuthai**; lake, discharging into Silver Salmon river, Cassiar district, B.C.

**Kwadacha**; river, tributary to Finlay river, Cassiar district, B.C. (Not Quadacha nor Quaneca.)

*Kwichpak.* See Yukon.

**Kwinitsa**; railway station, also river tributary to Skeena R., B.C. (Not Quinitsa.)

**Kwoiek**; peak, west of Kanaka, Yale district, B.C. (Not Quoieek.)

**Kyak**; bay, west coast of Ungava bay, New Quebec.

**Kyaska**; lake, on Churchill river, east of Reindeer river, central Saskatchewan.

*Kyeet.* See Kaiete.

## L

**Laberge**; lake, in the southern portion of Yukon. (Not Labarge nor Lebarge.)

**Laberge**; lake, Pontleroy township, Timiskaming county, Que. (Not Lizard.)

**La Biche**; lake and river, central Alberta. (Not Red Deer.)

**Labrador**; reef, north of cape Chidley, New Quebec.

**Labrador**; reef, south of Bélanger point, Manitoulin island, Manitoulin district, Ont.

**Labyrinth**; lake, on interprovincial boundary, Timiskaming, Ont. and Que.

**Lacaille**; point and river, Montmagny county, Que. (Not la Caille.)

**La Chapelle**; hamlet, Two Mountains county, Que. (Not Lachapelle.)

*L'Achigan.* See Achigan.

*La Colle.* See Cole.

**La Croix**; lake, Int. boundary, Rainy River district, Ont. (Not Namoukan nor Nequaquon.)

**Lacroix**; lake, in the valley of Bulkley river, Cassiar district, B.C. (Not La Croix, Le Croix nor Round.)

**Lacroix**; lake, southeast of lac La Biche, central Alberta.

**Lac-Sergent**; hamlet, Portneuf county, Que. See also Sergent.

**Ladder**; hill and lake, southeast of Cowan lake, central Saskatchewan.

**Ladue**; river, tributary to White river, Yukon.

**Lady Beatrix**; lake, northeast of Mattagami lake, Abitibi territory, Que.

**Ladybird**; mountain, N. of Columbia R., Kootenay district, B.C. (Not Lady Bird.)

**Lady Franklin**; island, near Baffin island, N.W.T. (Not Kitigtung.)

**Ladysmith**; harbour and town, southeast coast of Vancouver island, B.C. (Not Oyster harbour.)

**LaFrance**; creek, east side of Kootenay lake, Kootenay district, B.C. (Not Lafrance.)

**Lagoon**; head, south entrance to Hammond bay, S.E. coast of Vancouver island, B.C.

**Lahave**; island and river, Lunenburg county, N.S. (Not La Have nor Le Havre.)

**Lake**; creek, flowing into Lardeau river, at Poplar, Kootenay district, B.C.

**Lake**; creek, tributary to Stewart river, Yukon.

*Lake.* See Chonat.

**Lake Fleet**; group of islands, E. of Admiralty group, St. Lawrence R., Leeds Co. Ont.

**Lakelse**; lake and river, tributary to Skeena river, Coast district, B.C. (Not Lekelse.)

*Lake Megantic.* See Megantic.

*Lake of Islands.* See Dufault lake.

*Lake of the Narrows.* See Washi lake.

**Laketon**; post, on Dease lake, Cassiar district, B.C.

**Lakit**; creek, E. of Kootenay R., N. of Steele, Kootenay dist., B.C. (Not Four-mile.)

*La Lime* See Lanim.

*La Loche.* See Methye.

**Lalonde**; island, St. Lawrence river, Soulanges county, Que. (Not Chateauguay.)

**L'Amable**; brook and lake, Dungannon and Faraday townships, Hastings county, Ont.

*La Macaza.* See Macaza.

**Lamb**; creek, tributary to Moyie river, Kootenay district B.C.

**Lambert**; shoal, northwest of Saugeen river, Bruce county, Ont.

**Lamek**; bay, Shippigan island, Gloucester county, N.B. (Not Alemek, Lamec, L'amec nor Lameque.)

**La Motte**; lake, La Motte and Malartic townships, Timiskaming county, Que. (Not Askikwaj nor Seals Home.)

**Lamy**; lake, Sabourin township, Timiskaming county, Que. (Not Atikamek.)

**Landels**; river, tributary to Winefred river, eastern Alberta. (Not Grizzly Bear.)

**Landing**; lake, north of Sipiwesk lake, Manitoba.

**Langara**; island, off the northern extreme of Graham island, Queen Charlotte group; also point on the island, midway between Thrumb island and St. Margaret point, with lightstation thereon; name also applied to rocks off the north shore of the island; Coast district, B.C. (Not North island nor North point.)

The island was named North by Capt. George Dixon in 1787; and Langara by Commander Jacinto of the Spanish corvette "Aranzazu", 1792, after Admiral Don Juan de Langara of the Spanish navy and the point was called North by Vancouver, 1793. Walbran's "British Columbia Coast Names." The name "North" removed as not being sufficiently distinctive.

*L'Ange Gardien.* See Canrobert.

**Langford**; lake, west of Esquimalt, Vancouver island, B.C.

*Langlais.* See Langlois.

**Langlois**; point, at mouth of Grande rivière du Chêne, Lotbinière county, Que. (Not Langlais.)

**Lanim**; point, west of Dalhousie, Restigouche county, N.B. (Not La Lime, nor La Nim, nor Le Nim.)

**L'Annonciation**; parish, Labelle county, Que.

**La Nonne** (lac); lake, Tp. 57, Rs. 2 and 3, W. 5th M., Alberta.

*L'Anse au Beaufils.* See Anse-à-Beaufils.

*L'Anse-à-Valleau.* See Anse-au-Vallon.

**Lansdowne**. mount, west of lake Marsh, Yukon.

**Lansing**; river, tributary to Stewart river, Yukon.

**La Pause**; lake, La Pause township, Timiskaming Co., Que. (Not Kewagodoongojioon.)

**Lapêche**; lake and river, tributary to Gatineau river, Ottawa and Pontiac counties, Que.

**Lapie**; river, tributary to Pelly river, below Ross river, Yukon.

**Laplante**; post village, Gloucester county, N.B. (Not LaPlante.)

**Larch**; river, tributary to Koksoak river, New Quebec. (Not Kenogamissee.)

**Lardeau**; creek, flowing into the head of Trout lake, Kootenay district, B.C.

**Lardeau**; mining division, Kootenay district, B.C. (Not Lardo.)

**Lardeau**; mountains, east of Upper Arrow lake, Kootenay district, B.C.

**Lardeau**; river, tributary to Duncan river, Kootenay district, B.C. (Not Lardo.)

**Lardeau**; town, at north end of Kootenay lake, B.C. (Not Lardo.)

**Larder**; lake, S. of Abitibi L., Timiskaming district, Ont. (Not Present nor President.)

*Lardo.* See Lardeau.

*Lardo.* See Purity.

**L'Ardoise**; village, Richmond county, N.S. (Not Ardoise.)

*Large.* See Hamilton.

*Large Trout.* See Hector.

**LaRivière**; village, Lisgar electoral district, Man. (Not Larivière.)

**Lark**; islet, northeast of pointe aux Alouettes, entrance to Saguenay river, Saguenay county, Que. (Not Ile aux Morts.)

*Lark.* See Alouettes.

*La Ronde.* See Rond.

**La Ronge** (lac); lake, south of Churchill river, central Saskatchewan.

**Larry**; rock, south of Great Duck I., and west of Kitty shoal, Manitoulin district, Ont.

*Lartigue.* See Lois.

**La Salette**; town, Norfolk county, Ont. (Not La Sallette nor Lasallette.)

**La Sarre**; river, flowing from Makamik lake to Abitibi lake, Timiskaming county, Que. (Not Amikitik nor Whitefish.)

**Lash**; island, E. of Dead I., entrance to Key harbour, Parry Sound district, Ont.

**Lasher**; island, south of Shesheeb point, Thunder Bay district, Ont.

**Laskay**; post village, York county, Ont. (Not Laskey.)

*Lasketti.* See Lasqueti.

*Lasquely.* See Lasqueti.

**Lasqueti**; island, south of Texada island, strait of Georgia, New Westminster district, B.C. (Not Lasquely nor Lasketti.)

**Last-chance**; creek, branch of Hunker creek, Klondike river, Yukon.

**La Tabatière**; bay and post office, Boishébert township, Saguenay county, Que.

**Latchford**; town, on Montreal river, Timiskaming district, Ont.

*La Tete.* See Walton.

**Laura**; creek, tributary to Klondike river, Yukon.

**Laura**; mount, near lower Stikine river, north of Iskut river, Cassiar district, B.C.

**Laurie**; lake in Duck Mountain Forest reserve, western Manitoba.

**Laurie**; range of mountains, west of O'Donnel river, Cassiar district, B.C.

**Laurier**; cove, in upper portion of Prince Rupert harbour, Coast district, B.C.

**Laurier**; lake, Pettypiece township, Kenora district, Ont.

**Laurier**; mount, east of lake Laberge, Yukon.

**Laurier**; river, emptying into the east end of Clinton-Colden lake, northeast of Great Slave lake, N.W.T.

**Laussedat**; mount, S. of Mt. Freshfield and N.E. of Donald, Kootenay district, B.C.

**Lavallée**; lake, northwest of Crean lake, central Saskatchewan. (Not Pelican.)

**Lavina**; mountain, north of Kootenay lake, Kootenay district, B.C.

**Lavington**; creek, tributary to Findlay creek, Kootenay district, B.C. (Not South Fork of Findlay creek.)

**Lawrence**; lake, north of De Laronde lake, central Saskatchewan. (Not Caribou.)

**Lawrence**; lake, south of L. Winnipegosis, Man.

**Lazy**; lake, east of Kootenay R., north of Steele, Kootenay district, B.C. (Not Rock.)

**Leach**; creek, flowing northerly into Michel creek, Kootenay district, B.C. (Not South Branch or Fork of Michel creek.)

*Leading peak.* See mount Finlayson.

**Leaf**; bay, lake and river, south coast of Ungava bay, New Quebec. (Not Nepihjee river.)

**Leah**; peak, northwest of Samson peak, Rocky mountains, western Alberta.

*Leak.* See Thwartway.

**Leanchoil**; railway station, Kootenay district, B.C.

**Leary**; cove and point, entrance to Blind bay, Halifax county, N.S. (Not Leary's.)

**Leask**; bay and point, South bay, Manitoulin district, Ont.

**Leather**; river, tributary to Carrot river, Saskatchewan. (Not Hanging Hide.)

*Lebarge.* See Laberge.

**Leboeuf**; bay, Gabriola island, S.E. coast of Vancouver I., B.C. (Not Lebeuf.)

**Lebret**; lake, an expansion of Qu'Appelle river, above Katepwe lake, in the chain of the "Fishing lakes"; also settlement; Sask.

*Le Croix.* See Lacroix.

**Leda**; peak, near "Castor and Pollux," east of mount Swanzy, Selkirk mountains, Kootenay district, B.C.

**Lee**; bank, north of Saugeen river, Bruce county, Ont.

**Lee**; creek, tributary to St. Mary river, southern Alberta. (Not Lee's.)

**Leech**; river, tributary to Sooke river, Vancouver island, B.C.

*Leek.* See Thwartway.

**Lefroy**; mount, also glacier, in the Bow range of the Rockies, Alta. and B.C.

*Leg.* See Muldrew.

**Léger**; settlement, Westmorland county, N.B. (Not Legre Corner nor Legers Corners.)

*Legère Corner.* See Léger.

*Le Havre.* See Lahave.

**LeHeu**; point, below Murray Bay, Charlevoix county, Que.

*Lekelse.* See Lakelse.

**Lelu**; island, northwest of Smith island, Chatham sound, Coast district, B.C. (Not Le-loo nor South Porpoise.)

**Leman**; river, tributary to Bersimis river, Saguenay county, Que.

**Lemoine**; lake, Desroberts, Dubuisson and Laubanie townships, Timiskaming county, Que. (Not Kakinokamak.)

*Le Nim.* See Lanim.

**Lenore**; lake, north of Humboldt, Saskatchewan.

**Leon**; settlement, east side of Upper Arrow lake, Kootenay district, B.C. (Not Leon Hot Springs.)

**Leonard**; island, St. Lawrence river, Soulanges county, Que. (Not Grand Batture.)

**Leonard**; mount, west of Surprise lake, Cassiar district, B.C.

**Leopold**; point, Markham bay, Hudson strait, N.W.T.

**Leotta**; creek, tributary to Klondike river, Yukon.

*Le Pas.* See Pas.

**Lepreau**; basin, harbour, parish, point, river and village, Charlotte county, N.B. (Not Lepreaux nor Belas basin.)

*Leroux.* See Hill.

*Les Bergeronnes.* See Bergeronnes.

**Lescarbot**; lake, Quebec county, Que. (Not Kamamintigongue.)

**Lesser Slave**; lake and river, central Alberta. (Not Slave.)

**Lester**; lake, Haycock township, Kenora district, Ont.

**L'Etang**; harbour, river, and village, Charlotte county, N.B. (Not Etang nor Letang.)

*L'Etete.* See Letite.

**Letite**; passage and village, Charlotte county, N.B. (Not L'Etete nor Letete.)

**Lève**; lake, Radcliffe township, Renfrew county, Ont.

*Levi.* See Holliday.

**Lewes**; lake, near the "big bend" of Watson river, and river tributary to Yukon river, Yukon. (Not Lewis.)

**Lewes**; mount, north of lake Laberge, Yukon. (Not River mountain.)

**Lewis**; creek, east of Kootenay river, north of Steele, Kootenay district, B.C.

**Lewis**; island, between Kennedy and Porcher islands, Coast district, B.C.

**Lewis**; lake, northeast of Tawatinaw lake, Kenora district, Ont.

**Lewis**; lake, Ross river, Yukon.

*Lewis.* See Crease.

*Lewis.* See Lewes.

*Lewis.* See Louis.

**Liard**; river, tributary to Mackenzie R., B.C., N.W.T. and Yukon. (Not Mountain.)

**Lichfield**; shoal, W. entrance to Halifax harbour, Halifax Co., N.S. (Not Litchfield.)

**Lièvres** (île aux); island, St. Lawrence river, Temiscouata county, Que. English usage: Hare island, which see.

*Lighthouse.* See Snake.

**Lilian**; lake and river, tributary to the Assiniboine, eastern Saskatchewan. (Not Etoimami South.)

**Lillooet**; district, river and town, B.C.

*Lillooet.* See Alouette.

**Lily**; bay, also Lily Bay, P.O., east shore of lake Manitoba, Man.

**Lily**; bay, upper Ottawa river, west of Grand L. Victoria, Timiskaming county, Que

**Lily**; glacier, and pass, north of mount Swanzy, Selkirk Mts., Kootenay district, B.C.

**Lily**; lakes, on international boundary, Thunder Bay district, Ont.

**Lima**; point, S. extreme of Digby I., W. entrance to Prince Rupert harbour, B.C.

**Limebank**; village, Carleton county, Ont. (Not Lime Bank.)

**Limestone**; lake, Mayo township, Hastings county, Ont.

**Limestone**; point, Nipisiguit bay, Gloucester county, N.B. (Not Young's.)

*Limestone.* See Dolomite.

**Lina**; range of mountains, east of Atlin lake, Cassiar district, B.C.

**Linda**; lake, northeast of mount Odaray, Rocky mountains, Kootenay district, B.C.

**Lindal**; lake, Pettypiece township, Kenora district, Ont. (Not Lindel.)

**Lindeman**; lake, south of Bennett lake, Cassiar district, B.C. (Not Linderman nor Lyndeman.)

*Lindoe.* See Lynedoch.

**Lindsay**; island, Admiralty group, St. Lawrence river, Leeds county, Ont. (Not Cut.)

**Line**; creek, tributary to Fording river, Kootenay district, B.C.

**Line**; lake, southwest of Eagle lake, Kenora district, Ont.

**Lineham**; creek, tributary to Sheep river, southern Alberta.

**Link**; island, near Dodd narrows, east coast of Vancouver island, B.C.

**Link**; lake, Strathy township, Nipissing district, Ont.

**Linklater**; creek, tributary to Kootenay river, near international boundary, Kootenay district, B.C. (Not Linkwater nor Meadow.)

**Linklater**; lake, east of Willard lake, Kenora district, Ont.

*Linkwater.* See Linklater.

**Lionhead**; harbour, headland, and village, Eastnor township, Bruce county, Ont. (Not Lion Head nor Lion's Head.)

**Lionnet**; river, tributary to Bersimis river, Saguenay county, Que.

**Liscomb**; harbour and post village, Guysborough county, N.S. (Not Liscombe.)

**Liskeard**; town, Timiskaming district, Ont. (Not New Liskeard.)

*L'Isle.* See Delisle.

**Listowel**; town, Perth county, Ont. (Not Listowell.)

*Litchfield.* See Lichfield.

**Little**; mount, west of mount Fay, Bow range of the Rockies, Alberta and Kootenay district, B.C.

**Little**; rock, southwest of Phœbe point, Fitzwilliam island, Manitoulin district, Ont.

*Little.* See Rough.

**Little Atlin**; lake, betweeen Atlin lake and lake Marsh, Yukon.

*Little Black.* See Bélanger.

*Little Black.* See Burton.

**Little Blanche**; creek, branch of Quartz creek, Indian river, Yukon.

**Little Boshkung**; lake, Minden township, Haliburton county, Ont.

**Little Bow**; river, tributary to Oldman river, Alberta. (Not Small.)

**Little Bras d'Or**; the narrow channel, east of Boularderie island, leading into St. Andrew channel, from the Atlantic, Cape Breton county, N.S. The name 'Little Bras d'Or lake' to be dropped.

*Little Brazeau.* See Nordegg.

*Little Candle.* See Torch.

*Little Cedar.* See Pakhoan.

*Little Charlton.* See Trodely.

*Little Cockburn.* See Kitchener.

*Little Cranberry.* See Traverse.

*Little Cutarm.* See Kaposvar.

**Little Don**; river, tributary to Don river, York county, Ont. (Not Don.)

*Little Fishing.* See Peck.

*Little Flatland.* See Campbell.

*Little Fork.* See Gunamitz.

*Little Fork of the Saskatchewan.* See Mistaya.

**Little-gem**; creek, branch of Hunker creek, Yukon.

*Little Grant.* See Pearson.

*Little Green.* See Steevens.

*Little Island.* See Ministikwan.

*Little Jackfish.* See Foreleg.

**Littlejohn**; island, Admiralty group, St. Lawrence river, Leeds county, Ont.

**Little Knife**; portage, between Knife and Cypress lakes, Rainy River district, Ont.

*Little Loran.* See Little Lorembec.

**Little Lorembec**; post settlement, midway between Lorembec and Cape Breton, Cape Breton county, N.S. (Not Little Loran nor Little Lorraine.)

*Little Lorraine.* See Little Lorembec.

**Little Madawaska**; river, E. side of Algonquin National park, Nipissing district, Ont.

*Little Magog.* See Magog.

*Little Mecattina.* See Mekattina.

*Little Metascouac.* See Barrès.

*Little (or South) Miminigash.* See Roseville.

*Little Mistassini.* See Albanel.

*Little Musquodoboit.* See Elderbank.

*Little Natashquan.* See Natashkwan.

*Little Nation.* See South Nation.

*Little Nipisiguit.* See Millstream.

*Little Nottaway.* See Broadback.

*Little Roger.* See Gaboury.

*Little Opeongo.* See Aylen.

*Little Pelican.* See Suggi.

*Little Quill.* See Quill.

*Little Red.* See Spruce.

*Little River Musquodoboit.* See Elderbank.

*Little Sachigo.* See Oponask.

**Little Salmon**; river, tributary to Lewes river, Yukon.

*Little Sandy.* See Athol.

*Little Saskatchewan.* See Dauphin.

*Little Saskatchewan.* See Minnedosa.

*Little Shallow.* See Pakwash.

**Little Shuswap**; lake, west of Shuswap lake, Kamloops district, B.C.

**Little Slocan**; river, tributary to Slocan river, Kootenay district, B.C.

**Little Smoky**; river, tributary to Smoky river, Alberta.

*Little Stave.* See Prince Regent.

**Little Tahltan**; river, tributary to Tahltan river, Cassiar district, B.C.

*Little Tobique.* See Sisson.

*Little Tobique.* See Tobique.

**Little Vermilion**; lake, between Loon and Sand Point lakes, international boundary, Rainy River district, Ont. (Not Vermilion.)

*Little Vermilion.* See Altrude.

*Little Wabigoon.* See Dinorwic.

*Little Weslemcoon.* See Effingham.

**Livingstone**; range of mountains and river, southern Alberta.

**Lizard**; creek and mountains, southwest of Fernie, Kootenay district, B.C.

*Lizard.* See Laberge.

**Lladnor**; creek, tributary to Elk river, north of Olson, Kootenay district, B.C.

**Llewellyn**; glacier, south of Atlin lake, Cassiar district, B.C.

*Loadstone.* See Lodestone.

**Lobster**; lake, Airy township, Nipissing district, Ont.

*Lobster.* See Crayfish.

**Lobstick**; bay, in the lake of the Woods, Kenora district, Ont. (Not Lob-stick.)

**Lobstick**; river, tributary to Pembina river, central Alberta. (Not Lob-stick.)

*Lobstick.* See Chip.

*Lobstick.* See Kisseynew.

**Lock**; bay, Gabriola island, southeast coast of Vancouver island, B.C.

**Locke**; island, Lockeport harbour, Shelburne county, N.S. (Not Ragged nor Rugged.)

**Lockeport**; harbour and town, Shelburne county, N.S. (Not Ragged Island nor Rugged Island harbour.)

**Lockhart**; river, emptying into E. end of Great Slave L., N.W.T. (Not Lockhart's.)

**Lodestone**; lake and mountain, south of Tulameen river, Yale district, B.C. (Not Loadstone mountain nor Paradise lake.)

**Lodge**; creek, southern Alberta and Saskatchewan. (Not Medicine Lodge.)

**Lodgepole**; creek, tributary to Wigwam river, Kootenay district, B.C. (Not Lodge Pole.)

**Logan**; island, in northerly portion of lake Nipigon, Thunder Bay district, Ont.

**Logan**; mount, east of Frances lake, Yukon.

**Logie**; rock, west of McNab point, Bruce county, Ont.

**Lois**; lake and river, emptying into Makamik lake, Timiskaming county, Que. (Not Lartigue, Matamik nor Molesworth.)

Loks; land, at entrance to Frobisher bay, N.W.T. (Not Lok's.)

**Lombard**; creek, tributary to Indian river, Yukon.

**Lomond**; river, emptying into L. Superior, Thunder Bay district, Ont. (Not Carp.)

*London Junction.* See Pottersburg.

**Lonely**; bay, east of Dominion point, Manitoulin island, Manitoulin district, Ont.

**Lonely**; river, flowing into bay of same name, Opasatika lake, Timiskaming county, Que. (Not Bagwah.)

*Lonely.* See Isolated.

*Lonely.* See Seul.

*Lonely Valley.* See Ten Peaks.

*Lone Man's.* See Oneman.

*Lone Tree.* See Ann.

**Long**; creek, the west branch of Souris river, southeastern Saskatchewan.

**Long**; point, extending into the central portion of lake Evans, Abitibi territory, Que.

**Long**; point, in southern part of Tyendinaga township, Hastings county, Ont.

**Long**; portage, between Rose and Watap lakes, international boundary, Thunder Bay district, Ont. (Not Great New.)

*Long.* See Farrell.

*Long.* See Kawashegamuk.

*Long.* See Lowes.

*Long.* See Methy.

*Long.* See Mountain.

*Long.* See Ord.

*Long.* See St. Andrew.

*Long.* See Trident.

*Long.* See Tyee.

*Long.* See Vaudray.

*Long.* See Wolfe.

*Long.* See Woods.

**Long-legged**; lake and river, emptying into Wilcox lake on English river, Patricia district, Ont.

**Long Point**; bay and lightstation, lake Erie, Norfolk county, Ont. (Not North Foreland nor Outer Bay of Long Point.)

**Long Sault**; rapids, below Manitou rapids, Rainy river, Rainy River district, Ont.

**Longspell**; point, near Kingsport, Kings county, N.S. (Not Indian.)

**Longue-Pointe**; village, Laval county, Que. (Not Long Point.)

**Lookout**; mountain, in the Selkirks, Kootenay district, B.C.

**Lookout**; river, emptying into Smoothrock lake, Thunder Bay district, Ont.

**Loon**; lake, between La Croix and Little Vermilion lakes, international boundary, Rainy River district, Ont.

*Loon.* See Makwa.

*Loon.* See Mang.

**Loonhead**; lake, on Burntwood river, Manitoba. (Not Loon-head)

**Loop**; brook, tributary to Illecillewaet river, near "The Loop," Kootenay district, B.C.

**Lordmills**; settlement, Grenville county, Ont. (Not Lord Mills.)

**Lorembec**; head and post settlement, about 2 miles east of Louisburg, Cape Breton county, N.S. (Not Big Loran nor Big Lorraine.)

The original form of this name was Laurentbec (See page 175 of "Cape Breton and its Memorials." by Sir John Bourinot) which survives in the neighbouring "Lawrence head"; this successively became "Laurentbec"; "Lorembec"; and "Lorembec", evidently a typographical error; "Loran", probably a corruption of Laurent; and lastly "Lorraine", evidently adopted from the name of the Rhenish province under a misconception.

*Lorenzo.* See Pelletier.

**Loretta**; island, north of Hawkesbury island, Coast district, B.C.

**Lorette**; parish, railway station and village, southeast of Winnipeg, Manitoba. (Not Loretto.)

**L'Orignal**; town, Prescott county, Ont. (Not L'Original.)

**Lorne**; lake, Pembina river, southern Manitoba.

**Lorne**; lake, Rugby township, Kenora district, Ont.

**Lorne**; mount, west of lake Marsh, Yukon.

*Lorne.* See Bendor.

**Lorneville**; village, on west side of entrance to St. John harbour, St. John county, N.B. (Not Pisarinco.)

**Lorrain**; lake, east of Cassels township, Nipissing district, Ont. (Not Bear.)

**Lorrainville**; parish and village, Timiskaming county, Que. (Not Lorraineville.)

**Loscombe**; reef, north of Macpherson point, Bruce county, Ont.

**Lost**; lake, northwest of Minnitaki lake, Kenora district, Ont.

**Loucks**; lake, Burleigh township, Peterborough county, Ont. (Not Louck's.)

**Lougheed**; bay, point and reef, east of Dominion point, Manitoulin island, Ont.

**Louis**; mount, northwest of Banff, Alberta.

**Louis**; point, south end of Coste island, Kitimat arm, Coast district, B.C.

**Louis**; port, Graham island, Coast district, B.C. (Not Ingraham nor Lewis.)

**Louisa**; lake, Lawrence township, Haliburton county, Ont.

**Louise**; lake, Pembina river, also railway station, southern Manitoba.

**Louise**; lake, west of Lake Louise railway station, Alberta. (Not Emerald.)

**Lount**; lake, English river, Kenora district, Ont.

**Loup** (banc du); bank, below Pilgrim Is., St. Lawrence R., Temiscouata Co., Que.

**Loup** (pointe du); (rivière du); point, also river tributary to the St. Lawrence, Temiscouata county, Que.

**Loutre** (Harbour de); harbour, W. side of Campobello I., N.B. (Not Harbour de Lute.)

*Loutres.* See Glaises.

**Low**; lake, southeast of Silver lake, Kenora district, Ont.

**Low**; point, and Low Point, post office, east side of George bay, Inverness county, N.S.

*Low.* See Clark.

*Low.* See Flat

**Lower Arrow**; lake, an expansion of Columbia river, Kootenay district, B.C.

*Lower Bow.* See Hector.

*Lower Clearwater.* See Washagomish.

**Lower Savage**; islands, Gabriel strait, N.W.T.

*Lower White Fish.* See Gregg.

**Lowes**; lake, southwest of Yorkton, Saskatchewan. (Not Long, Pebble, nor Silver.)

**Lubbock**; bay, west of Markham bay, Hudson strait, N.W.T.

**Lubbock**; river, flowing into Atlin lake from Little Atlin lake, Yukon.

**Lucas**; channel, island and reef, at entrance to Georgian bay, Manitoulin district, Ont.

**Lucky**; creek, branch of Allgold creek, Klondike river, Yukon.

**Luke**; creek, tributary to St. Mary river, Kootenay district, B.C.

*Luke Fox.* See Fox.

*Lumley.* See Frobisher.

**Lusk**; creek, tributary to Kananaskis river, Alberta.

**Lussier**; river, tributary to Kootenay river, Kootenay district, B.C

**Lutz**; post settlement, Westmorland county, N.B. (Not Lutes nor Lutes Mountain.)

**Lyal**; island and reef, southeast of Greenough point, Bruce county, Ont.

**Lychnis**; mountain, south of Mt. Douglas, Rocky mountains, Alberta.

**Lyell**; mount, also creek and snowfield, summit range of the Rockies, Alta. and Kootenay district, B.C.

**Lynch**; island, in the Ste. Geneviève group, east of Ste. Anne-de-Bellevue, Jacques Cartier county, Que. (Not Dowker's nor Lynch's.)

*Lyndeman.* See Lindeman.

**Lynedoch**; island, west of Hill island, St. Lawrence river, Leeds county, Ont. (Not Ash, Lindoe nor Lyndoch.)

**Lynn**; creek and lake, emptying into Burrard inlet, north of Vancouver, New Westminster district, B.C.

**Lynn**; point, Manitoulin I., N.W. of Greene I., Manitoulin dist., Ont. (Not Black.)

*Lynx*. See Selby.

**Lyster**; lake, Barnston township, Stanstead county, Que. (Not Baldwin's pond nor Barnston pond.)

## M

**Mabee**; village, Norfolk county, Ont. (Not Maybee.)

**Mabel**; lake and mountain, Kamloops and Osoyoos districts, B.C.

**Macabee**; creek, tributary to Sheep river, also mountain, southern Alberta.

**McAdam**; village, York Co., N.B. (Not Macadam nor McAdam Junction.)

**McAlpine**; village, Prescott Co., Ont. (Not McAlpine's nor McAlpin.)

*Macan*. See Maccan.

**McCann**; hill, on international boundary, in latitude 64° 55′, Yukon.

**McArthur**; creek, lake and pass, west of Columbia river; also mountain, at head of upper Yoho valley, Rocky mountains, Kootenay district, B.C.

**Macaulay**; lake, Airy township, Nipissing district, Ont.

**Macaulay**; spit, off the southeastern end of Inner Duck island, Manitoulin district, Ont. (Not McCauley's.)

**Macaza**; mission, Labelle county, Que. (Not La Macaza.)

**McBean**; mount, west of Mt. Purity, Selkirk mountains, Kootenay district, B.C.

**McCallum**; island, southeast of Beament island, Bruce county, Ont. (Not Snake.)

**McCallum**; mountains, east of Atlin lake, Cassiar district, B.C.

**Maccan**; river and village, Cumberland county, N.S. (Not Macan.)

**McCarthy**; point, southeast side of Fitzwilliam island, Manitoulin district, Ont.

**M'Clintock**; peak and river, between lake Marsh and Teslin river, Yukon. (Not McClintock.)

**McConnell**; peak and river, Nisutlin river, Yukon.

*Macoostigan*. See Makustigan.

**McCormick**; creek and landing, near foot of Lower Arrow lake, Kootenay district, B.C. (Not McCormack.)

**McCoy**; head, east of Thompson cove, St. John county, N.B. (Not McCoy's.)

**McCoy**; island, Brock group, St. Lawrence R., Leeds Co., Ont. (Not Montgomery.)

**McCreary**; island, N. of Turnagain point, L. Winnipeg, Man. (Not Outer Sturgeon.)

**McDame**; creek, tributary to Dease river, Cassiar district, B.C.

**McDonald**; bay and point, west of Brockville, Leeds county, Ont. (Not Donald, Macdonald nor McDonald's.)

**McDonald**; creek, flowing into Upper Arrow lake, Kootenay district, B.C.

**McDonald**; island, Admiralty group, St. Lawrence R., Leeds county, Ont. (Not Hog.)

**McDonald**; lake, east of Atlin lake, Cassiar district, B.C.

**McDonald**; lake, Haycock township, Kenora district, Ont.

**McDonald**; mount, west of Esquimalt, Vancouver island, B.C

**Macdonald**; island, north shore of Hudson strait, N.W.T. (Not Egypt.)

**Macdonald**; lake, Havelock township, Haliburton county, Ont. (Not Macdonald's.)

**Macdonald**; mount, in the Selkirks, Kootenay district, B.C. (Not Carroll.)

**Macdonald**; range of mountains, east of Wigwam river, Kootenay district, B.C.

*McDonald's.* See Prince Regent.

*McDonnel.* See Prinyer.

**McDougal**; brook, trib. to Incomappleux R., Kootenay dist., B.C. (Not McDougall.)

**McDougall**; mount, east of Kananaskis river, Rocky Mountains park, Alberta.

**Macdougall**; settlement, Kent county, N.B. (Not Macdougal nor Macdougall's.)

*Macdougall's.* See Marion.

**Mace**; bay, Charlotte county, N.B. (Not Mace's.)

**McElhinney**; shoal, N. of Flowerpot I., Georgian bay, Ont. (Not McElhinney's.)

**McEvoy**; creek, tributary to Flathead river, east of Morrissey, Kootenay district, B.C.

**McEvoy**; lake, northeast of Finlayson lake, Yukon.

**McEwen**; lake, east of Kawaweogama lake, Thunder Bay district, Ont.

**McFadden**; lake, M'Clintock township, Haliburton county, Ont. (Not McFadden's.)

**McFarlane**; river, emptying into the S. side of Athabaska lake, Sask. (Not Beaver.)

**McGaw**; point, entrance to S. Baymouth, Manitoulin island, Manitoulin district, Ont.

**McGillivray**; creek, flowing southeasterly into Anderson lake, also mountain and pass at the head of the creek, Lillooet district, B.C. (Not McGillvray.)

**McGillivray**; hamlet, Middlesex county, Ont. (Not West McGillivray.)

*McGillvray.* See McGillivray.

**McGinnis**; creek, flowing into the lake of the Woods, Spohn township, Rainy River district, Ont. (Not McInnis.)

**McGrath**; mount, near lower Stikine R., north of Iskut R., Cassiar district, B.C.

**MacGregor**; point, west of Port Elgin, Bruce county, Ont.

**McGregor**; settlement, east shore of Kootenay lake, south of Lockhart creek, Kootenay district, B.C. (Not McGregor's.)

*Macha.* See Hatchau.

**Machawaian**; lake, southwest of Attawapiskat lake, Patricia district, Ont.

**McHugh**; brook, flowing into Dinorwic L., Kenora dist., Ont. (Not McHugh creek.

**McInnes**; hamlet, Middlesex county, Ont. (Not McInness.)

*McInness.* See McInnes.

*McInnis.* See McGinnis.

**McIntosh**; mount, east of Atlin lake, Cassiar district, B.C.

**McIntosh**; village, Leeds county, Ont. (Not MacIntosh Mills.)

**McIntyre**; bay, south shore of lac Seul, Kenora district, Ont.

**McIntyre**; bay, south shore of lake Nipigon, Thunder Bay district, Ont.

**Mackay**; lake, Gloucester township, Carleton county, Ont. (Not Hemlock.)

**McKay**; H. B. Co. post, also settlement on Athabaska R., Alta. (Not Fort McKay.)

**McKay**; lake, south of Nanaimo river, Vancouver island, B.C.

**McKay**; mount, S.W. of Fort William, Thunder Bay district, Ont. (Not McKay's.)

**McKay**; reach, between Princess Royal and Gribbell islands, Coast district, B.C.

**McKay**; river, flowing northeasterly into Athabaska R. at McKay, Alta. (Not Red.)

**McKay**; rock, S.W. from Pulpwood point, Cockburn I., Manitoulin district, Ont.

**McKee**; creek, north of O'Donnel river, Cassiar district, B.C.

**McKellar**; channel, Kaministikwia river, Thunder Bay district, Ont. (Not McKellar river.)

**McKellar**; island, south of Pie island, Thunder Bay district, Ont.

**McKellar**; point, southwest of Victoria island, Thunder Bay district, Ont.

**McKenzie**; creek, flowing into Grand river, Brant and Haldimand counties, Ont. (Not Mackenzie.)

**McKenzie**; lake, Nightingale township, Haliburton county, Ont. (Not McKenzie's.)

**Mackenzie**; lake, S. of N. T. Ry., N.W. of L. Nipigon, Thunder Bay district, Ont.

**Mackenzie**; mount, southeast of Revelstoke, Kootenay district, B.C. (Not McKenzie.)

**Mackey**; point, Sheen township, Pontiac county, Que. (Not Mackay.)

**McKian**; creek, flowing southeasterly into Cooper creek, Kootenay district, B.C. (Not North Fork of Cooper creek.)

**McKim**; bay, west shore of South bay, Manitoulin island, Ont. (Not McKimm.)

*McLaren.* See McLaurin.

*McLaughlin.* See McLoughlin.

**McLaurin**; bay, east of East Templeton, Ottawa county, Que. (Not McLaren.)

**McLaurin**; lake, northwest of lake Nipigon, Thunder Bay district, Ont.

**McLay**; mount, east of Surprise lake, Cassiar district, B.C.

**McLean**; cañon, below the Grand falls of Hamilton river, Ashuanipi and New Quebec. (Not Bowdoin.) Named after John McLean, an officer of the H. B. Co. who discovered the falls and cañon in 1829.

**McLean**; mountain, north of mouth of Cayoosh creek, Lillooet district, B.C.

**McLean**; rock in Fitzwilliam channel, Manitoulin district, Ont.

*McLean.* See McLelan.

**McLelan**; strait, northeast shore of Ungava bay, New Quebec. (Not McLean.)

**McLennan**; lake, Haycock township, Kenora district, Ont.

**Macleod**; lake, Tp 51, R. 16, W. 3 M., Saskatchewan.

**Macleod**; town and railway station, southern Alberta. (Not Fort Macleod.)

**McLeod**; mount, west of Dease lake, Cassiar district, B.C.

**McLeod**; river, tributary to Athabaska river, central Alberta.

**McLoughlin**; bay, Lama passage, Coast district; also point in Victoria harbour; B.C. (Not M'Laughlin, Maclaughlin nor McLaughlin.)

**McMahon**; island, off the southeast side of Grenadier island, St. Lawrence river, Leeds county, Ont. (Not Shantee nor Shanty.)

**McMaster**; lake, Jones township, Renfrew county, Ont. (Not McMaster's.)

**McMaster**; mount, east of O'Donnel river, Cassiar district, B.C.

**MacMillan**; railway station, Kenora district, Ont.

**Macmillan**; range of mountains, and river tributary to Pelly river, Yukon.

*McMillan.* See Balache.

*McMullen.* See Carnarvon.

**McMurray**; H. B. Co. post, also settlement on Athabaska river, northeastern Alberta. (Not Fort McMurray.)

**McNab**; point, south of Chantry island, Bruce county, Ont.

**McNair**; island, St. Lawrence river, below Brockville, Leeds county, Ont.

**McNeil**; mount, betweeen Watson and Wheaton rivers, southern Yukon.

**McNevin**; lake, Murchison township, Nipissing district, Ont. (Not McNevin's.)

**McNicoll**; mount, southwest of Sixmile Creek station, Kootenay district, B.C.

**McNutt**; island, Shelburne harbour, Shelburne county, N.S. (Not McNutt's.)

*Macoming.* See Chiblow.

*Macoostigan.* See Makustigan.

**Macoun**; mount, northwest of mount Fox, Selkirk mountains, Kootenay district, B.C.

**McPhee**; bay, northern shore of lake Simcoe, Simcoe county, Ont.

**McPherson**; lake, north of Frances lake, Yukon.

**Macpherson**; mount, southwest of Revelstoke, Kootenay district, B.C.

**Macpherson**; point, northeast of Douglas point, Bruce Co., Ont. (Not McPherson.)

*Macquereau.* See Maquereau.

**McQuesten**; river, tributary to Stewart river, Yukon. (Not McQuestion.)

**McRae**; point, south of Douglas point, Bruce county, Ont.

**McReynolds**; hamlet, Grenville county, Ont. (Not McReynold's Corners.)

*McReynold's Corners.* See McReynolds.

**Mad**; reef, between Greenough point and Lyal island, Bruce county, Ont.

**Madawaska**; post office, Nipissing district, Ont.

**Madawaska**; river, tributary to Ottawa river, Renfrew county, Ont.

*Madendanada.* See Tendinenda.

**Madge**; lake, in Tps. 30 and 31, R. 30, W. P. M., Sask. (Not Clear Water.)

*Maduxnakeag.* See Meduxnekeag.

**Maganasibi**; river, tributary to Ottawa river, Timiskaming county, Que. (Not Maganacipi nor Maganasipi.)

**Maganatawan**; hamlet and river, Parry Sound district, Ont. (Not Magnetawan nor Maganetawan.)

**Maggie**; lake, Finlayson township, Nipissing district, Ont. (Not Maggie's.)

**Magnet**; channel, island and point, at the entrance to Black bay, Thunder Bay district, Ont.

*Magnetawan.* See Maganatawan.

**Magnetic**; island and reef, southeastern side of Cockburn I., Manitoulin district, Ont.

**Magnetic**; lake, W. of Gunflint L., international boundary, Thunder Bay district, Ont.

**Magog**; lake, and river tributary to St. Francis river, Sherbrooke and Stanstead counties, Que. (Not Little Magog lake.)

**Magog**; lake, in Mack township, Algoma district, Ont.

*Maguacha.* See Maguasha.

**Maguasha**; point and village, Nouvelle township, Bonaventure county, Que. (Not Goacha, Maguacha, Migaocha nor Miguasha.)

**Maguire**; mount, east of Sooke inlet, Vancouver island, B.C. (Not McGuire.)

**Magusi**; river, flowing northeasterly into Duparquet lake, Timiskaming, Ontario and Quebec. (Not Agotawekami, Asipimocasi nor Isabemagussi.)

*Mahmee.* See Mami.

*Mahogany.* See Manawagonish.

**Maiden**; island, east of Michael point, Manitoulin island, Manitoulin district, Ont.

**Maiden**; island, south shore Hudson strait, N.W.T. (Not Maiden Paps.)

**Maikasagi**; lake and river, emptying into Gull lake an expansion of Waswanipi river, Abitibi territory, Que. (Not Maikasksagi river nor Middle Gull lake.) Previous decision revised.

**Mailloux**; river, flowing into the St. Lawrence, at Murray Bay, Charlevoix Co., Que.

**Main**; channel, between Cove island and Bad Neighbour rock, entrance to Georgian bay, Bruce county, Ont.

**Mainadieu**; bay, lightstation, passage and village, Cape Breton county, N.S. (Not Main à Dieu, Main-à-dieu nor Menadou.)

**Maisonnette**; point and village, at north entrance to Caraquet harbour, Gloucester county, N.B. (Not Caraquet, Mezonet, Mizonette, nor Mizzenette.)

**Maitland**; island, Douglas channel, north of Hawkesbury island, Coast district, B.C.

**Maitland**; river, emptying into lake Huron at Goderich, Huron county, Ont.

*Maitland.* See Port Maitland.

**Makamik**; lake, Royal-Roussillon township, Timiskaming Co., Que. (Not Mekamic.)

**Makokibatan**; lake, Albany river, Patricia and Thunder Bay districts, Ont.

**Makustigan**; lake, S. of Wetetnagami L., Pontiac county, Que. (Not Macoostigan.)

**Makwa**; lake and river, trib. to Beaver R., from the southwest, Sask. (Not Loon.)

**Malahat**; ridge, west of Saanich inlet, Vancouver island, B.C. (Not Beddingfield.)

*Malaspina's.* See Galiano.

**Malbaie (rivière)**; river, tributary to the St. Lawrence, Charlevoix county, Que. (Not Malbay.) English usage: Murray river, which see.

**Malbaie**; See also Murray Bay.

**Malcolm**; reef, between Boyer reef and Port Elgin, Bruce county, Ont.

**Malcolm**; river, flowing northeasterly into the Arctic ocean, international boundary, Alaska and Yukon.

**Mâle (lac du)**; lake, at headwaters of St. Maurice river, Champlain county, Que.

**Maligne**; lake and river, emptying into the Athabaska near Jasper, also mountain east of the lake, Rocky mountains, Alberta.

**Mallon**; lake, in Rattray township, Timiskaming district, Ont.

**Maloney**; mount, northwest of Aishihik lake, Yukon.

**Malpeque**; bay, Prince county, P. E. I. (Not Richmond.)

**Mamakwash**; lake, at headwaters of Berens R., Patricia district, Ont. (Not Fairy.)

**Mameigwess**; lake, north of Attawapiskat lake, Patricia district, Ont.

**Mami**; creek, tributary to Belly river, southern Alberta. (Not Buffalo, Fish, nor Mahmee.)

**Mamozekel**; river, tributary to Tobique river, Northumberland and Victoria counties, N.B. (Not Mamoxekel nor Momozekel.)

**Manasan**; river, tributary to Burntwood river, Manitoba. (Not Munosahn.)

**Manawagonish**; island, in St. John harbour, St. John county, N.B. (Not Mahogany, Manawoganish nor Meogenes.)

**Manawan**; lake, on Churchill river, below Reindeer river, central Saskatchewan.

**Mance**; lake, La Sarre township, Timiskaming county, Que. (Not Mud.)

**Mandamin**; post village and railway station, Lambton Co., Ont. (Not Mandaumin.)

**Mang**; lake, west of Kawawia lake, Kenora district, Ont. (Not Loon.)

**Manganese**; mountain, east of Ice river, Rocky mountains, Kootenay district, B.C.

*Manicouagan.* See Manikuagan.

*Manicuagan.* See Manikuagan.

**Manigotagan**; lake and river, east of lake Winnipeg, Man. (Not Bad Throat river, Muskrat lake nor Rat Portage lake.)

**Manikuagan**; point and river, Saguenay Co., Que. (Not Manicouagan nor Manicuagan.)

**Manito**; lake, south of Battle river, Saskatchewan.

**Manitoba**; lake Manitoba.

**Manitoba**; ledge, off W. side of Yeo I., entrance to Georgian bay, Manitoulin dist., Ont.

**Manitoba**; reef, north of Great Duck island, Manitoulin district, Ont.

**Manitou**; creek, flowing into Michael bay, Manitoulin island, Manitoulin district, Ont.

**Manitou**; lake, northwest of lake Nipigon, Thunder Bay district, Ont.

**Manitou**; rapid, Rainy river, international boundary, Rainy River district, Ont.

*Manitou.* See Silver.

**Manitoulin**; island, L. Huron, Manitoulin district, Ont. (Not Grand Manitoulin.)

*Manitoulin gulf.* See South bay.

**Manitounuk**; sound, north of Great Whale river, New Quebec. (Not Manitounuck.)

**Manitowaning**; bay and village, Manitoulin island, Ont. (Not Manitouaning.)

**Manitumeig**; lake, west of Anzhekumming lake, Kenora district, Ont.

**Manitush**; lake, southwest of Attawapiskat lake, Patricia district, Ont.

**Mann**; island, east of Bigsby island, at entrance to Key harbour, Georgian bay, Parry Sound district, Ont.

**Mann**; island, in upper part of lake Timiskaming, Que.

**Manomin**; lake, west of Winnange lake, Kenora district, Ont. (Not Unaminnikan.)

*Manquart.* See Monquart.

**Manseau**; parish, Nicolet county, Que.

**Mansel**; island, Hudson bay, N.W.T. (Not Mansfield.)

**Mansfield**; creek, tributary to Tatshenshini river, Cassiar district, B.C. (Not Bear.)

*Mansfield.* See Mansel.

**Mantagao**; river, flowing northerly into Sturgeon bay, lake Winnipeg, Manitoba.

**Manuan**; lake, and river tributary to the upper St. Maurice, Champlain county, Que. (Not Manouan.)

*Manuminan.* See Paint.

**Many Island**; lake, east of Medicine Hat, Alberta and Saskatchewan.

**Maple**; bay and mountain, W. Sansum narrows, Stuart channel, Vancouver I., B.C.

**Maple**; creek flowing into Bigstick lake, also Maple Creek town, southwestern Sask.

**Maple**; island, St. Lawrence R, Soulanges county, Que. (Not D'Alogmy nor Thorn.)

**Maple**; point, at the northeast end of Gil island, Coast district, B.C.

*Maple.* See Goosehunting.

**Maplegrove**; hamlet, Middlesex county, Ont. (Not Maple Grove.)

**Maquereau**; point, Gaspe county, Que. (Not Macquereau.)

**Mara**; lake, south of Shuswap lake, Kamloops district, B.C. (Not Mara arm of Shuswap lake.)

**Marble**; cañon, a very narrow deep pass through the range of mountains between Bonaparte and Fraser rivers, Lillooet district, B.C.

**Marble Dome**; mountain, S. of Gladys lake, Cassiar dist., B.C. (Not Brown Dome.)

**Margaree**; town, Inverness county, N.S. (Not Margaree Harbour.)

**Margaret**; lake, northeast of Turquoise lake, Alberta.

**Margaret**; lake, at headwaters of Wenasaga river, Patricia district, Ont. (Not Kakinookama.)

**Margaretville**; village, on the bay of Fundy, Annapolis county, N.S. (Not Margaretsville.)

**Marguerite**; bay, point and river, north shore of lower St. Lawrence, Saguenay county, Que. (Not Ste. Marguerite.)

**Maria**; lake, northwest of Tuya lake, Cassiar district, B.C.

**Maria**; lake, Purdom township, Thunder Bay district, Ont.

**Marieville**; railway station and village, Rouville county, Que.

*Marieville.* See Huron.

**Marina**; island, S.W. of Cortes I., Sutil channel, Coast district, B.C. (Not Mary.)

**Marion**; lake, west of Glacier station, Kootenay district, B.C.

**Marion**; mount, northwest of Cooper mountain, Kootenay district, B.C.

**Marion**; point, near Dorval, Jacques Cartier county, Que. (Not Macdougall's.)

*Marion.* See Allan.

**Marjorie**; island, westward of Sandys point, St. Peter inlet, Richmond county, N.S. (Not Gooseberry.)

**Mark**; creek, tributary to St. Mary river, Kootenay district, B.C.

**Mark**; lake, northeast of Silver lake, Kenora district, Ont.

**Markham**; bay, northeast shore of Hudson strait, N.W.T.

*Marksville.* See Hilton.

**Marmen**; rock, east of Brandypot channel, St. Lawrence R., Temiscouata Co., Que.

**Marmot**; mountain, north of Observation peak, Rocky mountains, Alberta.

**Marpole**; mount, also lakes, at headwaters of Yoho river, Kootenay district, B.C.

**Marsh**; lake, near Bennett and Tagish lakes, southern Yukon.

*Marshall Cove.* See Port Lorne.

**Marshall**; creek and lake, emptying into Bridge river, Lillooet district, B.C. (Not Alexander.)

**Marshall**; lake, northeast of lake Nipigon, Thunder Bay district, Ont.

**Marshall**; ridge, between Marshall and Tyaughton creeks, Lillooet district, B.C. (Not Alexander.)

**Mars Hill**; post settlement, Carleton county, N.B. (Not Mar's Hill.)

**Martel**; hamlet, Russell county, Ont. (Not Martel Corners.)

*Martel Corners.* See Martel.

**Marten**; creek, tributary to Michel creek, Kootenay district, B.C. (Not Martin.)

**Marten**; river, tributary to Rupert river, Mistassini territory, Que.

**Marten Drinking**; river, emptying into Attawapiskat lake, Patricia district, Ont.

**Martimoki**; lake, Saguenay county, Que. (Not Martimokinipau.)

**Martin**; head, St. Martins parish, St. John county, N.B. (Not Martin's nor St. Martin.)

**Martin.** lake, northeast of Lost lake, Kenora district, Ont.

**Martin**; lake, southeast of Humboldt bay, L. Nipigon, Thunder Bay district, Ont.

**Martin**; mountain, east of Lesser Slave lake, Alberta.

*Martin.* See Martre.

**Martineau**; bay, Lorrain township, Timiskaming district, Ont.

**Martineau**; river, flowing southwesterly into Cold lake, central Alberta.

**Martini**; island, west of Moore point, southern coast of Digby I., Coast district, B.C.

**Martins**; valley, east of Chancellor peak, Rocky mountains, Kootenay district, B.C.

**Martre** (rivière à la); river, Christie township, Gaspe county, Que. (Not Martin river nor Rivière à la Marte.) See also Rivière-à-la-Martre.

**Mary**; creek, tributary to Teslin river, near M'Clintock peak, Yukon.

**Mary**; point, Boxer reach, Coast district, B.C.

**Mary**; shoal, south of Great Duck island, Manitoulin district, Ont.

*Mary.* See Marina.

*Marysville.* See Wolfe Island.

**Mary Vaux**; mount, south of southeast end of Maligne lake, Rocky mountains, western Alberta.

**Mascabin**; point, at the north entrance to Passamaquoddy bay, Charlotte county, N.B. (Not Mascarin.)

**Mascareen**; peninsula and village, Charlotte county, N.B. (Not Mascarene nor Mascarren.)

*Mascarin.* See Mascabin.

*Mashamengoose.* See Mitchinamekus.

**Masinabik**; lake, S.E. of L. Nipigon, Thunder Bay dist., Ont. (Not Masinabikaigan.)

**Maskeig**; lake, St. Maurice county, Que.

**Maskwa**; hill, on Battle river, west of Cutknife creek, central Saskatchewan.

**Maskwa**; river, tributary to Winnipeg river, Man. (Not Bear.)

*Maspeck.* See Mispeck.

**Massasauga**; point, west of Horse point, Ameliasburg Tp., Prince Edward Co., Ont.

**Masstown**; lightstation, and settlement, Cobequid bay, Colchester county, N.S. (Not Debert and Mass Town.)

*Matabechawan.* See Matabitchuan.

**Matabitchuan**; river, flowing into lake Timiskaming, below the mouth of Montreal river, Timiskaming district, Ont. (Not Matabechawan nor Matabitchouan.)

*Matamik.* See Lois.

**Matapedia**; lake, river and village, Matane and Bonaventure Cos., Que. (Not Metapedia.)

**Matashi**; river, headwaters of Gatineau river, Berthier county, Que.

*Matawa.* See Mattawin.

*Matawa.* See Shamattawa.

*Matawin.* See Mattawin.

**Matchimanito**; lake, southwest of Millie lake, Pontiac county, Que.

**Matheson**; island, W. of N. entrance to narrows of lake Winnipeg, Man. (Not Snake.)

**Matheson**; mount, also lake, north of Becher bay, Vancouver island, B.C.

**Matheson**; mount, on east side of Bennett lake, Yukon.

**Matilda**; lake, Redditt township, Kenora district, Ont.

*Matinatinda.* See Tendinenda.

**Matsatu**; river, tributary to Nahlin river, Cassiar district, B.C.

**Mattagami**; lake, Abitibi territory, Que.

**Mattagami**; river, tributary to Moose river, Timiskaming district, Ont. (Not South Branch of Moose river.)

*Mattagami.* See Allard.

*Mattawagosik.* See Dasserat.

**Mattawin**; river, tributary to St. Maurice river, Berthier, Champlain, Joliette, Maskinonge and St. Maurice counties, Que. (Not Matawa nor Matawin.)

**Matthew**; creek, tributary to St. Mary river, Kootenay district, B.C.

**Matthews**; point, Active pass, strait of Georgia, New Westminster district, B.C.

**Mattice**; lake, south of N.T. Ry., northwest of L. Nipigon, Thunder Bay district, Ont.

**Mauger**; beach, at entrance to Halifax harbour, Halifax county, N.S. (Not Meagher.)

**Maunoir**; butte, near confluence of Lewes and Teslin rivers, Yukon.

**Maurelle**; island, between "Hole in the wall" and Surge narrows, Coast district, B.C. The eastern portion of what was formerly Valdes island.

**Maus**; creek, E. of Kootenay R., south of Steele, Kootenay district, B.C. (Not Mouse.)

**Maxwell**; mount, Saltspring island, S.E. coast of Vancouver I., B.C. (Not Baynes.)

**Maybank**; hamlet, Huntingdon county, Que. (Not May Bank.)

*Maybee.* See Mabee.

**Mayes**; point, at N. end of Read I., Sutil channel, Coast district, B.C. (Not Mayor.)

**Mayflower**; island, at entrance to Thomas bay, Manitoulin island, Ont.

**Maynard**; lake, English river, Kenora district, Ont. (Not Maynard's.)

**Mayne**; island and post village, strait of Georgia, New Westminster district, B.C.

**Mayo**; brook and lake, tributary to Stewart river, Yukon.

*Mayor.* See Mayes.

*Mazokama.* See Kama.

**Meacham**; creek, St. Mary river, Kootenay district, B.C. (Not Caribou nor Whitefish.)

**Meadow**; creek, branch of Sulphur creek, Indian river, Yukon.

**Meadow**; creek, tributary to Lardeau river, above Cooper creek, Kootenay district, B.C.

**Meadow**; creek and lake, tributary to Beaver river, central Saskatchewan.

**Meadow**; mountain, northwest of Kootenay lake, Kootenay district, B.C.

*Meadow.* See Hawkins.

*Meadow.* See Linklater.

*Meagher.* See Mauger.

**Meander**; brook, south of Eagle lake, Kenora district, Ont.

*Mecatina.* See Mekattina.

**Medicine**; river, tributary to Red Deer river, southern Alberta.

**Medicine-lodge**; hills, in Tp. 40, R. 2, W. 3 M., southern Alta. (Not Medicine Lodge.)

*Medicine Lodge.* See Lodge.

**Medicine-stone**; lake, south of Red lake, Patricia district, Ont. (Not Medicine Stone.)

**Meduxnekeag**; river, tributary to St. John river, Carleton county, N.B. (Not Maduxnukeag nor Meduxnakeag.)

**Medway**; river, trib. to N. branch of Thames R., Middlesex Co., Ont. (Not Arva creek.)

**Medway**; river, and seaport town, Queens county, N.S. (Not Port Medway nor Port Metway.)

**Meehin**; brook, flowing into Minas channel, Kings county, N.S. (Not Meehins.)

**Meeting**; lake, in the Thickwood hills, central Saskatchewan.

**Megantic**; county, lake and village, Que. (Not Lake Megantic village.)

**Meggisi**; brook, tributary to upper Winisk river, below Tabasokwia river, Patricia district, Ont.

**Meggisi**; lake, east of Manitou lake, Kenora district, Ont. (Not Small Trout.)

*Megiskun.* See Migiskan.

*Mehollan.* See Mulholland.

*Meholland.* See Mulholland.

**Meig**; hamlet, Missisquoi county, Que. (Not Meig's Corners.)

*Meig's Corners.* See Meig.

**Meisner**; point, E. side of Mahone bay, Lunenburg Co., N.S. (Not Meisener nor Misener.)

*Mejomanguse.* See Mitchinamekus.

*Mekamic.* See Makamik.

**Mekattina**; cape, islands and river, Saguenay county, Que. (Not Mecatina, nor Little Mecattina river.)

**Mekinac**; lake, river, and township, Champlain county, Que. (Not Mekinak.)

*Mekiscan.* See Migiskan.

**Meldrum**; point, northwestern end of Manitoulin island, Manitoulin district, Ont. (Not Mildram nor Mildrum.)

**Melfort**; creek, railway station and settlement, central Sask. (Not Stony creek.)

**Melon**; lake, between Knife and Carp lakes, Int. boundary, Rainy River district, Ont.

**Melville**; arm, on northerly side of Prince Rupert harbour, Coast district, B.C.

**Melville**; island, Admiralty group, St. Lawrence river, Leeds county, Ont. (Not Hay.)

**Melville**; lake, expansion of Hamilton inlet, Ashuanipi territory, Que. (Not Groswater bay.)

**Melville**; point, south of Srigley bay, Manitoulin island, Ont.

**Melville**; shoal, east of northeast end of Amherst island, Frontenac county, Ont. (Not Seven Acre.)

*Menadou.* See Mainadieu.

*Menan.* See Grand Manan.

**Mendenhall**; river, tributary to Takhini river, Yukon.

**Menesatung**; park, north of Goderich, Huron county, Ont.

**Menikwesi**; lake, west of Kawawia lake, Kenora district, Ont.

*Menjobaguse.* See Mitchinamekus.

**Mennin**; lake, S.E. of Dinorwic L., Kenora district, Ont. (Not Blueberry nor Shallow.)

*Meogenes.* See Manawagonish.

**Merigomish**; island and village, Pictou Co., N.S. (Not Big I. nor Merigomishe village)

*Merion.* See Mirond.

**Merlin**; lake, north of mount Richardson, Rocky mountains, Alberta.

**Mermaid**; island, Admiralty group, St. Lawrence R., Leeds county, Ont. (Not Pine.)

**Merriam**; bay, west of Bayley bay, Basswood lake, international boundary, Rainy River district, Ont.

*Merrill.* See Fréchette.

*Mescoh.* See Misko.

**Mesilinka**; river, flowing from Aiken lake to Omineca river, Cassiar district, B.C. (Not Mesalinca nor Stranger.)

**Meskwatessi**; lake, east of Atikwa lake, Kenora district, Ont.

**Mestowana**; lake, northwest of Lost lake, Kenora district, Ont.

**Metabetchouan**; post office, river and township, Chicoutimi county, Que. (Not Metabechouan.)

*Metaghan.* See Meteghan.

*Metapedia.* See Matapedia.

**Metaskuak**; lake and river, tributary to Metabetchouan river, Quebec and Montmorency counties, Que. (Not Metascouac nor Metasqueag.)

*Metchiskan.* See Migiskan.

**Metchosin**; mountain, west of Parry bay, Vancouver I., B.C. (Not Metchosin hill.)

**Meteghan**; river and village, Digby county, N.S. (Not Metaghan.)

**Meteghan Station**; post office, Digby county, N.S. (Not Metaghan.)

**Metford**; island, midway between Lima and Miller points, southern coast of Digby island, Coast district, B.C.

**Methuen**; reef, south shore of Manitoulin island, Manitoulin district, Ont.

**Methy**; lake, south of File lake, Manitoba. (Not Long.)

**Methye**; lake, portage and river, northern Sask. (Not La Loche nor Methy.)

**Metis**; lake, point, river and village, Matane Co., Que. (Not Mitis nor Great Metis.)

*Metiscan.* See Migiskan.

**Metlakatla**; bay and village, Chatham sound, Coast district, B.C. (Not Melta Catla, Metla Catlah, Metlah Catlah, Metla-kathla, Methlakahtla nor Metla-Katla.)

**Meule** (pointe à la); point with 2 range lights thereon, west shore of Richelieu river St. Johns county, Que. (Not North of Halfway nor Pointe à Mule.)

*Mezonet.* See Maisonnette.

**Michael**; bay and point, south shore of Manitoulin island, Manitoulin district, Ont.

**Michael**; lake, northwest of Kulleet bay, Vancouver island, B.C.

**Michael**; peak, President range, Rocky Mts., Kootenay district, B.C. (Not Michael's.)

*Michagama.* See Kitchigama.

**Michaud**; creek, tributary to Klondike river, Yukon.

**Michaud**; creek, west of Lower Arrow lake, Kootenay district, B.C.

**Michel**; creek, tributary to Elk river, Kootenay district, B.C.

*Michepasque.* See Mispek.

**Michie**; mount, east of lake Marsh, Yukon.

**Michikamog**; lake, northeast of Attawapiskat lake, Patricia district, Ont.

**Michikenis**; river, east of Wunnummin lake, upper waters of Winisk river, Patricia district, Ont.

**Michikenopik**; brook, tributary to Pizustigwan river, upper Winisk river, Patricia district, Ont.

**Michipicoten**; harbour, river and village, Algoma district, Ont. (Not Michipicoton.)

**Michipicoten**; island, L. Superior, Thunder Bay district, Ont.

**Middle**; creek, tributary to Tahltan river, Cassiar district, B.C.

**Middle**; mountain, near lower Stikine R., S. of Porcupine creek, Cassiar dist., B.C.

**Middle**; river, Pictou county, N.S. (Not Middle river of Pictou.)

*Middle Branch of Highwood river.* See Pekisko creek.

*Middle Branch of West river.* See Dalesville river.

*Middle Caledonia.* See Caledonia.

**Middle Duck**; island, south of Inner Duck island, Manitoulin district, Ont.

*Middle Fork of Findlay* (creek). See Doctor.

*Middle Fork.* (Spillimacheen river.) See Bobbie Burns creek.

*Middle Fork of Gold creek.* See Caven creek.

*Middle Gull* (lake). See Maikasagi.

**Middlebrun**; bay, channel and island, S. entrance to Black B., Thunder Bay dist., Ont.

**Middle Savage**; islands, northwest of Pritzler harbour, Hudson strait, N.W.T. (Not islands of God's Mercie (eastern).

*Middleport.* See Tuscarora.

**Middleton**; island, at the mouth of Broadback river, Abitibi territory, Que.

**Middleton**; mount, southeast of lake Evans, Abitibi territory, Que.

*Middletons.* See Reesor.

**Midjik**; point, on east side of Passamaquoddy bay, Charlotte county, N.B. (Not Midgic, Midjic nor Mijic bluff.)

**Midnight**; lake, Tp. 52, R. 16, W. 3 M., Saskatchewan.

**Midway**; mining town and railway station, Similkameen district, B.C.

**Migiskan**; river, flowing westerly from the height of land near sources of St. Maurice river into Shabogama lake, Pontiac county, Que. (Not Megiskun, Mekiscan, Metchiskan nor Metiscan.)

*Migoacha.* See Maguasha.

*Miguasha.* See Maguasha.

*Mijic.* See Midjik.

**Mikkwa**; river, flowing into Peace river and east of Wabiskaw river, Alberta. (Not Red.)

**Mikwasach**; lake, west of Opemiska lake, Abitibi territory, Que. (Not Wikwasash.)

*Mildram.* See Meldrum.

*Mildrum.* See Meldrum.

**Mile**; island, Brock group, St. Lawrence R., Leeds county, Ont. (Not Huckleberry.)

*Mile.* See Victoria.

**Miles**; cañon, on Lewes river, above Whitehorse rapid, Yukon.

**Miles**; point, Gabriola island, strait of Georgia, B.C. (Not Schooner.)

**Milk**; river, rises in Montana, and crossing the international boundary flows easterly through Alberta, thence southwesterly, recrossing the boundary, into Montana.

*Mill.* See Galt.

**Millar**; settlement, Grenville county, Ont. (Not Millar's Corners.)

*Millar's.* See Riall.

*Millar's Corners.* See Millar.

**Miller**; creek, tributary to Sixtymile river, Yukon.

**Miller**; lake, southwest of Williams bay, L. Seul, Kenora district, Ont.

**Miller**; mount, west of Lewes river, Yukon.

**Miller**; point, western entrance point of Robinson cove, Big island, bay of Quinte, Prince Edward county, Ont. (Not Miller's.)

**Miller**; point, southeast coast of Digby island, Coast district, B.C.

**Mille-Roches**; village, Stormont county, Ont.

**Mille-Vaches**; bay, point and river, Saguenay Co., Que. (Not Saut de Mouton river.)

**Millie**; lake, northeast of Matchimanito lake. Pontiac county, Que.

**Milliken**; post village and railway station, Markham township, York county, Ont. (Not Millikens.)

**Millstream**; river, flowing easterly into Nipisiguit bay, Gloucester county, N.B. (Not Little Nipisiguit nor Nipisiguit Millstream.)

**Milton**; bank, southeast of Wells shoal, Bruce county, Ont.

**Milton**; hamlet, Shefford county, Que. (Not Milton East.)

**Milton**; island, N. of Wolfe I., St. Lawrence R., Frontenac Co., Ont. (Not Amazon.)

**Milton**; mount, east of Lewes river, Yukon.

**Milton**; point, between Lonely and Lougheed bays, Manitoulin island, Ont.

**Milton**; town and railway station, Halton county, Ont. (Not Milton West.)

*Milton East.* See Milton.

*Milton West.* See Milton.

**Miltonbrae**; hamlet, Gloucester county, N.B. (Not Milton Brae.)

**Miminegash**; river and village, Prince county, Prince Edward Island. (Not Big nor North Miminigash nor Minimegash.)

**Miminiska**; lake, Albany river, Patricia and Thunder Bay districts, Ont.

**Mimominatik**; brook, emptying into Kapkichi lake, upper Winisk river, Patricia district, Ont.

**Minago**; river, emptying into Cross lake, Manitoba. (Not Pine.)

**Minaret**; col., and peak, Sir Sandford range, Selkirk Mts., Kootenay district, B.C.

**Minas**; basin, east arm of the bay of Fundy, Colchester, Cumberland, Hants, and Kings counties, N.S. (Not Basin of Mines nor Mines Basin.)

**Mindemoya**; river, emptying into Providence bay, Manitoulin I., Manitoulin dist., Ont.

**Mineral**; creek and town, north of Caribou creek, Kootenay district, B.C.

*Mineronte.* See Mirond.

**Miners**; range of mountains, near lake Laberge, Yukon.

*Mines basin.* See Minas basin.

**Minette**; bay, Kitimat arm, Coast district, B.C.

*Minimegash.* See Miminegash.

*Minimegash.* See Roseville.

**Ministik**; lake, in Tp. 50, R. 21, W. 4th M., Alberta.

**Ministikwan**; lake, west of Makwa lake, central Sask. (Not Little Island lake.)

**Minitonas**; creek, hill, post office and railway station, western Manitoba.

**Mink**; reef, Manitoulin island, northwest of Steevens island, Manitoulin district, Ont

*Mink.* See Ninette.

**Minnaweiskag**; lake, N. of Manitou L., Kenora dist., Ont. (Not Kaminnaweiskagwok.)

**Minnedosa**; river, tributary to Assiniboine river, western Manitoba (Not Little Saskatchewan nor Rapid.)

**Minnehaha**; lake, north of Peak lake, Kenora district, Ont. (Not Kiskopkechewans.)

**Minnesabik**; lake, south of Separation lake, Kenora district, Ont.

**Minnewakan**; post village, Posen municipality, Manitoba.

**Minnewanka**; lake, in the Rocky Mountains park, Alberta. (Not Devil's Head.)

**Minnie Bell**; creek, tributary to Flat creek, Klondike river, Yukon.

**Minnikau**; river, east of Minnitaki lake, Kenora district, Ont.

**Minnitaki**; lake and railway station, Kenora district, Ont. (Not Minnietakie.)

**Mint**; creek, branch of Hunker creek, Klondike river, Yukon.

**Minto**; mount, west of Atlin lake, near north end, Cassiar district, B.C.

**Miquelon**; lake, in Tp. 49, Rs. 20 and 21, W. 4th M., Alberta.

**Miramichi**; bay and river, Northumberland county, N.B. (Not Mirimichi.)

*Mire.* See Shunda.

*Mirimichi.* See Miramichi.

**Mirond**; lake, headwaters of Sturgeon-weir river, eastern Saskatchewan. (Not Heron, Merion, Mineronte, nor Stone.)

**Mirror**; lake, west of lake Louise, Alberta.

**Misamikwash**; lake, west of Wunnummin lake, upper waters of Winisk river, Patricia district, Ont.

**Miscou**; island, harbour and point, Gloucester Co., N.B. (Not Miscow nor N. Mya.)

*Misener.* See Meisner.

**Misery**; bay and point, south shore of Manitoulin island, Manitoulin district, Ont.

**Mishagomish**; lake, east of lake Evans, Abitibi territory, Que.

**Mishomis**; lake, southwest of Grand lake Victoria, Timiskaming county, Que.

*Misinabi.* See Missinaibi.

**Miskatla**; Indian village, Douglas channel, opposite Maitland island, Coast district, B.C. (Not Mis-ka-tla.)

**Miskittenau**; lake, at headwaters of Rupert river, Mistassini territory, Que.

**Misko**; creek, tributary to Ottertail R., Rocky Mts., Kootenay dist., B.C. (Not Mescoh.)

**Miskwabi**; lake, Dudley township, Haliburton county, Ont. (Not Mis-quah-be- nish.)

*Mispec.* See Mispek.

*Mispeck.* See Mispek.

**Mispek**; post settlement and river, St. John county, N.B. (Not Maspeck, Michepasque, Mispec, Mispeck, Misshapec nor Mizpeck.) Jeffery's map of 1755 has 'Mispek.'

*Mis-quah-be-nish.* See Miskwabi.

**Missaguash**; river, emptying into Cumberland basin, Westmorland county, N.B. (Not Misseguash, Missiguash nor Missiquash.)

*Missanabie.* See Missinaibi.

**Missawawi**; lake, south of lac La Biche, central Alberta. (Not Big Egg.)

*Misseguash.* See Missaguash.

*Misshapec.* See Mispek.

*Missiguash.* See Missaguash.

**Missinaibi**; lake and railway station, Algoma district, also river flowing from the lake into Moose river, Algoma and Timiskaming districts, Ont. (Not Misinabi nor Missanabie.)

*Missinnippi.* See Churchill

**Mission**; bay, and channel (southern) of Kaministikwia river, Thunder Bay district, Ont. (Not Mission river.)

**Mission**; mountain, Tsimpsean peninsula, W. of Prince Rupert har., Coast dist., B.C.

**Mission**; pass, between Bridge river and Seton lake, Lillooet district, B.C.

**Missipisew**; river, tributary to Grass river, Manitoba.

*Missiquash.* See Missaguash.

**Mississagi**; bay, island, river and strait, at north end of lake Huron, Algoma and Manitoulin districts, Ont. (Not Mississauga.)

**Mississagua**; brook and lake, Peterborough county, Ont. (Not Gull lake.)

**Mist**: creek and mountain, Misty range, southern Alberta.

**Mista**; a peak of the Valkyr mountains, Kootenay district, B.C.

**Mistake**; mountain, northwest of L. Laberge, Yukon.

**Mistassibi**; river, tributary to Mistassini river, Lake St. John county, Que. (Not Muskosibi.) Reversal of previous decision.

**Mistassini**; lake, Mistassini territory, Que.

*Mistassinis.* See Albanel.

**Mistawak**; lake, west of Harricanaw river, Abitibi territory, Que. (Not Mistewak nor Mistowak.)

**Mistaya**; river, at headwaters of Saskatchewan river, Alta. (Not Little Fork of the Saskatchewan nor Bear creek.)

*Mistigouche.* See Mistikus.

*Mistigougèche.* See Mistikus.

**Mistikus**; lake, Rimouski county, Que. (Not Mistigouche nor Mistigougèche.)

*Mistowak.* See Mistawak.

**Misty**; range of mountains, northwest of Highwood range, southern Alberta.

**Mitchell**; bay and point, L. St. Clair, Kent county, Ont. (Not Mitchell's.)

**Mitchell**; range of mountains, east of Kootenay river, Kootenay district, B.C.

**Mitchell**; river, flowing southerly into Cross river, Kootenay district, B.C. (Not North Fork of Cross River.)

**Mitchell Bay**; village, Kent county, Ont. (Not Mitchell's Bay.)

**Mitchinamekus**; lake and river, headwaters of Lièvre river, Berthier, Champlain, Maskinonge, and St. Maurice counties, Que. (Not Mashamengoose, Mejomanguse, nor Menjobaguse.)

*Mitis.* See Metis.

**Mitishto**; river, tributary to Grass river, below Wekusko lake, Manitoba.

*Mizonette.* See Maisonnette.

*Mizpeck.* See Mispek.

*Mizzenette.* See Maisonnette.

**Mobbs**; creek, flowing northeasterly into Lardeau river, east of Gerrard, Kootenay district, B.C. (Not Canyon.)

**Moberly**; creek, west of Lower Arrow lake, Kootenay district, B.C.

**Moberly**; lake and river, tributary to Peace R., Peace River district, B.C. (Not Moberley.)

**Moberly**; mount, east of Athabaska river, 17 miles above mouth of Whirlpool river, western Alberta.

**Moberly**; peak and railway station, Rocky mountains, Kootenay district, B.C.

**Mohawk**; post settlement and railway station, Brant Co., Ont. (Not Mt. Pleasant.)

**Mohican**; mountain, west of Duncan river, Kootenay district, B.C.

**Moira**; river, emptying into the bay of Quinte, near Belleville, Hastings county, Ont.

**Moisie**; bay, point, river, rock and shoal, Saguenay Co., Que. (Not Moisi nor Moisic.)

**Mokowan**; butte, east of Belly river, southern Alberta. (Not Belly.)

**Mokwawastuk**; lake, at headwaters of Marten river, Mistassini territory, Que. (Not Mokwahwastuk.)

**Molar**; mountain, northeast of mount Hector, Rocky mountains, Alberta.

*Molesworth.* See Lois.

**Moloch**; mount, southeast of Mt. Holway, Selkirk Mts., Kootenay district, B.C.

**Molus**; river, tributary to Richibucto river, Kent county, N.B. (Not Moulie's.)

*Momozekel.* See Mamozekel.

**Monckland**; village and railway station, Stormont county, Ont. (Not Moncklands, Monklands nor Moncklands Station P.O.)

**Mondonak**; lake and river, upper waters of Manuan river, Champlain county, Que.

**Monell**; reef, at entrance to Wood bay, Manitoulin island, Manitoulin district, Ont.

**Money**; point, on the southern portion of Hawkesbury island, Coast district, B.C.

**Mongus**; lake, near Manitou lake, Kenora district, Ont.

**Monk**; lake, Cardiff township, Haliburton county, Ont.

*Monklands.* See Monckland.

**Monmouth**; lake, Monmouth township, Haliburton county, Ont.

**Monquart**; river, tributary to St. John river, Carleton county, N.B. (Not Manquart nor Munquart.)

**Monroe**; creek and lake, near Moyie lake, Kootenay district, B.C.

*Monroe.* See Munro.

**Monsomshi**; lake, on Severn river, Patricia district, Ont. (Not Mon-som-shi-pin-net.)

**Monson**; mount, west of Lewes river, Yukon.

**Montague**; lake, Skead township, Timiskaming district. Ont.

**Montague**; lake, Tp. 6, R. 29, W. 2 M., Saskatchewan.

**Montague**; village, Kings county, Prince Edward Island. (Not Montague Bridge.)

**Montana**; creek, tributary to Yukon river, above Dawson, Yukon.

**Monte**; creek, hills and lake, south of Ducks station, Kamloops district, B.C.

**Montebello**; railway station and village, Labelle county, Que. (Not Monte Bello.)

**Montée-du-Lac**; cove and landing, on the St. Lawrence, west of Cap Brûlé, also road leading from thence to St. Joachim lakes. Montmorency county, Que.

*Montée du Lac.* See Cap Brûlé.

*Montgomery.* See McCoy.

*Montgomery.* See Young.

**Mont-Laurier**; parish and railway station, Labelle county, Que. (Not Mont Laurier.)

**Montpellier**; parish and village, Labelle county, Que. (Not Montpelier.)

**Montreal**; channel, west of Edward island and south of entrance to Black bay, Thunder Bay district, Ont.

**Montreal**; lake and river, south of Churchill river, central Sask. (Not Rapid river.)

**Montreal**; river, flowing southeasterly into lake Timiskaming, Ont.

**Montrose**; cape, Markham bay, Hudson strait, N.W.T.

**Monts** (pointe des); point, Saguenay county, Que. See also Pointe-des-Monts.
**Monumental**; island, southeast of Clements Land, N.W.T.
**Moody**; point, Boxer reach, Coast district, B.C.
*Moonshine.* See Uphill.
**Moore**; lake, Lutterworth township, Haliburton county, Ont. (Not Moore's.)
**Moore**; point, southern coast of Digby island, Coast district, B.C.
**Moore**; village, Lambton county, Ont. (Not Mooretown.)
**Moore**; rock, Blunden harbour, Queen Charlotte sound, Coast district, B.C.
**Moose**; creek, tributary to Fortymile river, near international boundary, Yukon.
**Moose**; island, Fisher bay, lake Winnipeg, Manitoba.
**Moose**; lake, north of Cedar lake, Manitoba.
**Moose**; lake and portage, on international boundary, Thunder Bay district, Ont.
**Moose**; mountain, also Moose Mountain, creek, southeastern Sask.
*Moose.* See Bonald.
*Moose.* See Fawcett.
**Moosehide**; creek and mountains, near mouth of Klondike river, Yukon.
**Moosehorn**; bay and lakes, east shore of L. Manitoba, Man. (Not Moose Horn.)
**Moosehorn**; lake, west of Grand lake Victoria, Timiskaming county, Que.
**Moosejaw**; creek and city, Sask. (Not Moose Jaw.)
*Mooshaulagan.* See Mushalagan.
*Mooyie.* See Moyie.
**Moraine**: lake, south of mount Temple, Alberta.
*Moran.* See Moras.
**Moras**; island, at mouth of Nicolet river, Nicolet county, Que. (Not Moran.)
**Moreau**; islet, St. Lawrence river, opposite St. Germain, Kamouraska county, Que.
**Moresby**; island and passage, in the north end of Haro strait, B.C.
**Morgan**; lake, south of Silver lake, Kenora district, Ont.
**Morice**; lake and river, tributary to Bulkley river, Coast district, B.C. (Not Morrice.)
**Moricetown**; village, on Bulkley river, Coast district, B.C. (Not Morricetown.)
**Morien**; bay and cape, in the northeasterly portion of Cape Breton county, N.S. (Not Cow nor Murgin.)
*Morien Bay* (village). See Port Morien.
**Morin**; creek, flowing northeasterly into Meadow creek, central Sask. (Not Bear.)
**Morin**; shoal, centre of channel about 8 miles above Hare island, St. Lawrence river, Que.
**Morley**; river, emptying into Teslin lake, Yukon.
*Morrice.* See Morice.
*Morricetown.* See Moricetown.
**Morris**; lake, Tp. 17, R. 1, E. P.M., Manitoba. (Not Norris.)
**Morris**; river, tributary to Red river, Man. (Not Boyne, Isles de Bois nor Scratching.)
**Morris**; town, in southern Manitoba.
**Morrison**; mount, on Yukon river, near international boundary, Yukon.
**Morrissey**; town, creek, and ridge, south of Fernie, Kootenay district, B.C.
**Morse**; basin, east of Kaien island, Coast district, B.C.

**Morse**; creek, Prince Rupert harbour, Coast district, B.C.

**Morse**; mount, south of Tuck inlet, Coast district, B.C.

**Moses Oates**; cape, Charles island, Hudson strait, N.W.T.

**Mosher**; creek and ridge, west of Beaverhill creek, Similkameen district, B.C.

**Mosher**; island and point, E. side of St. Margaret bay, Halifax Co., N.S. (Not Grampus.)

**Mosquito**; creek, tributary to Bonanza creek, Yukon.

*Mosquito.* See Arrowpark.

**Mossy**; river, flowing from Dauphin lake to lake Winnipegosis, Manitoba.

**Mouat**; channel and reef, off southeast point of Vancouver island, B.C. (Not Mouatt.)

**Mouat**; islands, off S.W. coast of Texada I., New Westminster dist., B.C. (Not Mouatt.)

**Mouat**; point, W. point of Pender I., New Westminster dist., B.C. (Not Mouatt.)

**Mouat**; rock, in Goletas channel, northern coast of Vancouver I., B.C. (Not Mouatt.)

*Mouatt.* See Mouat.

*Mouchalagan.* See Mushalagan.

*Mouile.* See Mouillée.

*Mouille.* See Mouillée.

**Mouillée**; point, in St. Lawrence R., Glengarry Co., Ont. (Not Mouile nor Mouille.)

*Moulie's.* See Molus.

**Mountain**; lake, on international boundary, Thunder Bay district, Ont.

**Mountain**; lake, southwest of lake Lindeman, Cassiar district, B.C. (Not Long lake.)

*Mountain.* See Cliff.

*Mountain.* See Liard.

*Mountain.* See Watchi.

**Mount Johnson**; post office, Iberville Co., Que. (Not St. Grégoire.)

*Mt. Pleasant.* See Mohawk.

**Mourier**; lake, Desroberts township, Timiskaming Co., Que. (Not Wikwaskapauk.)

*Mouse.* See Maus.

**Mowat**; mount, about three miles north of Grant Brook station, G.T.P.R., Cariboo district, B.C.

**Moyie**; lake, river and town, in S.W. portion of Kootenay dist., B.C. (Not Mooyie.)

**Muchalat**; arm, the eastern arm of Nootka sound, Vancouver island, B.C. (Not Guaquina.)

**Muchalat**; lake and river, headwaters of Gold river, Nootka district, Vancouver island, B.C.

**Muchuya**; creek, tributary to Kakuchuya river, Cassiar district, B.C.

**Mud**; glacier, northeast of mount Purity, Selkirk mountains, Kootenay district, B.C.

*Mud.* See Bayfield.

*Mud.* See Chilako.

*Mud.* See Gillies.

*Mud.* See Kabagukski.

*Mud.* See Kikomun.

*Mud.* See Mance.

*Mud.* See Rose.

*Muddy.* See Pikitigushi.

*Muddy Water.* See Apeganau.

**Mudge**; island, between Gabriola and Vancouver islands, B.C.

**Mudie**; lake, south of Beaver river and north of Ministikwan lake, central Sask.

**Mudjatik**; river, tributary to Churchill river, north of Ile à la Crosse, Sask. (Not Caribou nor Mudjatick.)

**Muhigan**; river, emptying into Sipiwesk lake, Man. (Not Wolf nor Wolf Rand.)

**Muir**; creek, flowing into Juan de Fuca strait, also mountain, Vancouver island, B.C.

**Muirkirk**; railway station and village, Oxford Tp., Kent Co., Ont. (Not Muir Kirk.)

**Mukoman**; river, tributary to Churchill river, Saskatchewan.

**Mulcaster**; island, Navy group, St. Lawrence river, Leeds county, Ont. (Not Sugar.)

**Muldrew**; lakes (2), west of Gravenhurst, Muskoka district, Ont. (Not Leg lake nor Rice lake.)

**Mulholland**; point, Campobello island, Charlotte county, N.B. (Not Mulholland's, Meholland nor Mehollan.)

**Mulvey**; creek, tributary to Slocan river, Kootenay district, B.C.

**Mumm**; peak, north of Robson pass, Rocky mountains, Cariboo district, B.C.

**Mummery**; mountain, west of Blaeberry river, Rocky Mts., Kootenay district, B.C.

*Munosahn.* See Manasan.

*Munquart.* See Monquart.

**Munro**; creek, emptying into Gladys lake, Cassiar district, B.C.

**Munro**; mount, east of Atlin lake, Cassiar district, B.C.

**Munro**; point, St. Ann harbour, Victoria county, N.S. (Not Monroe nor Munro's.)

**Munroe Mills**; hamlet, Glengarry Co., Ont. (Not Munro's Mills nor Munroe's Mills.)

**Murchison**; cape, southeast end of Brevoort island, N.W.T.

**Murchison**; island, L. Nipigon, Thunder Bay district, Ont. (Not Murchison's.)

**Murchison**; mount, also icefield, east of Mistaya river, Rocky mountains, Alta.

*Murgin.* See Morien.

**Muriel**; lake, Tps. 59 and 60, R. 5, W. 4 M., eastern Alberta.

**Murphy**; harbour and point, south shore of Manitoulin I., Manitoulin district, Ont.

**Murphy**; lakes, north of Tulameen river, Yale district, B.C. (Not Eagle nor Fish.)

**Murray**; canal, in Murray and Brighton townships, connecting the bay of Quinte with Presqu'île bay, Northumberland county, Ont.

**Murray**; creek, tributary to Sutherland river, south of Lesser Slave lake, central Alta.

**Murray**; island, Cold lake, on boundary line, Alberta and Saskatchewan.

**Murray**; island, St. Lawrence river, below Brockville, Leeds county, Ont.

**Murray**; lake, east of Jackfish lake, central Saskatchewan.

**Murray**; point, Markham bay, Hudson strait, N.W.T.

**Murray**; reef and rocks, near Dead island, entrance of Key harbour, Georgian bay, Parry Sound district, Ont.

**Murray**; river, tributary to the St. Lawrence, Charlevoix county, Que. French usage: Malbaie (rivière).

**Murray Bay** (Eng. usage), Malbaie (Fr. usage); village, Charlevoix county, Que. (Not Mal Bay, Malbay nor Malbaye.)

**Murtle**; lake and river, tributary to Clearwater river, Kamloops district, B.C. (Not Myrtle.)

**Muscote**; bay, off Big bay, S.W. side of the bay of Quinte, Prince Edward Co., Ont.
**Mushalagan**; lake, Saguenay county, Que. (Not Mooshaulagan nor Mouchalagan.)
*Mushonga.* See Pemichangan.
**Muskiki**; lake, north of Dana, Saskatchewan. (Not Houghton.)
**Muskoka**; lake and river, Muskoka district, Ont.
*Muskosibi.* See Mistassibi.
*Muskrat.* See Manigotagan.
**Muskwa**; river, flowing easterly into Fort Nelson river, near the H. B. Co. post, Peace River district, B.C. (Not Sikanni.)
**Muskwaro**; point and river, Saguenay county, Que. (Not Musquarro.)
**Muskwesi**; river, flowing into north end of Southern Indian lake, Man.
**Mussen**; mount, near southern end of Atlin lake, Cassiar district, B.C.
**Mutchmore**; point, south shore of Manitoulin island, Manitoulin district, Ont.
**Mya**; point, Shippigan island, Gloucester county, N.B. (Not South Mya.)
*Mya.* See Miscou.
**Myers**; island, southwest of Lynedoch island, St. Lawrence river, Leeds county, Ont.
**Myers**; point, Sidney township, Hastings county, Ont.
**Myles**; shoal, opposite Kingston, Frontenac county, Ont. (Not Royal George.)
**Myra**; cove and island, Blind bay, Halifax county, N.S. (Not Myra's.)
*Myrtle.* See Murtle.
**Mystery**; lake, southwest of Cliff lake, Kenora district, Ont.

## N

*Na-a-ma.* See Nemaia.
*Naas.* See Nass.
*Nabesipi.* See Nabisipi.
*Nabesippi.* See Nabisipi.
**Nabisipi**; river, north shore gulf of St. Lawrence, Saguenay county, Que. (Not Nabesipi nor Nabesippi.)
*Nacawicac.* See Nackawic.
**Nackawic**; river and village, York county, N.B. (Not Nacawicac nor Nackawick.)
**Nadahini**; river, tributary to Chilkat river, Cassiar district, B.C.
**Nadina**; mountain, and river flowing into François lake from the west, Coast district, B.C. (Not Nadinaka river nor Nadinako river.)
**Nahlin**; river, tributary to Inklin river, Cassiar district, B.C.
**Nahoni**; mountains, also lakes (upper, lower and middle), at headwaters of Porcupine river, Yukon. (Not Nahone.)
**Nainlin**; brook, tributary to Gravel river, Mackenzie river, N.W.T.
**Najan**; river, tributary to St. Maurice river, above Manuan river, Champlain Co., Que.
*Najualand.* See Najwalwank.
**Najwalwank**; lake, Quebec county, Que. (Not Kajoualwang nor Najualand.)
**Nakimu**; caves, in valley of Cougar creek, Selkirk mountains, Kootenay district, B.C.
**Nakina**; river, tributary to Taku river, Cassiar district, B.C.
**Nakonake**; river, tributary to Sloko river, Cassiar district, B.C.

**Nakusp**; creek, railway terminus and town, east side of Upper Arrow lake, Kootenay district, B.C. (Not Na-Kusp.)

**Nakwagami**; lake, Montmorency and Quebec counties, Que. (Not Naquagami.)

*Nalta.* See Fraser

**Naltesby**; lake, on telegraph trail, N. of Chilako R., Cariboo dist., B.C. (Not Bobtail.)

**Namaka**; lake, post office, and railway station, southern Alberta.

**Namakan**; lake, southeast of Rainy lake, international boundary. Rainy River district, Ont. (Not Nameukan.)

**Namawash**; lake, upper Ottawa river, northwest of Grand lake Victoria, Timiskaming county, Que.

**Namego**; lake, south of Separation lake, Kenora district, Ont.

**Namegos**; lake, south of Matchimanito lake, Montcalm Co., Que. (Not Nemegos.)

**Namegosis**; lake, south of Matchimanito lake, Montcalm Co., Que. (Not Nemegosis.)

**Nameiben**; lake, north of Kagianagami lake, Thunder Bay district, Ont.

**Nameins**; rapids, upper Winisk river, Patricia district, Ont.

*Nameukan.* See Namakan.

**Namew**; lake, northeast of Cumberland lake, Sask. and Man. (Not Sturgeon.)

*Namiska.* See Nemiskau.

*Namoukan.* See La Croix.

**Nanaimo**; harbour, river and town, Vancouver island, B.C.

**Nankika**; lake, northwest of Attawapiskat lake, Patricia district, Ont.

**Nankivell**; islands, Blunden harbour, Queen Charlotte sound, Coast district, B.C.

**Nankivell**; point in Nanoose harbour, east coast of Vancouver island, B.C.

**Napetipi**; river, north shore of the gulf of St. Lawrence, Saguenay county, Que.

*Naquagami.* See Nakwagami.

**Narchilla**; brook, emptying into McPherson lake, Yukon.

**Nares**; lakes, between Bennett and Tagish lakes, Yukon.

**Nares**; mount, east of north end of Bennett lake, Yukon.

**Nares**; point, Departure bay, east coast of Vancouver island, B.C. (Not Boulder.)

*Narrow.* See Bagot.

*Narrow.* See Oboshkegan.

*Narrow.* See Wallace.

**Nasoga**; gulf, Portland inlet, Coast district, B.C. (Not Nasoka.)

**Nass**; bay and river, Cassiar district, B.C. (Not Naas, Nasse nor Naas harbour.)

**Natashkwan**; harbour, point, and river, Saguenay county, Que. (Not Englishman's nor Natashquan nor Little Natashquan.)

**Natchipotchi**; lake, at head of Etchipotchi R., Abitibi territory, Que. (Not Natchipoishi.)

**Nation**; river, tributary to Yukon river, international boundary, Yukon.

*Nation.* See Petite-Nation.

*Nation.* See South Nation.

**Natla**; river, tributary to Gravel river, Mackenzie river, N.W.T.

*Naufrage.* See Refuge.

**Naumulten**; mountain, east of head of Lower Arrow lake, Kootenay district, B.C.

**Nauyats**; island, southeast shore of Ungava bay, N.W.T.

**Navy**; group of islands, St. Lawrence river, below Gananoque, Leeds county, Ont.

**Navy**; island, Bedford basin, Halifax harbour, Halifax county, N.S. (Not Stephens nor Stevens.)

*Nawapitechin.* See Villemontel.

*Neal.* See Neil.

**Neale**; lake, northeast of Lloydminster, Saskatchewan.

**Nechako**; river, tributary to Fraser river, Cariboo and Coast districts, B.C. (Not Nechaco nor Nechacco.)

**Nechigona**; lake, at headwaters of Berens river, Patricia district, Ont. (Not Hair.)

**Neck**; point, north entrance to Hammond bay, S.E. coast of Vancouver island, B.C.

**Nedluk**; lake, west of Koksoak river, New Quebec.

**Needle**; mountain, between the "big bends" of Watson and Wheaton rivers, Yukon.

**Needles Eye**; island, Brock group, St. Lawrence river, Leeds county, Ont.

**Negik**; lake, south of Churchill river, and east of Pelican narrows, Saskatchewan.

**Negro**; cape, the southeast extreme of Cape Negro island, Shelburne county, N.S.

**Negro**; harbour, Shelburne county, N.S.

*Negro.* See Cape Negro.

**Neil**; harbour, Cape Breton county, N.S. (Not Neal, Neals nor Neil's.)

**Neilson**; island, southeast of Stone island, Clayoquot sound, Vancouver island, B.C.

**Nelles**; hamlet, Haldimand county, Ont. (Not Nelles Corners nor Nelles' Corner.)

*Nelles Corners.* See Nelles.

**Nello**; river, headwaters of Klondike river, Yukon.

**Nelly**; point, on the northwest portion of Princess Royal island, Coast district, B.C.

**Nelson**; lake, on Churchill river, Manitoba.

**Nelson**; lake, west of Edgar lake, Cassiar district, B.C.

**Nelson**; mount, at head of Clearwater and Slade creeks, west of Windermere lake, Kootenay district, B.C. (Not Hammond.)

**Nelson**; river, flowing from lake Winnipeg into Hudson bay, Manitoba The two channels by which it drains the lake are East channel and West channel. (Not East river and West river.)

*Nelson.* See Fort Nelson.

**Nemaia**; lake and valley, northeast of Chilko lake, Coast and Lillooet districts, B.C. (Not Na-a-ma.)

*Nemegos.* See Namegos.

*Nemegosis.* See Namegosis.

**Nemei**; river, tributary to Churchill R., below Reindeer R., Sask. (Not Sturgeon.)

**Nemeiben**; bay, lake and river, L. LaRonge, Saskatchewan.

**Nemeibennuk**; lake, W. of Anzhekumming L., Kenora district, Ont. (Not Sucker.)

**Nemeigusabins**; lake, near the upper waters of Winisk river, Patricia district, Ont.

**Nemikachi**; lake, near the upper waters of Lièvre river, Maskinongé county, Que. (Not Nemicachingue.)

**Nemiskau**; lake, expansion of Rupert river, Mistassini territory, Que. (Not Namiska.)

**Nemo**; creek, west of Slocan lake, Kootenay district, B.C.

*Ne-na-tik-go.* See Ninatigo.

*Nepigon.* See Nipigon.

*Nepihjee.* See Leaf.

*Nepisiguit.* See Nipisiguit.

**Nepopekum**; creek, tributary to Skagit river, Yale district, B.C.

**Neptuak**; mountain, northwest of Deltaform mountain, Rocky mountains, Alberta, and Kootenay district, B.C.

**Neptune Head**; point, at entrance to Stupart bay, Hudson strait, New Quebec.

*Nequaquon.* See La Croix.

*Nesto.* See Hippa.

**Neston**; lake, west of lake Devizes, Thunder Bay district, Ont.

**Net**; lake, Cassels and Strathy townships, Nipissing district, Ont.

**Netley**; creek and lake, south of lake Winnipeg, Man. (Not Nettly nor Nipuwin.)

**Netley**; island, Lake Fleet group, St. Lawrence river, Leeds county, Ont.

*Net Setting.* See Setting.

**Nettie L.**; mountain, northeast of Ferguson, Kootenay district, B.C.

**Neutral**; hills, west of Sounding lake, southeastern Alberta.

*Neux.* See Auneuse.

**Nevin**; mount, west of Hendon river, Cassiar district, B.C. and Yukon.

**Newagama**; lake, southeast of Abitibi lake, Timiskaming county, Que.

**Newburg**; railway station, Carleton Co., N.B. (Not Newburg Junction.)

*Newburg Junction.* See Newburg.

**New Canaan**; hamlet, Kings county, N.S. (Not Canaan.)

**Newell**; sound, southwest shore of Frobisher bay, N.W.T. (Not Kangerflung.)

*New Galloway.* See Galloway.

*New Galway.* See Galloway.

*New Liskeard.* See Liskeard.

**Newman**; peak, Tp. 3, R. 1, W. 5 M., southern Alberta. (Not Newman's.)

**Newmarket**; post village, York county, N.B. (Not New Market.)

**New Richmond**; lightstation, township and village, Bonaventure county, Que. (Not Richmond.)

**Newross**; hamlet, Dundas county, Ont. (Not New Ross.)

**Newton**; fiord, Frobisher bay, N.W.T. (Not Tornait.)

*Newton.* See Newtown.

**Newtown**; village, Kings county, N.B.

**Newtown**; village, Guysborough county, N.S. (Not Newton nor New Town.)

*New Wiltshire.* See Wiltshire.

**New Zealand**; creek, tributary to Indian river, Yukon.

**Niagara**; island, Lake Fleet group, St. Lawrence river, Leeds county, Ont.

*Niagara.* See Crossman.

**Nibinamik**; lake, southwest of Wapikopa lake, upper Winisk river, Patricia district, Ont.

**Niblock**; mount, also pass, northeast of Popes peak, Alberta.

**Nicholas**; islets, northeast of Vansittart island, Queen Charlotte sound, Coast district, B.C. (Not Nicolas.)

*Nicholson.* See Parrott.

*Nickadow.* See Nigadu.

**Nicoamen**; plateau and river, Kamloops district, B.C. (Not Nicomen.)

**Nicol**; lake, Lorrain township, Timiskaming district, Ont.

**Nicola**; lake, mountain, plateau, town, valley and river, Kamloops district, B.C. "Upper Nicola," applied to that portion of the river east of Nicola lake, to be dropped.

*Nicolas.* See Nicholas.

**Nictau**; settlement, at the forks of Tobique river, Victoria county, N.B.

**Nictor**; lake, headwaters of Tobique river, Restigouche county, N.B.

*Nictor.* See Tobique.

**Niddery**; islands, northeast of Lynedoch island, St. Lawrence river, Leeds county, Ont.

**Nidhe**; brook, tributary to Gravel river, above Ekwi river, N.W.T.

**Nigadu**; river and village, Gloucester Co., N.B. (Not Nickadow, Nigado nor Nigadoo.)

*Niganishe.* See Ingonish.

**Nigei**; island, near northwest end of Vancouver island, B.C. (Not Galiano.) To avoid duplication. See Galiano island, strait of Georgia.

**Nigger**; island, between Belleville and Trenton, Hastings county, Ont.

**Nigger**; narrows, bay of Quinte, Hastings county, Ont. (Not Nigger island narrows.)

**Nikabau**; lake and river, headwaters of Ashuapmuchuan river, Chicoutimi county, Que.

**Nikanassin**; range of mountains, extending from the upper end of Brûlé lake on Athabaska river to the north branch of Brazeau river, Alberta.

**Niles**; mount, southeast of mount Balfour, Kootenay district, B.C.

**Nimpkish**; lake and river, in northwest portion of Vancouver island, B.C. (Not Karmutsen lake nor Kla-anch river.)

**Nimrod**; lake, southwest of Bakado lake, Kenora district, Ont.

**Ninatigo**; lake, Stanhope township, Haliburton county, Ont. (Not Ne-na-tik-go.)

**Ninemile**; point, also Ninemile Point lightstation, southwest end of Simcoe island, Frontenac county, Ont. (Not Gage.)

**Ninette**; island, Navy group, St. Lawrence river, Leeds county, Ont. (Not Mink.)

**Niord**; mountain, west of Slocan lake, Kootenay district, B.C.

**Nipigon**; bay, lake, river, and village, Thunder Bay district, Ont. (Not Nepigon nor Neepigon.)

**Nipisiguit**; lake, river, and bay, Gloucester county, N.B. (Not Nepisguit, Nipisiquit nor Nipisghit.)

*Nipisiguit Millstream.* See Millstream river.

**Nipmenanni**; river, a tributary of Shoshokwan river, upper Ottawa river, Pontiac county, Que. (Not Nipmenane.)

**Nipple**; mountain, east of Frances lake, Yukon.

**Nipukatasi**; river, emptying into Kenoniska lake, southeast of lake Evans, Abitibi territory, Que. (Not Nipukatase.)

*Nipuwin.* See Netley.

*Nisconlith.* See Niskonlith.

*Niskainlith.* See Niskonlith.

*Niskitogisew.* See Kiskittogisu.

**Niskonlith**; Indian reserve, lake and river, southwest of Little Shuswap lake, Kamloops district, B.C. (Not Nisconlith nor Niskainlith.)

**Nisling**; river, tributary to White river, east of Wellesley lake, Yukon. (Not Tahte.)

*Nistowasis.* See Threepoint.

**Nisutlin**; river, emptying into Teslin lake, Yukon.

**Nith**; river, flowing into Grand river, Brant, Oxford and Waterloo counties, Ont. (Not Smith's creek.)

**Niut**; range of mountains, on the western side of Tatlayoko lake, Coast district, B.C.

*Nixon.* See Towincut.

*Noddawai.* See Nottaway.

*Nodway.* See Nottaway.

*Noeds.* See Auneuse.

**Noel**; harbour, Crooks inlet, Hudson strait, N.W.T.

*Noel.* See Nowell.

**Nogold**; creek, tributary to Stewart river, Yukon.

**Nohomin**; creek and Indian reserve, near Lytton, Kamloops and Yale districts, B.C. (Not No-ho-meen.)

**Noire** (rivière); river, flowing into the St. Lawrence below St. Siméon, Charlevoix Co., Que.

**Noix** (île aux); island, Richelieu river, St. Johns county, Que. (Not Fort Lennox.)

**Nolin**; island, at junction of Attawapiskat and Boulder rivers, Patricia district, Ont.

**Nomining**; lake and village, Labelle Co., Que. (Not Nominingue.)

**Nonwatin**; lake and river, tributary to Black Sturgeon river, south of L. Nipigon, Thunder Bay district, Ont. (Not Nonwatan.)

**Nonwatinose**; lake, on Black Sturgeon river, south of lake Nipigon, Thunder Bay district, Ont.

*Noolki.* See Nulki.

*Noores.* See Bath.

**Norbury**; lakes (2), east of Fenwick station, Kootenay district, B.C. (Not Fish.)

**Nordegg**; river, tributary to Brazeau river, central Alberta. (Not Little Brazeau.)

**Nordenskiöld**; river, tributary to Lewes river, Yukon.

**Norman**; settlement and H.B. Co. post, at confluence of Great Bear river and Mackenzie river, N.W.T. (Not Fort Norman.)

**Normand**; lake, Normand township, Champlain county, Que. (Not Wakaumekonke.)

**Norns**; mountains, southeast of Airy mountain, Kootenay district, B.C.

**Norquay**; mount, northwest of Banff, Alberta.

*Norris.* See Morris.

**Norse**; lake, north of Rosamond lake, Kenora district, Ont.. (Not Nurse.)

**North**; bay, north shore of Hudson strait, N.W.T.

**North**; channel, between Manitoulin I. and mainland, Manitoulin dist., Ont.

**North**; lake, Harburn township, Haliburton county, Ont.

**North**; lake, on international boundary, Thunder Bay district, Ont.

*North* See Gladys.

*North.* See Hall.

*North.* See Langara.

*North.* See Old Factory.

**North Albert**; peak, northwest of Albert peak, Selkirk Mts., Kootenay district, B.C.

*North Antler.* See Gainsborough.

*North Corner.* See Norths.

*North Cornwall.* See Cornwall.

*North Devon.* See Devon.

**North Duck**; river, flowing easterly and northerly to Duck bay, lake Winnipegosis, Man. (Not Duck River North.)

*North Branch* (Kicking Horse river). See Amiskwi river.

**Northeast**; bay, Shabogama lake, Pontiac county, Que.

*Northfield.* See Hennigar.

*North Foreland.* See Long Point.

*North Foreland.* See Queen Elizabeth.

*North Fork of Bridge* (river). See Yalakom.

*North Fork* (Cooper creek). See McKian.

*North Fork of Cross* (river). See Mitchell.

*North Fork* (Fry creek). See Carney.

*North Fork* (Lardeau creek). See Ferguson.

*North Fork of Kettle river.* See Granby.

*North Fork* (Michel creek). See Alexander.

*North Fork.* See Yoho.

**North Fork**; pass, west of Gould Dome mountain, Alta., and Kootenay district, B.C.

**North Fowl**; lake, on international boundary, Thunder Bay district, Ont. (Not Hen.)

**North Head**; harbour, port of entry and village, on northern portion of Grand Manan island, Charlotte county, N.B. (Not Flag, Flag's nor Flagg's cove, Grand Manan harbour, nor North Road village.)

**North Heart**; river, tributary to Peace river, below Smoky river, Alberta.

**North Kootenay**; pass, in the Rocky mountains, near the headwaters of Flathead river, Alta., and Kootenay district, B.C.

North Lincoln. See Ellesmere.

*North Lizard.* See Rowe.

*North Mya.* See Miscou.

*North Nation.* See Petite-Nation.

*North of Halfway.* See Meule.

*North.* See Garibaldi.

*North Porpoise.* See Ridley.

**Northport**; shoal and village, Sophiasburg township, Prince Edward county, Ont.

*North Road.* See North Head.

**North Rustico**; lightstation and post village, Queens Co., P.E.I. (Not Grand Rustico.)

**Norths**; village, Kings county ,N.S. (Not North Corner.)

*North Skeena.* See Inverness.

*North Somerset.* See Somerset.

**North Star**; hill, north of St. Mary river, Kootenay district, B.C.

*North Tacla.* See Takla.

**Northumberland**; channel, between Gabriola and Vancouver islands, B.C.

*Northumberland.* See Cumberland.

**North Vermilion**; settlement, on north side of Peace river, Alberta.

**Northwest Angle**; also Northwest Angle inlet, lake of the Woods, international boundary, Man., Ont. and U.S.

*North Wiltshire.* See Wiltshire.

**North Wind**; lake, southeast of Humboldt bay, lake Nipigon, Thunder Bay district, Ont. (Not North Wing.)

**Norway**; island, northeast of Kuper island, southeast coast of Vancouver I., B.C.

*Nose.* See Ribstone.

**Notre-Dame-des-Laurentides**; parish, Quebec county, Que.

**Notre-Dame-de-Pontmain**; parish, Labelle county, Que. (Not Notre-Dame du Port Main.)

**Notre-Dame-du-Portage**; village, Temiscouata county, Que.

**Nottaway**; river, flowing from Mattagami lake into James bay, Abitibi territory, Que. (Not Noddawai nor Nodway.)

**Notukeu**; creek, flowing easterly into Wood river, southern Saskatchewan.

*Novelist.* See Palmer.

**Nowell**; channel, in easterly portion of Queen Charlotte sound, B.C. (Not Noel.)

**Noyes**; mount, southeast of Waterfowl lakes, Rocky mountains, Alberta.

**Nozheiatik**; lake, east of Anzhekumming lake, Kenora district, Ont.

**Nubble**; mount, Goschen island, Hecate strait, Coast district, B.C.

**Nulki**; lake, on telegraph trail, south of Nechako R., Coast dist., B.C. (Not Noolki.)

*Number 2* (creek). See Forster.

*Number 3* (creek). See Frances.

*Numnekaning.* See Nunikani.

**Nunikani**; lake, Sherborne township, Haliburton county, Ont. (Not Numnekaning.)

**Nuns**; island, in the St. Lawrence, near Montreal, Laval county, Que. (Not Nun nor St. Paul.) French usage; Sœurs (île des)—which see. Previous decision enlarged.

*Nurse.* See Norse.

*Nusheth.* See Hill Island.

**Nut**; lake and mountain, also Nut Mountain, post office, eastern Saskatchewan.

**Nutt**; village, Missisquoi county, Que. (Not Nutt's Corners.)

*Nutt's Corners.* See Nutt.

**Nyarling**; river, tributary to Little Buffalo river, south of Great Slave lake, N.W.T.

## O

**Oak**; lake, English river, above Maynard lake, Kenora district, Ont.

**Oak**; lake, Methuen township, Peterborough county, Ont.

**Oak**; point, also Oak Point, village, west shore of lake Manitoba, Man.

**Oakbank**; village, east of Winnipeg, Man. (Not Oak Bank.)

*Oakland.* See Slaughenwhite.

**Oakville**; creek and town, Halton Co., Ont. (Not Sixteen Mile creek.)

*Obadowagashing.* See Dasserat.

**Obalski**; lake, Béarn, Castagnier, Dalquier and Duverny Tps., Timiskaming Co., Que.

**Obashi**; lake, northwest of Attawapiskat lake, Patricia district, Ont.

**Obashing**; lake, Timiskaming county, Que. (Not Big Obashing.)

**Obashkong**; lake, Cassels township, Nipissing district, Ont.

**Obaska**; lake, north of Grand L. Victoria, Timiskaming county, Que. (Not Obiska.)

**Obatawagush**; lake, west of Harricanaw river, Abitibi territory, Que.

**Obatogamau**; lake, at height-of-land south of Chibougamau L., Abitibi territory, Que.

**Obiduan**; lake, at headwaters of St. Maurice river, Champlain county, Que.

**Obikoba**; lake, northeast of lake Timiskaming, Timiskaming county, Que.

*Obiska.* See Obaska.

**Obonga**; lake, west of lake Nipigon, Thunder Bay district, Ont.

**Oboshkegan**; lake, south of N. T. railway and north of Onaman lake, Thunder Bay district, Ont. (Not Narrow.)

**Obowanga**; river, northwest of Obonga lake, Thunder Bay district, Ont.

**O'Brien**; creek, at international boundary, below Dawson, Yukon.

**Observation**; butte, near Gun lake, north of Nahlin river, Cassiar district, B.C.

**Observation**; peak, east of Peyto lake, Alberta. (Not Mount Observation.)

*Observation.* See Jupiter.

**Ochig**; lakes, north of L. St. Joseph, Patricia district, Ont.

*O'Connor.* See Kaskawulsh.

**O'Conor**; island, Navy group, St. Lawrence river, Leeds Co., Ont. (Not O'Connor.)

**Octave**; river, flowing northeasterly from Chikobi lake to Harricanaw river, Abitibi territory, Que. (Not Shi-shi-shi.)

**Octopus**; islands, at the entrance to Waiatt bay, Okisollo channel, Coast district, B.C.

**Odaray**; mount, south of Cathedral mountain, Kootenay district, B.C.

**Odaray**; pass, between Mts. Duchesnay and Odaray, Yoho park, Rocky Mts., Kootenay district, B.C.

**Odei**; river, tributary to Burntwood river, Manitoba. (Not Sahpoochaway.)

**Odellach**; river, tributary to Tobique river, Victoria county, N.B. (Not Otelloch.)

**Odin**; mount, west of Upper Arrow lake, Kootenay district, B.C.

**O'Donnel**; river, emptying into the east side of Atlin lake, Cassiar district, B.C. (Not Dixie creek.)

*O'Drain's.* See Wemps.

**Oesa**; lake, southwest of mount Lefroy, Kootenay district, B.C.

**Ogani**; lake, on Wenasaga river, northwest of lac Seul, Patricia district, Ont. (Not Oganie nor Powingow.)

**Ogden**; mount, northwest of Hector station, Rocky mountains, Kootenay district, B.C.

**Ogilvie**; creek, emptying into the north end of lake Laberge, Yukon.

**Ogilvie**; post on Yukon river, near the mouth of Sixtymile river, Yukon.

**Ogilvie**; range of mountains, central Yukon.

**Ogilvie**; valley, north of lake Laberge, Yukon.

**Ogoki**; lake and river, tributary to Albany R., Thunder Bay dist., Ont. (Not Tiernan.)

**Ogre**; peak, near headwaters of Amiskwi river, Rocky Mts., Kootenay district, B.C.

**O'Hara**; lake, west of mount Lefroy, Rocky Mts., Kootenay dist., B.C. (Not Cascade.)

**Oies** (cap aux); cape, below Coudres island, St. Lawrence river, Charlevoix county, Que. English usage, Goose cape.

**Oiseau**; lake and river, southeast of lake Winnipeg, Man. (Not Bird.)

**Oke**; mount, south of Misko pass, Yoho park, Rocky Mts., Kootenay district, B.C.

**O'Keefe**; mount, between Sloko and Silver Salmon rivers, Cassiar district, B.C.

**Okemasis**; lake, east of Carlton, central Saskatchewan. (Not Stony.)

**Okikodosik**; river, flowing southwesterly into Abitibi lake, Timiskaming, Ont. and Que. (Not Okikodosec.)

**Okisollo**; channel, between Quadra and Sonora Is., Coast dist., B.C. (Not Okishollow.)

**Okotoks**; mountain, post office and railway station, southern Alberta.

*Old Bluff.* See Yeo.

**Old Factory**; river, emptying into James bay, New Quebec. (Not North.)

*Oldfield.* See Hays.

**Old Fort**; bay and point, in southwestern portion of Athabaska lake, also river flowing into the bay, Alberta.

**Oldman**; river, flowing easterly from the foothills of the Rockies to the confluence of the Bow and South Saskatchewan rivers, Alberta. (Not Old Man's.)

**Oldman**; rock, Yukon river, between Cudahy and international boundary, Yukon.

*Old Wives.* See Chaplin.

**Oldwoman**; rock, Yukon river, near Oldman rock, Yukon.

**Olga**; lake, southeast of Mattagami lake, Abitibi territory, Que.

**Olga**; river, north shore of Hudson strait, N.W.T.

**Olive**; mountain, northeast of mount Gordon, Rocky mountains, Alberta.

**Oliver**; mount, southwest of mount Bonney, Selkirk mountains, Kootenay District, B.C.

**Olivine**; mountain, south of Tulameen river, Yale district, B.C.

**Olomanoshibo**; river, Saguenay Co., Que. (Not Olomanosheebo nor Olomonasheebou.)

**Omanek**; island, east shore of Ungava bay, N.W.T.

**Omatuwi**; lake, north of Split lake, Nelson river, Manitoba. (Not O-Ma-Tou-Wi.)

**Ombabika**; bay, island and river, N. shore of L. Nipigon, Thunder Bay district, Ont.

*Omenica.* See Omineca.

**Omineca**; mountains and river, Cassiar, B.C. (Not Omenica, Ominica nor Omeneca.)

**Onamakawash**; lake, southwest of Smoothrock lake, Thunder Bay district, Ont.

**Onaman**; lake and river, emptying into Humboldt bay, Nipigon lake, Thunder Bay district, Ont. (Not Onamanisagi.)

**Onatamini**; brook, flowing into Wekusko lake, Manitoba.

**Onderdonk**; point, Ameliasburg township, Prince Edward county, Ont.

**O'Neil**; island, west of Grenadier island, St. Lawrence river, Leeds county, Ont. (Not Bluff nor Hog.)

**O'Neil**; hamlet, Huntingdon county, Que. (Not O'Neil's Corners nor O'Neil Corners.)

*O'Neil's Corners.* See O'Neil.

**Oneman**; lake, English R., Kenora district, Ont. (Not Lone Man's nor One Man's.)

*One Mile* (creek). See Allison.

**Onkammis**; lake, at headwaters of St. Maurice river, Champlain county, Que.

*Oosilinka.* See Osilinka.

*Ooskootim.* See Wuskwatim.

**Ootsa**; lake, southwest from François lake, Coast district, B.C. (Not Ootsabunket.)

**Opabin**; creek, tributary to Brazeau river, Alberta. (Not Boulder nor Rocky.)

**Opachuanau**; lake, on Churchill river, below Nemei river, Sask. (Not Pachewanow.)

**Opal**; mountains, east of Kananaskis river, Rocky Mountains park, Alta.

*Opamiska.* See Opemiska.

**Opasatika**; lake, south of Abitibi lake, Timiskaming county, Que.

**Opatawaga**; lake, northwest of Mattagami lake, Abitibi territory, Que. (Not Opiwatakan.)

**Opawika**; river, tributary to Waswanipi river, Abitibi territory, Que.

**Opegano**; lake, on Burntwood river, Manitoba.

**Opemiska**; lake, west of Chibougamau lake, Abitibi territory, Que. (Not Opamiska.)

**Opeongo**; lake and river, in southeastern portion of Algonquin National park, Nipissing district, Ont. (Not Great Opeongo lake.)

*Opequanne.* See Opikwan.

*Opequon.* See Opikwan.

**Ophir**; creek, tributary to Indian river, Yukon.

**Opichuan**; river, flowing to Nameiben L., Thunder Bay dist., Ont. (Not Opichewan.)

**Opikeigen**; lake, northwest of Eabemet lake, Patricia district, Ont.

**Opikwan**; lake, upper waters of Ottawa river, Pontiac county, Que. (Not Opequanne nor Opequon.)

*Opinaca.* See Opinaka.

**Opinaka**; river, tributary to Eastmain river, New Quebec. (Not Opinaca nor Straight.)

**Opinnagau**; river, north of Ekwan river, Patricia district, Ont. (Not Upinnakaw.)

**Opitsat**; Indian village, southwest end of Meares island, Clayoquot sound, Vancouver island, B.C. (Not Clayoquot.)

*Opiwatakan.* See Opatawaga.

**Oponask**; lake, northeast of Sachigo lake, Patricia district, Ont. (Not Little Sachigo.)

**Opuntia**; lake, southeast of Tramping lake, Sask.

**Orange**; creek, tributary to Black river, international boundary, Yukon.

**Orchard**; point, opposite Atherley, at northern end of lake Simcoe, Simcoe county, Ont.

**Orchay**; river, tributary to Pelly river, west of Ross river, Yukon.

**Ord**; lake, southwest of McIntyre bay, L. Seul, Kenora district, Ont. (Not Long.)

*Orient.* See Pijitawabik.

**Orignal**; bay and cape, Rimouski county, Que. (Not Arignole.)

**Orignaux** (pointe aux); point, St. Lawrence river, Kamouraska county, Que.

**Orleans**; post office, Gloucester Tp., Carleton Co., Ont. (Not St. Joseph d'Orleans.)

**Orme** (anse à l'); (cap à l'); (rivière à l'); bay, cape and river, Jacques-Cartier county, Que. (Not Tortue river.)

**Oromocto**; island, lake, river and village, Sunbury and York Cos., N.B. (Not Oronocto.)

**Ormonde**; creek and lake, discharging into the north side of Fraser lake, Coast district, B.C. (Not Canyon.)

*Oronocto.* See Oromocto.

**Ortell**; mount, in Tasin mountains, Yukon.

**Osborn**; bay, west side of Stuart channel, Vancouver island, B.C.

**Osborn**; cove, in upper portion of Prince Rupert harbour, Coast district, B.C.

**Osbourne**; bay, Eagle lake, Kenora district, Ont. (Not Osbourne's)

**Osgoode**; mount, between forks of Macmillan river, Yukon.

*Osier.* See Hosier.

**Osilinka**; river, flowing easterly into Omineca river, Cassiar district, B.C. (Not Oosilinka, Oslinca nor Ozalinca.)

**Osipasinni**; lake, east of Kakagi lake, Kenora district, Ont. (Not Boulder.)

**Osisko**; lake, southeast of Abitibi lake, Timiskaming county, Que.

**Oskelaneo**; lake, at headwaters of St. Maurice river, Champlain county, Que.

**Osnabruck**; township, and Osnabruck Centre, village, Stormont county, Ont. (Not Oznabruck.)

**Osoyoos**; lake, on international boundary, Similkameen district, B.C. (Not Osooyos.)

**Ospika**; river, tributary to Finlay river, Cassiar district, B.C. (Not Ospica nor Spica.)

**Ospwagan**; lake, north of Paint lake, Manitoba. (Not Pipe nor Pipestone.)

**Ostrander**; point, Marysburg South township, Prince Edward county, Ont. (Not Gravelly.)

**O'Sullivan**; lake, at headwaters of Ottawa river, Montcalm county, Que.

**O'Sullivan**; river, flowing through Puskitamika lake into Waswanipi lake, Abitibi territory, Que.

**O'Sullivan**; settlement, York county, Ont. (Not O'Sullivan's Corners.)

**Otakus**; lake, north of Berry lake, Kenora district, Ont. (Not Otakoose.)

**Otanabi**; lake, northwest of Grand lake Victoria, Timiskaming county, Que.

**Otauwau**; river, tributary to Lesser Slave river, Alberta. (Not O-Tow-Wow.)

**Otchisk**; river, tributary to Waswanipi river, Abitibi territory, Que.

*Otelloch.* See Odellach.

**Otoskwin**; lake and river, upper Winisk river, Patricia district, Ont.

*O-Tow-Wow.* See Otauwau.

**Ottawa**; city, Carleton county, Ont.

**Ottawa**; creek, tributary to Dominion creek, Yukon.

**Ottawa**; lake, in Joliette county, Que.

**Ottawa**; river, which in lower portion forms the boundary between Ont. and Que.

**Otter**; point, west of Sooke bay, Vancouver island, B.C.

*Otter.* See Big Otter.

*Otter.* See Fantail.

**Otterhead**; river, tributary to Kicking Horse river, Kootenay district, B.C.

**Ottertail**; falls, in Ottertail river, above Goodsir creek, Yoho park, Rocky mountains, Kootenay district, B.C.

**Ottertail**; river, mountain range and railway station, Kootenay district, B.C.

**Otty**; island, Navy group, St. Lawrence river, Leeds county, Ont.

*Ouasiemska.* See Washimeska.

*Oulac.* See Aulac.

*Outer.* See Henry.

*Outer Bay of Long Pt.* See Long Point.

**Outer Duck**; island, east of Great Duck island, the most southern of the Duck islands, Manitoulin district, Ont.

*Outer island of Port Hood.* See Henry.

*Outer Sturgeon.* See McCreary.

*Oval.* See Kawawia.

**Overflow**; lake, on Olga river, north shore of Hudson strait, N.W.T.

**Overflowing**; river, emptying into the northwest end of lake Winnipegosis, Man.

**Owen**; bay, north shore of Okisollo channel, Coast district, B.C.

**Owen**; channel and island, between Manitoulin and Fitzwilliam islands, Manitoulin district, Ont.

**Owen**; island, Navy group, St. Lawrence river, Leeds county, Ont.

**Owen**; mount, south of Cathedral mountain, Kootenay district, B.C.

**Owen**; point, between Athol and Wellington bays, Prince Edward Co., Ont. (Not West.)

**Owl**; river, flowing from Heart lake to lac La Biche, central Alberta.

**Ox**; point, the western extremity of point Anne, Thurlow township, Hastings Co., Ont.

**Oxdrift**; railway station, Kenora district, Ont.

*Oxstall.* See Ecstall.

**Oxtongue**; lake and river, Haliburton county, Ont. (Not Ox Tongue.)

*Oyster.* See Ladysmith.

**Oyster**; peak, west of mount Douglas, Rocky mountains, Alberta.

*Ozalinca.* See Osilinka.

**Ozhiski**; lake, southwest of Attawapiskat lake, Patricia district, Ont.

**Ozhuskans**; rapids, upper Winisk river, Patricia district, Ont.

*Oznabruck.* See Osnabruck.

## P

**Pabelognang**; lake and river, tributary to Vermilion river, Champlain county, Que.

**Pachena**; point, south of Pachena bay, west coast of Vancouver island, B.C. (Not Beegadoss nor Beeghadoss.)

*Pachewanow.* See Opachuanau.

*Packhoon.* See Pakhoan.

**Paddle**; river, tributary to Pembina river, Alberta.

*Paddle.* See Boyer.

**Paddling**; lake, north of Blaine lake, central Saskatchewan.

*Pagaonga.* See Papaonga.

**Pagato**; lake and river, tributary to Churchill R., east of Reindeer R., central Sask.

**Page**; lagoon, south of Hammond bay, southeast coast of Vancouver island, B.C.

**Page**; point, Ladysmith harbour, east coast of Vancouver island, B.C.

**Paget**; peak, northwest of Hector station, Rocky mountains, Kootenay district, B.C.

**Pagwachuan**; lake, and river tributary to Kenogami river, Algoma and Thunder Bay districts, Ont. (Not Bagutchuan river, Pawgutchewan river, Powgulchuan lake, nor Pawghtchewan lake.)

**Paincourt**; village, Kent county, Ont. (Not Dover South nor Pain Cour.)

*Painkiller.* See Gamskagamik.

**Painsec**; village, Westmorland Co., N.B. (Not Painsec Junction.)

**Paint**; lake and river, tributary to Grass river, Manitoba. (Not Manuminan.)

**Paisley**; point, Douglas channel, west of Maitland island, Coast district, B.C.

**Pakhoan**; lake, on Severn river, Patricia district, Ont. (Not Little Cedar nor Packhoon.)

*Pakitanika.* See Blouin.

*Pak-oghkee.* See Pakowki.

**Pakonsigane**; river, upper waters of Manuan river, St. Maurice county, Que.

*Pakowagaming.* See Pakowkami.

*Pakowcaming.* See Pakowkami.

**Pakowkami**; lake, in Gladstone township, Algoma district, Ont. (Not Pakowagaming nor Pakowcaming.)

**Pakowki**; lake, southeastern Alberta. (Not Pakokee, Pak-oghkee nor Peekopee.)

**Pakwa**; lake, on Grass river, Manitoba. (Not Pakwahigan, Paquehigan nor Sandy.)

*Pakwahigan.* See Pakwa.

**Pakwash**; lakes, northwest of lac Seul, Patricia district, Ont. (Not Little Shallow, Paquash nor Shallow.)

**Palisade**; mountain, northwest of Sir Sandford range, Selkirk mountains, B.C.

**Palliser**; mountain range, pass and river, Rocky mountains, Kootenay district, B.C.

**Palmer**; mount, eastern termination of Sir Sandford range, creek tributary to Gold river, also glaciers in the Selkirk mountains, Kootenay district, B.C. (Not Novelist creek and mountain, nor west branch of Gold river.)

**Palmer Bar**; creek, tributary to Moyie river, Kootenay district, B.C.

**Pantage**; lake, on telegraph trail, south of Blackwater river, Cariboo district. B.C. (Not Pelican.)

**Panther**; river, flowing northeasterly into Red Deer river, Rocky mountains, Alta.

**Papaonga**; river, tributary to Wenasaga river, above Slate lake, Patricia district, Ont. (Not Papagonga.)

**Papineau**; brook and lake, Wicklow township, Hastings county, Ont.

**Papineau**; lake, Labelle county, Que. (Not Lac du Commandant.)

**Papineau d'Abbotsford**; village, Rouville county, Que.

*Paquash.* See Pakwash.

*Paquehigan.* See Pakwa.

**Paquin**; lake, northwest of Crean lake, central Saskatchewan. (Not Cross.)

**Paradise**; mountain peak, south of Sloko river, Cassiar district, B.C.

**Paradise**; valley, north of mount Temple, Alberta.

*Paradise.* See Lodestone.

*Parisian.* See Parisienne.

**Parisienne** (île); island, Whitefish bay, L. Superior, Ont. (Not Parisian island.)

**Parizeau**; point, on east coast of Digby I., Prince Rupert harbour, Coast dist, B.C.

**Park**; mount, west of mount Biddle, Rocky mountains, Kootenay district, B.C.

**Parker**; creek, tributary to Klondike river, Yukon.

**Parker**; island and landing, south of Shute point, Bruce county, Ont.

**Parkhill**; village, Middlesex county, Ont. (Not Park Hill.)

**Parkins**; cape, at west entrance to Quatsino sound, Vancouver island, B.C.

**Parks**; lake, southeast of lake Nipigon, Thunder Bay district, Ont.

**Parrott**; point, Ernestown township, Lennox county, Ont. (Not Nicholson.)

**Parrsboro**; parish, river, and town, Cumberland county, N.S. (Not Parrsborough.)

**Parry**; bay, southwest of Esquimalt, Vancouver island, B.C.

**Parrywood**; railway station, Kenora district, Ont.

**Parson**; rock, Active pass, strait of Georgia, New Westminster district, B.C.

*Partipique.* See Portapique.

**Parton**; river, tributary to Tatshenshini river, Cassiar district, B.C.

**Partridge**; creek, flowing into Wheaton river, also pass, southern Yukon.

**Partridge**; falls, Pigeon R., near Grand portage, Int. boundary, Thunder Bay dist., O.

*Partridge Crop.* See Pineimuta.

**Pas**; town, Saskatchewan river, Man. (Not Le Pas nor The Pas.) Previous decision revised.

**Pasayten**; river, tributary to Similkameen river, Similkameen and Yale districts, B.C. (Not Pasayton.)

**Pashashibu**; bay, Saguenay county, Que. (Not Pashasheeboo.)

**Pashkokogan**; lake and river, southeast of L. St. Joseph, Thunder Bay district, Ont.

**Pasiminikana**; lake, at headwaters of St. Maurice river, Champlain county, Que.

**Paskagama**; lake, upper waters of Migiskan river, Pontiac county, Que.

*Paskekegan.* See Piskahegan.

**Pasquia**; range of hills, also river tributary to the Saskatchewan, Manitoba and Sask. (Not Basquia nor Basquian.)

*Pass.* See Blakiston.

*Patauguin.* See Petauguin.

**Patience**; lake, Tp. 36, R. 3, W. of 3 M., southern Saskatchewan.

**Patterson**; bay and point, St. Lawrence river, Yonge township, Leeds county, Ont. (Not Chimney Island point.)

**Paudash**; brook, lake and post office, Cardiff township, Haliburton county, Ont.

**Paugh**; lake, Sherwood township, Renfrew county, Ont.

**Pauktorvik**; island, southwest shore of Ungava bay, N.W.T.

**Paul**; creek and lake, tributary to N. Thompson river, north of Kamloops, Kamloops district, B.C. (Not Reservation.)

**Paul**; mount, near southeast end of Maligne lake, Rocky Mts., western Alberta.

*Pawghtchewan.* See Pagwachuan.

*Pawgutchewan.* See Pagwachuan.

**Payne**; lake, and river emptying into Ungava bay, New Quebec. (Not Tasurak.)

*Payoonan.* See Peonan.

**Peace**; hills, west of Wetaskiwin, central Alberta.

**Peace**; large river, Peace River district, B.C., and northern Alberta.

**Peach**; island, at outlet of lake St. Clair, Essex county, Ont. (Not Isle au c Pêches.)

**Peak**; lake, southwest of Dinorwic lake, Kenora district, Ont.

*Pear.* See Dromedary.

**Pearce**; mount, northwest of Mt. McNicoll, Selkirk Mts., Kootenay district, B.C.

**Pearl**; island, with lightstation thereon, outside of the entrance to Mahone bay, Lunenburg county, N.S. To avoid duplication of "Green island lightstation," Richmond county. Pearl—name of lightkeepers since 1873.

**Pearson**; island, west of Bélanger point and east of Greene island, Manitoulin district, Ont. (Not Little Grant.)

**Pearson**; ridge, between Pearson ponds and Tyaughton creek, Lillooet district, B.C.

*Pearson's.* See Ferguson.

*Peashteebee.* See Piashti.

**Peavine**; creek, tributary to Moyie river, Kootenay district, B.C.

*Pebble.* See Lowes.

**Peck**: lake, south of Ministikwan lake, central Saskatchewan. (Not Little Fishing.)

*Peckagomique.* See Becaguimec.

**Pedder**; bay and inlet, south of Parry bay, Vancouver island, B.C.

**Peechee**; mount, south of Mt. Girouard, Rocky mountains, Alberta.

*Peekopee.* See Pakowki.

**Peel**; island, northeast of Grenadier island, St. Lawrence river, Leeds county, Ont. (Not Prince Edward nor Tent.)

**Peel**; shoal, off Peel island, northeast of Grenadier island, St. Lawrence river, Leeds county, Ont. (Not Tent Island shoal.)

*Pee-pee-ke-wah-be-kung.* See Pipikwabi.

**Peerless**; lake, Tps. 87 and 88, Rges. 4 and 5, W. 5th M., Alberta. (Not Trout.)

*Peeshabo.* See Pishabo.

**Pegamasai**; lake, in Montgomery township, Algoma district, Ont. (Not Pegamasay.)

**Peggy Cove**; village, Halifax county, N.S. (Not Peggy's Cove.)

*Pe-kange-kum.* See Pikangikum.

*Pekangikum.* See Pikangikum.

**Pekisko**; creek, tributary to Highwood R., Alta. (Not Middle Branch of Highwood R.)

**Pelee**; island and point, and Pelee Island post office, Essex county, Ont. (Not Pele nor Pointe Pelee.)

**Pelerin**; settlement, Kent county, N.B. (Not Pelering nor Puellering.)

**Pèlerins** (Les); islands, St. Lawrence river, Kamouraska county, Que. English usage: Pilgrim islands.

**Pelican**; lake, north of Minnitaki lake, Kenora district, Ont.

*Pelican.* See Chitek.

*Pelican.* See Lavallée.

*Pelican.* See Pantage.

*Pelican.* See Primeau.

**Pelletier**; lake, Rouyn township, also creek flowing from the lake to Kekeko lake, Timiskaming county, Que. (Not Lorenzo.)

**Pelly**; mountains, lakes and river, Yukon.

**Pemberton**; meadows, on Lillooet river, above Lillooet lake, also pass, portage and post office, betweeen Anderson and Lillooet lakes, B.C.

**Pembina**; mountain and river, southern Manitoba.

**Pembina**; river, tributary to Athabaska river, central Alberta.

*Pembina.* See Christina.

*Pembroke.* See Allumette.

**Pemichangan**; lake, Ottawa county, Que. (Not Mushonga, Pemichangau, Pemichangaw nor Penichangan.)

**Pemonka**; river, tributary to Ashuapmuchuan river, Lake St. John county, Que. (Not Plumorgaune nor Pmonka.)

**Pen**; lake, Nightingale township, Haliburton county, Ont.

**Penassi**; lake and river, west of Manitou lake, Kenora district, Ont.

**Pencil**; lake, Cavendish township, Peterborough county, Ont.

**Pender**; island, in southern portion of the strait of Georgia, B.C.

*Pender.* See Brabant.

*Pender.* See Walkem.

**Pend-d'Oreille**; river, flowing into Columbia river, near the international boundary, Kootenay district, B.C.

**Penetangore**; river, emptying into lake Huron at Kincardine, Bruce county, Ont.

**Penetanguishene**; town, Simcoe county, Ont. (Not Penetang.)

*Penichangan.* See Pemichangan.

**Penitentiary**; shoal, southwest of Kingston, Frontenac Co., Ont. (Not Prince Regent.)

*Penny.* See Cumberland.

**Penrose**; mount; in forks of Bridge river, Lillooet district, B.C.

**Pentamerus**; point, Crane bay, lake Manitoba, Man.

**Pentecôte**; river, Saguenay county, Que. (Not Pentecost.)

**Peonan**; creek, tributary to Saskatchewan river, near Fort à-la-Corne, Sask.

**Peonan**; point, in northern part of lake Manitoba, Man. (Not Payoonan.)

*Pepechekau.* See Pipishikau.

**Pepin**; point, east entrance to Tuck narrows, Prince Rupert harbour, Coast dist., B.C.

*Pepisquew.* See Weibikwei.

*Pequaket.* See Pikwaket.

*Perault.* See Perrault.

**Perch**; island, northeast of Gordon I., St. Lawrence R., Leeds Co., Ont. (Not Reed.)

**Percy**; lake, Harburn township, Haliburton county, Ont.

*Pereault.* See Perrault.

**Pereleshin**; mountain, near Stikine R., between Anuk and Scud Rs., Cassiar dist., B.C.

**Peribonka**; river, emptying into lake St. John, Que. (Not Peribonca.)

**Perkins**; creek and peak, north of Pugh peak, southern Yukon.

**Perkins**; rock S.W. of Ruel shoal, entrance to Key harbour, Parry Sound dist., Ont.

**Perley rock**; mountain spur, near Terminal peak, Selkirk Mts., Kootenay district, B.C.

*Perpisawick.* See Petpeswick.

**Perrang**; cove, east shore of St. Margaret bay, Halifax county, N.S. (Not Perrin.)

**Perrault**; lake, west of McIntyre bay, L. Seul, Kenora district, Ont. (Not Perault nor Pereault.)

*Perrin.* See Perrang.

**Perry**; creek, tributary to St. Mary river, Kootenay district, B.C.

**Perry**; ridge, west of Slocan river, Kootenay district, B.C. (Not Perry's.)

**Perseverance**; island, west of Fitzwilliam island, Manitoulin district, Ont.

**Persil (port au)**; bay, Charlevoix county, Que.

*Perther's.* See Perthes.

**Perthes**; point, in northern portion of Tagish lake, Yukon. (Not Perther's.)

*Petatstekupau.* See Petitsikapau.

**Petauguin**; lake, in Galbraith township, Algoma district, Ont. (Not Patauguin.)

**Petawawa**; military reserve, railway station, river, township and village, Renfrew county, Ont. (Not Petewawa.)

*Petcoudiac.* See Petitcodiac.

**Peter**; rock, off the north shore of lake Ontario, between Cobourg and Port Hope, Northumberland county, Ont. (Not Gale island nor Gull rock.)

*Peter's.* See Petrie.

**Peterson**; lake, southeast of Cobalt, Timiskaming district, Ont.

**Peterson**; range of mountains, northwest of lake Laberge, Yukon.

**Peters Road**; village, Kings county, P.E.I. (Not Peter's Road.)

*Petewawa.* See Petawawa.

**Pethick**; point, on east side of Prince Rupert harbour, Coast district, B.C.

**Pethinue**; peninsula, Great Slave lake, N.W.T. (Not Peth-the-nu-eh.)

*Petishikupau.* See Petitsikapau.

*Petit Chicot.* See Chicot.

**Petitcodiac**; river, Albert and Westmorland counties, N.B. (Not Petcoudiac nor Petit Coudiac.)

**Petitdegrat**; inlet, island and hamlet, Richmond county, N.S. (Not Petit Degrat nor Petit de Grat.)

*Petite.* See Walton.

*Petite Ile aux Cygnes.* See Sévigny.

**Petite-Nation**; river, tributary to the Ottawa, from the north. (Not Nation nor North Nation.)

*Petite Nation.* See South Nation.

**Petit-Rocher**; post village and railway station, Gloucester county, N.B. (Not Petite Roche nor Petite Rocher.)

**Petitsikapau**; lake, north of Ashuanipi river, New Quebec. (Not Petatstekupau. Petishikupau nor Petshikupau.)

**Petpeswick**; harbour, inlet, lake, and post office, Halifax county, N.S. (Not Perpisawick nor Petpiswick.)

**Petrie**; reef, at east entrance to Sydney harbour, Cape Breton county, N.S. (Not Peter's, Petre nor Petrie's.)

**Petrolia**; town, Lambton county, Ont. (Not Petrolea.)

*Petshikupau.* See Petitsikapau.

**Peveril**; mountain peaks, southwest of Goodwin creek, Cassiar district, B.C.

**Peyto**; glacier and lake, northwest of Bow lake, Alta. (Not Peyto's nor Glacier lake.)

**Pheasant**; creek and hill, north of Qu'Appelle river, southeastern Saskatchewan.

**Phelan**; railway station, north shore of Skeena river, Coast district, B.C.

**Philip**; river, emptying into Northumberland strait, N.S. (Not Phillip.)

**Philips**; cove, east of Pillsbury cove, Prince Rupert harbour, Coast district, B.C.

**Philips**; point, east coast of Digby I., Prince Rupert harbour, Coast district, B.C.

*Phillip.* See Philip.

**Phillipps**; creek, flowing southwesterly across the international boundary, east of Gateway, Kootenay district, B.C. (Not Phillips.)

**Phillips**; shoal, northeast of Main island, entrance to Key harbour, Georgian bay, Parry Sound district, Ont.

**Philmonro**; settlement, Kings county, N.B. (Not Philmaro nor Philomaro.)

**Phœbe**; point, northwestern point of Fitzwilliam island, Manitoulin district, Ont.

**Photograph**; mountain, Kitimat arm, Coast district, B.C.

**Piapot**; creek, flowing into Crane lake, southwestern Saskatchewan.

**Piashti**; bay and river, Saguenay county, Que. (Not Peashte-bai, Piastre bay nor Peashteebee river.)

*Piastre.* See Piashti.

**Piché**; lake, Dubuisson and Fournière townships, Timiskaming county, Que. (Not High Water nor Kamoukakwiti.)

**Pichenninnis**; brook, flowing into Butler lake, Kenora district, Ont.

**Pichinamei**; lake, south of Attawapiskat lake, Patricia district, Ont.

*Pickering.* See Frenchman.

*Pickitigouching.* See Pikitigushi.

**Pickle**; lake, east of Kapkichi lake, upper Winisk river, Patricia district, Ont.

*Pickwaket.* See Pikwaket.

*Picnic.* See Cockburn.

*Picnic.* See Stovin.

**Picture Narrows**; lake, west of Manitou lake, Kenora district, Ont.

**Piegan**; creek, flowing into Sevenpersons coulée, southeastern Alberta.

**Pieromonta**; river, emptying into Kempt lake, St. Maurice county, Que.

**Pierre** (rivière à); river, tributary to Batiscan river, Portneuf county, Que. See also Rivière-à-Pierre.

**Piers**; island, Satellite channel, southeast coast of Vancouver I., B.C. (Not Pier.)

**Pigeon**; bay, falls and point, also river flowing into the bay and forming part of the international boundary, Thunder Bay district, Ont.

**Pigeon**; mountain, south of Bow river, Rocky Mountains park, Alberta.

*Pijitawabekong.* See Pijitawabik.

**Pijitawabik**; bay, lake Nipigon, Thunder Bay district, Ont. (Not Orient, Pijitawabekong, Pijitawbikong nor Pittiwabikong.)

*Pijitawabikong.* See Pijitawabik.

**Pijuwyan**; lake, and river tributary to Waswanipi river, Abitibi territory, Que.

**Pika**; peak, northeast of Lake Louise railway station, Rocky mountains, Alberta.

**Pikangikum**; Indian reserve and lake, on Berens river, Patricia district, Ont. (Not Pe-kange-kum nor Pekangikum.)

**Pikapao**; river, tributary to Moisie river, Saguenay county, Que. (Not Pikopao.)

**Pikauba**; lake, at headwaters of Chicoutimi river, Charlevoix county, Que. (Not Upikauba.)

**Pike**; lake, mountain and river, south of Atlin lake, Cassiar district, B.C.

**Pikitigushi**; river, emptying into the northern end of Nipigon lake, Thunder Bay district, Ont. (Not Pickitigouching nor Muddy.)

*Pikopao.* See Pikapao.

**Pikwaket**; brook and mountain, Kings county, N.B. (Not Pequaket nor Pickwaket.)

**Pilgrim**; islands ('The Pilgrims'), also shoal, St. Lawrence river, Kamouraska county, Que. French usage: Les Pèlerins.

**Pilkington**; mount, north of Blaeberry river, Rocky Mts., Kootenay district, B.C.

**Pillsbury**; cove, east of Venn passage, Prince Rupert harbour, Coast district, B.C.

**Pilot**; bay, Gabriola island, southeast coast of Vancouver island, B.C.

**Pilot**; bay and point, and Pilot Bay settlement, Kootenay lake, Kootenay district, B.C. (Not Cape Horn nor Pirate bay.)

**Pilot**; island, northeast of Grenadier island, St. Lawrence river, Leeds county, Ont.

**Pilot**; lake, Burleigh township, Peterborough county, Ont.

**Pilot**; point, southeast corner of Gribbell island, Coast district, B.C.

**Pimbury**; point, Departure bay, Vancouver island, B.C. (Not Pinbury.) Previous decision revised.

*Pinbury.* See Pimbury.

**Pinched-neck**; lake, at headwaters of Rupert river, north of Mistassini lake, Mistassini territory, Que.

**Pine**; island, near Key harbour, Georgian bay, Parry Sound district, Ont.

**Pine**; lake, northwest of Gunflint lake, international boundary, Thunder Bay district, Ont. (Not Island Portage lake.)

**Pine**; point, Weller bay, Ameliasburg township, Prince Edward county, Ont.

*Pine.* See Clark.

*Pine.* See Mermaid.

*Pine.* See Minago.

*Pine.* See Shingwak.

*Pine channel.* See Kapikik lake.

**Pineimuta**; lake, west of L. St. Martin, Manitoba. (Not Partridge Crop.)

*Pine Island.* See Cumberland.

**Pineroot**; river, emptying into Athapapuskow lake, Manitoba.

**Pine Tree**; harbour and point, southeast of Johnston harbour, Bruce county, Ont.

*Pine Wood.* See Frederick.

**Pingston**; creek, west of Upper Arrow lake, Kootenay district, B.C.

**Pink**; river, flowing northeasterly into Reindeer lake, Sask. (Not Vermilion.)

**Pinnacle**; mountain, southwest of mount Temple, Alberta.

*Pinnacle.* See Cathedral.

**Pintendre**; parish, Lévis county, Que.

**Pinto**; butte, also creek tributary to Wood river, Sask. (Not Pinto Horse.)

**Pipe** (rivière à la); river, flowing into L. St. John, Taillon township, Lake St. John county, Que.

*Pipe.* See Ospwagan.

**Pipestone**; lake, south of Cross lake, Nelson river, Manitoba.

**Pipestone**; pass and river, Rocky mountains, Alberta. (Not Pipe creek.)

*Pipestone.* See Ospwagan.

**Pipikwabi**; lake, Stanhope Tp., Haliburton Co., Ont. (Not Pee-pee-ke-wah-be-kung.)

**Pipishikau**; river, Saguenay county, Que. (Not Pepechekau.)

**Pipmakan**; lake, Chicoutimi county, Que. (Not Pipmaukin nor Pitmuakan.)

*Pirate.* See Pilot.

*Pisarinco.* See Lorneville.

**Pishabo**; lake, Cassels township, Nipissing district, Ont. (Not Peeshabo.)

**Pishidgi**; lake, west of lake Nipigon, Thunder Bay district, Ont.

**Piskahegan**; river, tributary to Magaguadavic river, Charlotte county, N.B. (Not Paskekegan nor Piskehagan.)

**Pita**; lake, on Churchill river, below Reindeer river, Saskatchewan.

**Pitchpine**; island, Admiralty group, St. Lawrence river, Leeds county, Ont.

*Pitmuakan.* See Pipmakan.

**Pitopiko**; lake, an expansion of Manuan river, upper St. Maurice river, Champlain county, Que. (Not Pitopieco.)

**Pitt**; creek, tributary to St. Mary river, Kootenay district, B.C.

*Pittiwabikong.* See Pijitawabik.

**Pitts**; mount, southwest of the confluence of Lewes and Pelly rivers, Yukon.

**Pizustigwan**; river, northwest of Attawapiskat lake, Patricia district, Ont.

*Plamorganne.* See Pemonka.

*Plaster Cove* (point). See Balache.

**Plateau**; creek, flowing into Torres channel, Atlin lake, Cassiar district, B.C.

**Pleasant**; point, the eastern extreme of Prince Edward county, Ont. (Not Indian.)

**Plover**; island, west coast of Ungava bay, N.W.T.

**Plum**; creek and lake, tributary to Souris river, southwestern Manitoba.

**Plumbob**; creek, tributary to Kootenay river, Kootenay district, B.C.

**Plumper**; passage, channel between Discovery and Chain islands, Haro strait, New Westminster district, B.C. (Not Discovery.)

*Plumper's.* See Active.

*Pmonka.* See Pemonka.

**Poboktan**; creek, flowing northwesterly into Sunwapta river, also pass at head of the creek, Alberta.

*Pockmouche.* See Pokemouche.

*Pocmouche.* See Pokemouche.

*Pocowagamis.* See Pokowagamis.

**Pohenagamuk**; lake and village, Pohenegamook township, Kamouraska county, Que. (Not Pohenagamooke nor Pohenegamook.)

**Point**; river, flowing into Sagemace bay, lake Winnipegosis, Manitoba.

*Point Brûlé.* See Brûlé.

*Point de Bute.* See Pont-à-Buot.

**Pointe-à-la-Garde**; village, Bonaventure county, Que. (Not Pointe la Garde.) Reversal of previous decision.

**Pointe-au-Pic**; village, Charlevoix county, Que.

**Pointe-des-Monts**; hamlet, Saguenay county, Que. (Not Pointe de Monts.) See also Monts.

**Point Edward**; town, Lambton county, Ont.

**Point Fortune**; village, Vaudreuil county, Que.

**Pointe-Gatineau**; village, at the mouth of Gatineau river, Ottawa county, Que. (Not Gatineau Point.)

*Pointe Pelee.* See Pelee.

**Pointe-Platon**; settlement, Lotbinière county, Que. (Not Point Platon.)

*Point-no-point.* See Glacier.

**Point Sapin**; post village, Kent county, N.B.

**Point Wolf**; town, Albert county, N.B. (Not Point Wolfe.)

**Pokemouche**; river, Gloucester county, N.B. (Not Pockmouche nor Pocmouche.)

**Poker**; creek, branch of Walker creek, near international boundary, Yukon.

**Pokesudi**; island, at west entrance to Shippigan harbour, Gloucester county, N.B. (Not Poc Sudie, Poksudi, Pokesudie, Pokesuedie, nor Pokesoudie.)

**Pokiok**; river and village, York county, N.B. (Not Pokiock nor Poquiock.)

*Pokkattawagan.* See Pukkatawagan.

**Pokowagamis**; lake, and river tributary to Eel river, York county, N.B. (Not Pocowagamis nor Pocowogamis.)

**Pollinger**; mount, northeast of Kiwetinok peak, Rocky Mts., Kootenay district, B.C.

**Ponass**; lake, Tp. 38, R. 14, W. 2 M., Saskatchewan.

**Ponhook**; lake, in western portions of Halifax and Hants Cos., N.S. (Not St. Croix.)

**Pont-à-Buot**; village, Westmorland Co., N.B. (Not Point de Bute nor Pointe de Bute.)

**Pontax**; river, emptying into James bay, north of Rupert river, Mistassini territory, Que. (Not Pontiac.)

**Pontbriand**; parish and village, Megantic county, Que.

*Pontiac.* See Pontax..

**Pontleroy**; lake, Pontleroy township, Timiskaming county, Que. (Not Eel.)

**Pooh-bah**; lake, Hunter island, Rainy River district, Ont. (Not Pooh-Bah.)

*Pool.* See Poole.

**Poole**; creek, tributary to Birkenhead river, Lillooet district, B.C. (Not Pool.)

**Poole**; island, N. of Grenadier I., St. Lawrence R., Leeds Co., Ont. (Not Pool.)

**Pooles Resort**; summer resort, Leeds county, Ont. (Not Poole's Resort.)

**Popes**; peak, Bow range, Rocky Mts., Alta. and Kootenay dist., B.C. (Not Pope's.)

**Popham**; island, Navy group, St. Lawrence river, Leeds county, Ont.

**Poplar**; creek, flowing easterly into Lardeau river, at Poplar, Kootenay district, B.C.

**Poplar**; point, near the mouth of Rupert river, Mistassini territory, Que.

**Poplar Point**; parish and village on Assiniboine river, Man.

*Poquiock.* See Pokiok.

**Porcupine**; creek, tributary to Stikine R., south of Anuk R., Cassiar dist., B.C.

**Porcupine**; hills, southern Alberta.

**Porcupine**; mountain, Manitoba and Saskatchewan.

**Porcupine**; point and reef, southeast of cape Hurd, Bruce county, Ont.

**Porcupine**; river, tributary to Yukon river, northwestern Yukon.

**Porlier**; pass, between Galiano and Valdes islands, strait of Georgia, New Westminster district, B.C. (Not Portier.)

**Porphyry**; creek, flowing to Bulkley river, Cassiar district, B.C.

**Porphyry**; island, point and reef, south of Edward island, Thunder Bay district, Ont.

**Porpoise**; channel, between Lelu and Ridley islands, also harbour in south side of Kaien island, Coast district, B.C.

**Portage**; bay, east of Peonan point, in northern portion of L. Manitoba, Man.

**Portage**; bay and point, east of Gataere point, Manitoulin I., Manitoulin dist., Ont.

**Portage**; lake, west of Knife lake, international boundary, Rainy River district, Ont.

*Portage.* See Whitecap.

**Portage-la-Prairie**; parish and city, on Assiniboine river, Man.

**Portal**; peak, east of mount Baker, Alberta. (Not Mount Portal.)

**Portapique**; river and village, Colchester county, N.S. (Not Partipique nor Port au Pique.)

**Port Arthur**; lakeport city, Thunder Bay district, Ont.

Named Prince Arthur's Landing, in honour of H. R. H. Prince Arthur (Duke of Connaught), by Col. Wolseley, on the occasion of the landing of the troops of the Red River Expedition there, May 25th 1870. Incorporated as the town of Port Arthur, by statute of Ontario, March 25th, 1884.

**Port-au-Persil**; post village, Charlevoix county, Que. (Not Port Au Persil.)

**Port-au-Saumon**; post village, Charlevoix county, Que. (Not Port Salmon.)

**Port Bickerton**; village, Guysborough county, N.S. (Not Port Beckerton.)

**Port Burwell**; lightstation and village, Elgin county, Ont. (Not Big Otter Creek lightstation.)

**Port Daniel**; harbour and village, Bonaventure county, Que. (Not Port Daniel East nor St. George Port Daniel.)

*Port Daniel East.* See Port Daniel.

**Port Darlington**; harbour, at Bowmanville, Durham county, Ont.

*Port Ebert.* See Port Hebert.

**Port Elgin**; town, Bruce county, Ont.

**Porter**; creek, tributary to Indian river, Yukon.

**Porter**; lake, between Atlin and Gladys lakes, Cassiar district, B.C.

**Porter**; landing, at N. end of Dease I., Cassiar district, B.C. (Not Porter's landing.)

*Porter's Landing.* See Porter.

*Port Essington.* See Essington.

**Port Hebert**; village, Shelburne county, N.S. (Not Port Ebert, Big Port le Bear, Big Port l'Hebert nor Port L'Hebert.)

**Port Hood**; harbour and seaport town, Inverness county, N.S.

**Port Hood**; island, opposite Port Hood, Inverness county, N.S. (Not Smith's.)

**Port Hood Island**; post office, on Port Hood island, Inverness county, N.S.

*Portier.* See Porlier.

**Port Joli**; village, Queens county, N.S. (Not Port Jolie.)

**Portland**; island, west of Moresby island, southeast coast of Vancouver Island, B.C.

**Port Latour**; village, Shelburne county, N.S. (Not Port la Tour nor Port Letour.)

**Port Lewis**; post office, Huntingdon county, Que. (Not Port Louis.)

*Port L'Hebert.* See Port Hebert.

**Port Lorne**; post office and lighthouse station, Annapolis county, N.S. (Not Marshall Cove nor Port Williams.)

*Port Louis.* See Port Lewis.

**Port Maitland**; lightstation and village, bay of Fundy, Yarmouth county, N.S. (Not Green Cove nor Maitland.)

*Port Matoon.* See Port Mouton.

*Port Medway.* See Medway.

*Port Metway.* See Medway.

**Port Morien**; village, on west side of Morien bay, Cape Breton county, N.S. (Not Cow Bay village nor Morien Bay village.

**Port Mouton**; village, Queens county, N.S. (Not Port Matoon.)

**Portobello**; stream, emptying into French lake, Sunbury county, N.B. (Not Porto Bello nor Portobella.)

*Port Williams.* See Port Lorne.

**Possession**; point, east of Sooke inlet, Vancouver island, B.C

*Pot-à-l'eau-de-vie.* See Brandypot.

**Potato**; lake and river, emptying into south side of lac La Ronge, Sask.

**Pothole**; creek, tributary to St. Mary river, southern Alberta. (Not Pot Hole.)

**Potter**; point, Ameliasburg township, Prince Edward county, Ont.

**Pottersburg**; railway station and village, Middlesex Co., Ont. (Not London Junction.)

**Pouce-Coupé**; river. tributary to Peace river, Alberta. (Not Echafaud.)

**Poulamon**; bay, Richmond county, N.S. (Not Poulament nor Poulamond.)

**Poverty**; lake, Monmouth township, Haliburton county, Ont.

**Povoas**; mountain, east of the north end of lake Laberge, Yukon.

**Power**; lake, east of Anzhekumming lake, Kenora district, Ont.

*Powgulchuan.* See Pagwachuan.

*Powingow.* See Ogani.

**Prairies** (rivière des); river, separating Laval county from Hochelaga and Jacques-Cartier counties, Que. (Not Back river.) See also Rivière-des-Prairies.

**Pratt**; island and reef, southeast of Dead island, at entrance to Key harbour, Georgian bay, Parry Sound district, Ont.

**Prejevalsky**; point, Bennett lake, Yukon. (Not Prejevalski.)

**Presbyterian**; river, tributary to Leather river, eastern Saskatchewan.

*Present.* See Larder.

**President**; range of mountains and pass, west of Yoho valley, Rocky mountains, Kootenay district, B.C. (Not Emerald.) Named after the president of the Canadian Pacific Railway Company. See also The President.

*President.* See Larder.

**Presqu'île**; bay, peninsula and point, near S.E. corner of Northumberland Co., Ont.

**Presquile**; river, tributary to St. John river, Carleton county, N.B. (Not Presqu'ile.)

**Preston**; cove, north shore of Amherst island, Lennox county, Ont. (Not Preston harbour.)

**Prevost**; cañon, also river tributary to Ross river, Yukon.

**Prevost**; island, off the west end of Active pass, strait of Georgia, B.C.

**Prevost**; mount, east of Carboro bay, southeast coast of Vancouver island, B.C.

*Prevost.* See Kunghit.

**Priam**; lake, west of Manitou lake, Kenora district, Ont.

**Price**; township, Frontenac county, Que.

**Prim**; point, at entrance to Annapolis basin, Digby county, N.S. (Not Rogers.)

**Primeau**; lake, an expansion of Churchill river, Sask. (Not Pelican.)

**Primrose**; lake, north of Cold lake, on boundary line, Alberta and Saskatchewan. (Not Goose.)

**Prince Albert**; peninsula, northwesterly portion of Victoria island, N.W.T. (Not Prince Arthur Land.)

Prince Albert land. See Victoria island.

**Prince Alfred**; island, Brock group, St. Lawrence river, Leeds county, Ont.

Prince Arthur land. See Prince Albert.

**Prince Edward**; bay and point, Prince Edward county, Ont. (Not South bay nor South Bay point.)

*Prince Edward.* See Peel.

*Prince Henry Foreland.* See Hopes Advance.

*Prince of Wales.* See Wales.

**Prince of Wales**; island, northwest of Boothia peninsula, N.W.T.

**Prince Patrick**; island, north of Banks island, N.W.T.

**Prince Regent**; island, Lake Fleet group, St. Lawrence river, Leeds county, Ont. (Not Little Stave nor McDonald's.)

*Prince Regent.* See Penitentiary.

**Prince Rupert**; harbour and Trans. Ry. terminus, Kaien island, Coast district, B.C.

**Princess Charlotte**; island, Lake Fleet group, St. Lawrence river, Leeds county, Ont.

**Princetown**; village, Prince county, P.E.I. (Not Prince Town.)

**Prinyer**; cove, Marysburg North township, Prince Edward county, Ont. (Not McDonnel.)

**Pritzler**; harbour, N. shore Hudson strait, N.W.T. (Not Pritzler's nor Jackman sound.)

**Privateer**; mountain, N.E. of Blackwater range of the Rockies, Kootenay dist., B.C.

**Procter**; creek and settlement, south of Balfour, Kootenay dist., B.C. (Not Proctor.)

**Promise**; island, at the entrance to Douglas channel, Coast district, B.C.

**Prophet**; river, flowing northerly into Muskwa river a tributary of Fort Nelson river, Peace River district, B.C.

**Protection**; island, east of Nanaimo harbour, Vancouver island, B.C. (Not Douglas.)

**Protection**; mountain, east of Baker creek, Rocky mountains, Alberta.

**Proud-sitting**; lake, at headwaters of St. Maurice river, Champlain county, Que.

**Providence**; bay and point, south shore of Manitoulin island, Manitoulin district, Ont.

**Providence**; settlement and H. B. Co. post, on Mackenzie river below the outlet of Great Slave lake, N.W.T. (Not Fort Providence.)

**Provoking**; lake, in Algonquin National park, Nipissing district, Ont.

**Pruden**; bay, in south end of lake Winnipeg, Manitoba. (Not Pruden's.)

**Prud'homme**; lake, northeast of Rib lake, Timiskaming district, Ont.

**Psyche**; island, Lake Fleet group, St. Lawrence river, Leeds county, Ont.

**Ptarmigan**; creek, flowing into a large lake of the Pelly group, Yukon.

**Ptarmigan**; lake and peak, northeast of Lake Louise station, Rocky mountains, Alberta.

*Ptarmigan.* See Titkana.

**Puce**; post village, also rivière aux Puces, Essex county, Ont.

**Pudding**; burn, tributary to St. Mary river, Kootenay district, B.C.

*Puellering.* See Pelerin.

**Pugh**; peak, northwest of the big bend of Wheaton river, southern Yukon.

*Puke-lowogein.* See Setting.

**Pukkatawagan**; lake and river, Churchill river, Manitoba. (Not Pokkattawagan. nor Puk-a-ta-wa-gan.)

**Pulpit**; peak, south of Turquoise lake, Rocky mountains, Alberta.

**Pulpwood**; point, southwestern side of Cockburn island, Manitoulin district, Ont.

**Pulsatilla**; mountain, southeast of mount Avens, Rocky mountains, Alberta.

**Pulteney**; point, southwestern extreme of Malcolm island, at entrance to Broughton strait, Coast district, B.C. (Not Graeme.) The lighthouse established in 1905 is on this point.

**Pulton**; bay and point, south shore of Okisollo channel, Coast district, B.C.

**Punichuan**; bay, in the southern end of Mistassini lake, Mistassini territory, Que.

**Punk**; island, 3 miles southeast of Grindstone point, lake Winnipeg, Man. (Not Deer nor Reindeer.)

*Punk.* See Deer.

**Purden**; lake, east of the bend of Bowron river, Cariboo district, B.C. (Not Great Bear.)

**Purity**; glacier and mountain, Selkirk mountains, B.C. (Not Lardo glacier.)

**Purvis**; bank, northwest of Greene island, Manitoulin district, Ont.

**Puskitamika**; lake, south of Waswanipi lake, Abitibi territory, Que.

**Puslinch**; lake, village, and township Wellington county, Ont. (Not Schaw station.)

**Pyramid**; creek, tributary to St. Mary river, Kootenay district, B.C.

**Pyramid**; mountain, north of mount Gray, southern Yukon.

## Q

**Quaco**; bay, head, ledge, and shoal, St. John county, N.B.

*Quaco.* See St. Martins.

*Quadacha.* See Kwadacha.

**Quadra**; hill, Galiano island, strait of Georgia, B.C.

**Quadra**; island, between Discovery passage and Okisollo channel, Coast district, B.C. The southern portion of what was formerly Valdes island.

**Quamichan**; lake and river, tributary to Cowichan river, Vancouver island, B.C.

*Quaneca.* See Kwadacha.

**Qu'Appelle**; lake, an expansion of Qu'Appelle river, Sask., the western in the chain of the "Fishing lakes." (Not Upper Fishing.)

**Qu'Appelle**; river, flowing easterly into the Assiniboine, southern Manitoba and Saskatchewan, also town in southern Saskatchewan.

**Quarry**; point, Manitoulin island, Manitoulin district, Ont.

*Quarry.* See Forsyth.

**Quartet**; lakes, near international boundary, Yale district, B.C.

**Quartz**; creek, branch of McDame creek, Dease river, Cassiar district, B.C.

**Quartz**; creek, tributary to Indian river, Yukon.

*Quatawamkedgewick.* See Kedgwick.

**Quebec**; creek, tributary to Yukon river, below Dawson, Yukon.

**Quebec**; head, eastern end of Wolfe island, Frontenac county, Ont. (Not East point.)

**Queen**; point, forms the western boundary of Walkhouse bay, Manitoulin island, Ont.

**Queen Elizabeth**; foreland, S.E. point of Loks land, N.W.T. (Not North foreland.)

**Queensport**; harbour, Guysborough Co., N.S. (Not Queen's Port nor Crow harbour.)

**Queenston**; village, and Queenston heights, Lincoln county, Ont. (Not Queenstown.)

*Quenotte.* See Cugnet.

**Quesnel**; lake, mining division, river and village, Cariboo district, B.C. (Not Quesnelle.)

**Quetachu**; bay, Saguenay county, Que. (Not Quetachoo.)

**Quiet**; lake, northeast of Teslin lake, Yukon.

**Quill**; lakes, southern Saskatchewan. (Not Big Quill and Little Quill.)

*Quinitsa.* See Kwinitsa.

**Quinn**; creek, branch of Sulphur creek, Indian river, Yukon. (Not Quin.)

**Quinte**; bay of, in L. Ontario, almost separating Prince Edward county from the mainland of Ontario. (Not Quinté.)

**Quinze** (lac des); lake, an expansion of the upper Ottawa river, Timiskaming Co., Que.

**Quio**; river, tributary to the Ottawa, Pontiac county, Que.

*Quio.* See Quyon.

**Quispamsis**; post village, Kings county, N.B. (Not Quispansis.)

*Quoieek.* See Kwoiek.

**Quyon**; village, Pontiac county, Que. (Not Quio.) Reversal of previous decision.

## R

**Rabbit**; mountain, Paipoonge township, Thunder Bay district, Ont.

**Rabbit**; mountain and river, east of lake Evans, Abitibi territory, Que.

**Rabbitt**; mount, also creek, northwest of Tulameen, Yale district, B.C.

**Race**; passage and rocks, off S. point of Vancouver island, B.C. (Not Race islands.)

**Rae**; mount, Misty range, southern Alberta.

**Raft**; narrows, north of Hill island, St. Lawrence river, Leeds county, Ont.

**Ragged**; bight, northeast of cape Hurd, Bruce county, Ont.

*Ragged Island* (harbour). See Lockeport.

**Ragged**; lake, in Algonquin National park, Nipissing district, Ont.

**Ragged**; mountain, east of Sooke river, Vancouver island, B.C. (Not Saddle.)

*Ragged Island.* See Lockeport.

**Rainy**; creek, tributary to Elbow river, Alberta.

**Rainy**; creek, tributary to Moyie river, Kootenay district, B.C.

**Rainy**; lake and river, international boundary, Rainy River district, Ont.

The river takes its name from the lake which appears on early maps as "Tekamammaouen"—written "Tekamaihouenne" by Verendrye 1738, and also as lac la Pluie (probably derived from the Indian name) and not as erroneously supposed from René, "name of its discoverer," nor from reine "meaning Queen of rivers."

**Raisin**; river, Glengarry and Stormont counties, Ont. (Not Black, au Raisin nor aux Raisins.)

**Raley**; point, north of Clio bay, Kitimat arm, Coast district, B.C.

**Ram**; river, flowing northeasterly into Saskatchewan river, Alta.

**Ramsay**; river, emptying into Crooks inlet, north shore of Hudson strait, N.W.T.

**Ramsden**; island, Lake Fleet group, St. Lawrence river, Leeds county, Ont.

**Ranch**; point, Nanoose harbour, east coast of Vancouver island, B.C.

**Randolph**; lake, S. of N. T. Ry. and N.W. of L. Nipigon, Thunder Bay district, Ont.

*Rapid.* See Broadback.

*Rapid.* See Minnedosa.

*Rapid.* See Montreal.

**Rapide-de-Femme**; village, Victoria county, N.B. (Not Rapid de Femme nor Rapide des Femmes.)

**Rapides** (lac des); lake, upper Ottawa R., southeast of Barrière L., Pontiac Co., Que.

*Rapid River.* See Forks.

**Raquette**; river, Vaudreuil county, Que.

*Raspberry.* See Robinson.

**Rat**; lake, between Rose and South lakes, Int. boundary, Thunder Bay district, Ont.

*Rat.* See Alcott.

*Rat.* See Taggart.

**Rathbun**; bay and point, E. of Jenkins Pt., Manitoulin I., Manitoulin district, Ont.

*Rat Portage.* See Manigotagan.

*Rat Portage* (lake). See Manigotagan.

*Rattlesnake.* See Bagot.

**Ravelin**; mountain, northwest of Mt. Sir Sandford, Selkirk mountains, Kootenay district, B.C.

**Raven**; lake and river, McFadden township, Timiskaming district, Ont.

**Raven**; river, tributary to Red Deer river, southern Alberta.

**Rawson**; harbour and island, N. shore of Hudson strait, N.W.T. (Not Harbour island.)

**Raymond**; passage, S. from Seaforth Ch., Coast district, B.C. (Not Hecate channel.)

**Reader**; lake, northwest of Pas, Manitoba. (Not Clear Water nor Reeder.)

**Reception**; lake, Grasett township, Algoma district, Ont. (Not Kaikaquabick.)

**Red**; bay, south of Golden valley, Bruce county, Ont.

**Red**; lake, northwest of L. Seul, Patricia district, Ont. (Not Vermilion.)

*Red.* See McKay.

*Red.* See Mikkwa.

**Redan**; mountain, northwest of Sir Sandford range, Selkirk Mts., Kootenay dist., B.C.

**Redberry**; lake, southwest of Carlton, central Saskatchewan.

**Redburn**; creek and peak, northeast of Moberly, Rocky Mts., Kootenay district, B.C.

**Red Dan**; reef, southeast of Birch point, Manitoulin island, Manitoulin district, Ont.

**Red Deer**; lake and river emptying into lake Winnipegosis, Man.

**Red Deer**; river, also town on the river, southern Alberta.

*Red Deer.* See La Biche.

*Red Deer.* See Waskesiu.

*Red Deer.* See Anerley, Coteau and Stockwell.

**Redding**; creek, tributary to St. Mary river, Kootenay district, B.C.

**Redflag**; mountain, west of Parry bay, Vancouver island, B.C.

**Redhose**; rock and lightstation, west of Beaurivage island, Admiralty group, St. Lawrence river, Leeds county, Ont. (Not 7a.)

**Rednersville**; village, Ameliasburg township, Prince Edward county, Ont.

**Redoubt**; lake and mountain, northeast of Lake Louise railway station, Rocky mountains, Alberta.

**Redstone**; brook and lake, Guilford township, Haliburton county, Ont.

**Redwater**; river, tributary of the North Saskatchewan, Alberta. (Not Red Water.)

**Reed**; lake, northeast of Cormorant lake, Manitoba.

*Reed.* See Perch.

*Reed.* See Reid.

*Reeder.* See Reader.

*Reef.* See Bonnet.

**Reesor**; lake, Whitchurch township, York county, Ont. (Not Middletons.)

**Reeves**; harbour, Big island, Hudson strait, N.W.T.

**Refuge**; cove, east of Shipwreck point, Kings county, P.E.I. (Not Naufrage.)

*Refugee.* See Conran.

*Refugee.* See Stovin.

**Reid**; island, south of Valdes island, southeast coast of Vancouver island, B.C.

**Reid**; mount, between Watson and Wheaton rivers, southern Yukon.

**Reid**; mount, southeast of lake Evans, Abitibi territory, Que.

**Reid**; point, south of Red bay, Bruce county, Ont.

**Reid**; rock, south of George island, Halifax harbour, Halifax Co., N.S. (Not Reed.)

**Reid Mills**; hamlet, Dundas county, Ont. (Not Reid's Mills.)

**Reindeer**; creek, tributary to Yukon river, south of Indian river, Yukon.

**Reindeer**; lake, and river emptying into Churchill river, Manitoba and Sask.

*Reindeer.* See Punk.

**Remic**; rapids, in Ottawa river, about two miles west of Ottawa city. (Not Remicks, Remix nor Remous.)

**Remington**; creek, tributary to Indian river, Yukon.

*Remous.* See Remic.

**Renny**; island, south of Whitney point, St. Lawrence R. Leeds Co., Ont. (Not Bush.)

**Reno**; creek, flowing southwesterly into Duncan river, Kootenay district, B.C.

*Reservation.* See Paul.

**Reserve**; point, Active pass, strait of Georgia, New Westminster district, B.C.

**Resolution**; island, at entrance to Frobisher bay, N.W.T. (Not Tudjakdjuan.)

**Resolution**; settlement and H. B. Co. post, on Great Slave lake, near the mouth of Slave river, N.W.T. (Not Fort Resolution.)

*Resolution.* See Warwick.

*Rest.* See Dufay.

**Restigouche**; county and river, northern New Brunswick. (Not Ristigouche.)

*Restigouche.* See Ristigouche.

**Retreat**; cove, southwest of Galiano island, strait of Georgia, B.C.

**Revelstoke**; mount, railway station and town, Kootenay district, B.C.

**Rex**; peak, Shulaps mountain, Lillooet district, B.C.

**Rexton**; town, Kent county, N.B. (Not Kingston.)

**Riall**; island, Brock group, St. Lawrence R. Leeds Co., Ont. (Not Millar's nor Smith's.)

**Rib**; lake, north of Cassels township, Nipissing district, Ont.

**Ribbon**; river, tributary to Manuan river, upper St. Maurice river, Champlain county, Que. (Not Rivière au Ruban.)

**Ribstone**; creek, tributary to Battle river, eastern Alberta. (Not Nose.)

*Rice.* See Muldrew.

**Rich**; island, Navy group, St. Lawrence river, Leeds county, Ont.

**Richard**; point, Nanoose harbour, east coast of Vancouver island, B.C.

**Richard**; point, north of "The Narrows," L. Manitoba, Man.

**Richards**; mount, southwest of Osborn bay, Stuart channel, Vancouver island, B.C.

**Richardson**; lake, also river, emptying into the Athabaska near its mouth, Alberta.

**Richardson**; mount, northeast of Lake Louise station, Rocky mountains, Alberta.

**Richelieu**; village, on Richelieu river, Rouville county, Que. (Not Village Richelieu.)

**Richmond**; gulf, north of Little Whale river, New Quebec. (Not Richmond lake.)

**Richmond**; village, Carleton county, N.B. (Not Richmond Corner.)

*Richmond.* See Malpeque.

*Richmond.* See New Richmond.

*Richmond Corner.* See Richmond.

**Richthofen**; island and valley, lake Laberge, Yukon. (Not Richtofen.)

**Rickett**; harbour, eastern side of Cockburn island and southwesterly from Cinder point, Manitoulin district, Ont.

**Rickley**; harbour, W. of Burnt I., and N. of Western Duck I., Manitoulin dist., Ont.

**Riddell**; mount, also creek, northwest of Tulameen, Yale district, B.C.

**Riddell**; mount, between Macmillan and Ross rivers, also river tributary to the Macmillan, Yukon.

**Ridgeway**; creek, tributary to Moyie river, Kootenay district, B.C.

**Riding**; mountain, western Manitoba.

**Ridley**; island, south of Kaien island, Chatham sound, Coast district, B.C. (Not Flat nor North Porpoise.)

**Rigaud**; river, a small tributary of the Ottawa river, Glengarry and Prescott counties, Ont. and Vaudreuil county, Que. (Not rivière à la Graisse.)

*Right Hand.* See Campbell.

**Rigolet**; settlement, at narrows of Hamilton inlet, Ashuanipi territory, Que. (Not Rigoulette.)

**Riley**; brook, tributary to Tobique river, Victoria county, N.B.

**Rinda**; a spur of the Valhalla mountains, Kootenay district, B.C.

**Ringnes**; islands, southwest of Axel Heiberg island, N.W.T.

**Rink**; rapid, in Lewes river, below Tatchun river, Yukon.

**Riordon**; point, Boxer reach, Coast district, B.C.

**Rip**; point, Active pass, strait of Georgia, New Westminster district, B.C.

**Ripple**; reef, west of Lyal island, Bruce county, Ont.

*Ripple.* See Hawkins.

**Riske**; creek, trib. to Fraser R., above Chilcotin R., Cariboo and Lillooet dists., B.C.

**Ristigouche**; township, Bonaventure county, Que. (Not Restigouche.)

*Ristigouche.* See Restigouche.

**Ritchie**; point, north extreme of Kaien island, Coast district, B.C. (Not Hays.)

*River Beaudette.* See Baudet.

*River Denys.* See Denys.

**River John**; post village, Pictou county, N.S.

*River.* See Lewes.

**Rivers**; lake of the, southern Saskatchewan.

**Rivière-à-la-Martre**; village, also light, signal and telegraph station, Christie township, Gaspe county, Que. (Not Martin River nor Rivière à la Marte.) See also Martre (rivière à la).

**Rivière-à-Pierre**; parish and village, Portneuf county, Que. (Not Rivière à Pierre.) See also Pierre (rivière à.)

**Rivière-des-Caches**; village, Northumberland county, N.B. (Not River de Cache nor Rivière du Cache.)

**Rivière-des-Chûtes**; village, Carleton county, N.B. (Not River de Chute.)

**Rivière-des-Fèves**; hamlet, Chateauguay county, Que. (Not Rivières des Fèves.)

**Rivière-des-Prairies**; village, Laval county, Que. (Not Rivière des Prairies.) See also Prairies.

**Rivière-du-Loup**; town, Temiscouata county, Que.

**Rixon**; rock, near North point, at entrance to Georgian bay, Manitoulin district, Ont.

*Roach.* See Roche.

**Roaring**; river, tributary to Swan river, western Manitoba. (Not Rolling.)

**Roberson**; point, northeast coast of Digby island, Coast district, B.C.

**Robert**; island, northeast of Grenadier island, St. Lawrence river, Leeds county, Ont. (Not Cherry nor Sumac.)

**Robert**; lake, Marten river, above Tesekau lake, Mistassini territory, Que.

**Robert**; point, Markham bay, Hudson strait, N.W.T.

**Roberts**; bay, in South bay, Manitoulin island, Manitoulin district, Ont.

**Robertson**; cove, north of Lizard islands, Algoma district, Ont. (Not Jackson.)

**Robertson**; creek, tributary to Little Slocan river, Kootenay district, B.C.

**Robertson**; lakes, Privat township, Timiskaming county, Que.

**Robertson**; mount, near Stikine river, north of Iskut river, Cassiar district, B.C.

**Robertson**; railway station, Megantic county, Que. (Not Robertson Station post office.)

*Robertson Station.* See Robertson.

**Robinson**; cove, Big island, bay of Quinte, Prince Edward county, Ont.

**Robinson**; island, S. of Whitney Pt., St. Lawrence R., Leeds Co., Ont. (Not Raspberry.)

**Robinson**; lake and river, S. of N. T. Ry., N.E. of L. Nipigon, Thunder Bay dist., Ont.

**Robinson**; sound, northeast of Cornell Grinnell bay, N.W.T. (Not Robinson's.)

**Rob Roy**; creek, tributary to Dominion creek, Indian river, Yukon.

**Robson**; mount, headwaters of Fraser river, Cariboo district, B.C.

**Robson**; pass, north of mount Robson, Rocky mountains, Cariboo district, B.C.

**Robson**; town, on Columbia river, Kootenay district, B.C.

**Roche**; lake, Tp. 17, R. 16, W. 6 M., Yale district, B.C. (Not Roach.)

*Roche à Veillons.* See Algernon.

**Roche de Smet**; west of Jasper lake, western Alberta. (Not Roche Suette.)

**Rochelle**; hamlet, Shefford county, Que. (Not Ste. Anne-de-Stukely.)

**Roche-Percée**; railway station, southeastern Saskatchewan. (Not Roche Percé.)

**Roche-Percée**; reef, St. Lawrence river, opposite Cacouna, Temiscouata county, Que.

*Rocher.* See Taltson.

**Rocher Déboulé**; mountains, south of Hazelton, Cassiar district, B.C. (Not Rochers Déboulés.) Previous decision revised.

**Roches** (lac des); lake, at head of Nehalliston creek, Kamloops and Lillooet districts, B.C.

**Rochers** (pointe des); point, below cape Salmon, Charlevoix county, Que.

*Roche Suette.* See Roche de Smet.

**Rock**; lake, Nightingale township, Haliburton county, Ont.

*Rock.* See Kikomun.

*Rock.* See Lazy.

*Rock.* See Taltson.

**Rockcliffe**; police village, Carleton county, Ont. (Not Rockliffe.)

*Rockliffe.* See Stonecliff.

**Rocksprings**; hamlet, Leeds county, Ont. (Not Rock Springs.)

*Rocky.* See Descanso.

*Rocky.* See Opabin.

*Rocky.* See Tinson.

**Roes Welcome**; sound, in the northwestern portion of Hudson bay, N.W.T. (Not Rowe's Welcome nor Sir Thomas Rowe's Welcome.)

**Roger**; lake, northwest of Expanse lake, Timiskaming county, Que. (Not Rogers.)

**Rogers**; glacier, pass and peak, and Rogers Pass railway station, Selkirk mountains, Kootenay district, B.C.

*Rogers.* See Prim.

*Rogers.* See Roger.

**Rogersville**; parish, Northumberland county, N.B. (Not Rogerville.)

**Roggan**; river, emptying into James bay, New Quebec. (Not Bishop Roggan nor Great Bishop Roggan.)

**Rogue**; river, tributary to Hess river, Yukon.

**Rolleston**; island, northwest of Grenadier I., St. Lawrence river, Leeds county, Ont.

*Rolling.* See Roaring.

**Rollingdam**; village, Charlotte county, N.B. (Not Rolling Dam.)

**Rolph**; creek, tributary to St. Mary river, southern Alberta.

**Romaine**; river, lower St. Lawrence, opposite Mingan islands, Saguenay Co., Que.

**Rond** (cap); cape, east end of Madame island, Richmond county, N.S. (Not La Ronde nor Round.)

**Rondeau**; harbour and village, on lake Erie, Kent Co., Ont. (Not Rond Eau.)

**Root**; river, flowing southwesterly into L. Seul, Patricia district, Ont.

*Root.* See Carrot.

**Rory**; creek, flowing southeasterly into Howser creek, Kootenay district, B.C.

**Rosamond**; lake, N.W. of Rugby township, Kenora district, Ont. (Not Rosamund.)

**Rose**; island, between Broughton and Robert islands, St. Lawrence river, Leeds county, Ont. (Not Grape nor Grass.)

**Rose**; lake, on international boundary, Thunder Bay district, Ont. (Not Mud.)

**Rose**; lake and river, at headwaters of Nisutlin river, Yukon.

**Rose**; pass, at head of St. Mary river, Kootenay district, B.C.

**Roseau**; river, flowing westerly into Red river, southeastern Manitoba.

**Rosebud**; creek, tributary to Stewart river, Yukon.

**Rosebud**; river, tributary to Red Deer river, Alberta. (Not Arrowhead.)

**Rosenfeld**; rock, northeasterly from the east point of Saturna island, strait of Georgia, New Westminster district, B.C. (Not Rosenfelt.)

**Roseville**; village, Prince Co., P.E.I. (Not Little nor S. Miningash nor Minimegash.)

**Ross**; creek, flowing into the S. Saskatchewan at Medicine Hat, Alberta.

**Ross**; island, between East and West channels Nelson river, Manitoba.

**Ross**; isthmus and peninsula, northwestern portion of Franklin isthmus, N.W.T. (Not James Ross.)

**Ross**; lake, northwest of Affleck lake, Kenora district, Ont.

**Ross**; lake, south of Stephen station, Kootenay district, B.C.

**Ross**; peak, Selkirk mountains, Kootenay district, B.C.

**Ross**; river, tributary to Pelly river, Yukon.

**Rossmore**; village, Ameliasburg township, Prince Edward county, Ont.

**Rouge**; lake, Wolfe township, Terrebonne county, Que. (Not lac de la Rouge.)

**Rouge**; river, flowing into lake Ontario, Ontario and York counties, Ont. (Not Rouge creek nor Big Rouge creek.)

**Rough**; island, northeast of Grenadier island, St. Lawrence river, Leeds county, Ont. (Not Hamilton nor Little.)

*Rougie.* See Salisbury.

**Round**; lake, on Qu'Appelle river, southeastern Saskatchewan.

*Round.* See Campbell.

*Round.* See Felice.

*Round.* See Francis.

*Round.* See Ghost.

*Round.* See Joubert.

*Round.* See Lacroix.

*Round.* See Rond.

*Round.* See Skelton.

*Rousseau.* See Arosen.

**Rousselet**; island, at the north end of lake Timiskaming, Ont.

*Roussin.* See Arosen.

**Route**; lake, west of Asheigamo lake, Kenora district, Ont.

**Routhier**; lake, Rouyn township, Timiskaming county, Que. (Not Rush.)

*Rouville.* See St. Hilaire.

**Rouyn**; lake, Rouyn township, Timiskaming county, Que. (Not Stewart.)

*Rove.* See Watap.

**Rowan**; lake, northeast of Kakagi lake, Kenora district, Ont.

**Rowe**; island, northern one of Lizard group, Algoma district, Ont. (Not N. Lizard.)

*Rowes.* See Roes.

**Rowley**; island, Navy group, St. Lawrence river, Leeds county, Ont.

**Rowlinson**; creek, tributary to Nordenskiöld river, Yukon.

**Roxburgh**; post settlement, Albert county, N.B. (Not Roxborough.)

**Roxton East**; hamlet, Shefford county, Que.

**Royal**; island, Brock group, St. Lawrence river, Leeds county, Ont. (Not Bathing.)

**Royal**; roads, south of Esquimalt harbour, Vancouver island, B.C. (Not Royal bay.)

*Royal George.* See Myles.

*Ruban.* See Ribbon.

**Ruby**; creek, tributary to Indian river, Yukon.

**Ruby**; creek and mountain, west of Surprise lake, Cassiar district, B.C.

**Ruby**; mountain, E. of Columbia R., between the Arrow lakes, Kootenay district, B.C.

**Rudyard**; reef, west of Queen point, Manitoulin island, Manitoulin district, Ont.

**Ruel**; shoal, southwest of Dead island, at entrance to Key harbour, Georgian bay, Parry Sound district, Ont.

*Rugged.* See Locke.

*Rugged Island.* See Lockeport.

**Rundle**; mount, between Bow and Spray rivers, Rocky Mountains park, Alberta.

**Rupert**; bay and river, Mistassini territory, Que. Rupert House, H. B. Co., is at the mouth of the river.

**Rusagonis**; river and village, Sunbury Co., N.B. (Not Rusagornis nor Rushagornis.)

**Ruscom**; railway station and river, Essex county, Ont. Not Ruscomb river and village nor Ruscom Station.)

*Rush.* See Routhier.

*Rushagornis.* See Rusagonis.

**Russel**; creek, tributary to Little Slocan river, Kootenay district, B.C.

**Russel**; island and reef, S.E. of Cove I., at entrance to Georgian bay, Bruce Co., Ont.

**Russell**; arm and point, northwest side of Prince Rupert harbour, Coast district, B.C.

**Ruth**; island, Nanoose harbour, east coast of Vancouver island, B.C.

**Ruth**; lake and river, W. of Nakina R. and S. of Chikoida Mt., Cassiar district, B.C.

**Ryckman**; village, Wentworth county, Ont. (Not Ryckman's Corners.)

*Rykerts.* See Bedlington.

## S

**Saanich**; inlet, southeast coast of Vancouver island, B.C.

**Saanichton**; bay and village, S.E. coast of Vancouver I., B.C. (Not Cordova bay.) To avoid duplication of "Cordova" applied to a large bay to the south.

**Sable**; river, southeast of Chiefs point, Bruce county, Ont.

*Sable.* See Ausable.

**Sachigo**; lake, and river tributary to Severn river, Patricia district, Ont. (Not Achigo.)

*Sackawatisi.* See Sassawatisi.

**Sacré-Cœur-de-Marie**; village, Thetford township, Megantic county, Que. (Not Sacré-Cœur de Marie.)

**Saddle**; hill, south of Satellite channel, Vancouver island, B.C. (Not Arbutus.)

**Saddle**; lake, also Saddle Lake, post office, eastern Alberta.

**Saddle**; mountain, near confluence of Stikine and Anuk rivers, Cassiar district, B.C.

**Saddle**; mountain, southeast of Fairview mountain, Alberta. (Not 'The Saddle.')

*Saddle.* See Ragged.

**Saddleback**; island, northwest of Pritzler harbour, Hudson strait, N.W.T.

**Sagaminnis**; lake, southwest of Wapikopa lake, upper Winisk river, Patricia, Ont.

**Saganaga**; lake, on international boundary, Rainy River and Thunder Bay districts, Ont. (Not Seiganagah, Seiganagan nor Seiganagaw.)

*Saganaga.* See Boyer.

**Sagemace**; bay, in southern portion of lake Winnipegosis, Manitoba.

*Sahpoochaway.* See Odei.

*Sah-wah-mish-she.* See Sawamisshie.

**Sain**; cape, above Pointe-au-Pic, Charlevoix county, Que.

**Ste. Agathe-des-Monts**; village, Terrebonne county, Que. (Not St. Agathe des Monts nor Ste Agathe des Monts.)

**Ste. Agnès-de-Dundee**; hamlet, Huntingdon county, Que. (Not Ste. Agnès nor Ste. Agnès de Dundee.)

**St. Alexandre**; parish and village, Iberville county, Que. (Not St. Alexander.)

**St. Alphonse-de-Granby**; village, Shefford Co., Que. (Not St. Alphonse de Granby.)

**St. André**; bank, parish, point, and village, Kamouraska county, Que.

**St. André-de-Ristigouche**; hamlet, Ristigouche township, Bonaventure county, Que. (Not St. André de Restigouche.)

**St. Andrew**; channel, southeast of Boularderie island, Cape Breton and Victoria counties, N.S.

**St. Andrew**; lake, in Tps. 31 and 32, R. 1 E.P.M., Manitoba. (Not Long.)

**St. Andrews**; town, Charlotte county, N.B. (Not St. Andrew's.)

**St. Andrews**; village, Argenteuil county, Que. (Not St. Andrews East.)

**St. Andrews**; village, Stormont county, Ont. (Not St. Andrews West.)

**Ste. Angèle-de-Rimouski**; village, Matane county, Que. (Not Ste. Angele de Mercie.)

**St. Ann**; bay, harbour, and village, Victoria county, N.S.

**St. Ann**; lake, central Alberta.

**St. Ann**; village, Lincoln county, Ont. (Not St. Anne nor St. Ann's.)

**St. Anne**; island, at the mouth of St. Clair river, Lambton county, Ont. (Not St. Anne's nor St. Ann's.)

**Ste. Anne-de-Bellevue**; village, Jacques Cartier county, Que. (Not Ste Anne de Bellevue nor Ste. Anne du bout de L'Ile.)

**Ste. Anne-des-Monts**; village, Gaspe county, Que. (Not Ste. Anne de Monts.)

*Ste. Anne-de-Stukely.* See Rochelle.

*Ste. Anne du bout de L'Ile.* See Ste. Anne-de-Bellevue.

**St. Anthony**; lake, Skead township, Timiskaming district, Ont.

**St. Antoine-de-Pontbriand**; village, Thetford township, Megantic county, Que. (Not St. Antoine de Pontbriand.)

**St. Antoine-de-Tilly**; village, Lotbinière county, Que. (Not St. Antoine, Lotbinière.)

*St. Antoine, Lotbinière.* See St. Antoine-de-Tilly.

**St. Augustin**; river, flowing southerly into the gulf of St. Lawrence, Saguenay county, Que. (Not St. Augustine.) Decision based on priority of publication.

**St. Barnabé-rivière-Yamaska**; settlement, St. Hyacinthe county, Que. (Not St. Barnabé, river Yamaska.)

**St. Basile-de-Portneuf**; parish and village, Portneuf county, Que. (Not St. Bazile de Portneuf.)

**St. Bernard-Sud**; hamlet, St. Johns Co., Que. (Not St. Bernard nor St. Bernard S.)

**Ste. Brigide**; village, Iberville Co., Que. (Not Ste. Brigide d'Iberville.)

**St. Casimir**; parish, and village, Portneuf county, Que.

**St. Catharines**; city, Lincoln county, Ont. (Not St. Catherines.)

**Ste. Cécile-de-Levrard**; parish, Nicolet county, Que. (Not St. Cécile de Levrard.)

**Ste. Cécile-de-Milton**; village, Shefford county, Que.

**St. Charles-de-Caplan**; village, Bonaventure county, Que. (Not St. Charles Caplin.)

**St. Clair**; lake and river, Essex, Kent and Lambton counties, Ont.

**St. Columban**; village, Two Mountains Co., Que. (Not St. Colomban nor St. Columbin.)

**St. Croix**; lake, Hants county, N.S. (Not St. Croix River lake.)

*St. Croix.* See Ponhook.

**Saint-Cyr**; mount, north of Quiet lake, Yukon.

**St. David**; lake, in Tps. 31 and 32, R. 1, W. P. M., Manitoba.

**St. David**; village, Lincoln county, Ont. (Not St. David's.)

**St. Denis**; cove, parish, point and village, Kamouraska county, Que. Not St. Denis de la Bouteillerie village.)

**St. Dominique-de-Bagot**; village, Bagot Co., Que. (Not St. Dominique de Bagot.)

**St. Edmond**; parish, Humqui township, Matane county, Que.

**Ste. Edwidge**; village, Clifton township, Compton county, Que. (Not St. Edwidge.)

**St. Eleuthère**; parish, Kamouraska county, Que.

*Ste. Emelie.* See Ste Emmélie.

*Ste. Emilie.* See Ste. Emmélie.

**Ste. Emmélie**; parish and village, Lotbinière Co., Que. (Not Ste. Emelie nor Ste. Emilie.)

**St. Etienne**; parish, Charlevoix county, Que.

*St. Etienne.* See Baillargeon.

**St. Etienne-de-Beauharnois**; village, Beauharnois county, Que. (Not St. Etienne nor St. Etienne de Beauharnois.)

**St. Eugene**; mission, on St. Mary river, Kootenay district, B.C.

**St. Eugène-de-Guigues**; hamlet, Guigues township, Timiskaming county, Que. (Not Ste. Eugene de Guigues.)

**St. Fidèle**; post settlement, Charlevoix county, Que.

**Ste. Florence**; parish and village, Matane county, Que.

**Ste. Foy**; parish and village, Quebec county, Que. (Not St. Foy.)

**St. Francis**; lake, Frontenac county, and river flowing from the lake, through the counties of Wolfe, Compton, Sherbrooke, Richmond, Drummond, and Yamaska, emptying into the St. Lawrence at lake St. Peter, Que. French form, St. François.

**Ste. Geneviève**; group of islands, E. of Ste. Anne-de-Bellevue, Jacques Cartier Co., Que.

**St. George**; cape, St. Peter inlet, Richmond county, N.S. (Not George.) To distinguish it from cape George in Antigonish county.

**St. George**; lake, Tps. 31-2-3, R. 1 E. and Tp. 31, R. 1 W. P.M., Man. (Not. St. George's.)

*St. George Port Daniel.* See Port Daniel.

**St. Germain**; parish and village, Kamouraska county, Que.

*St. Grégoire.* See Mount Johnson.

**St. Hector**; hamlet, Bagot county, Que. (Not St. Hector de Bagot.)

*St. Hector de Bagot.* See St. Hector.

**St. Helen**; island, in the St. Lawrence, near Montreal, Laval county, Que. (Not St. Helen's.) French usage, Ste. Hélène.

**St. Helena**; island, northeast of Grenadier island, St. Lawrence river, Leeds county, Ont. (Not Cherry nor Goulbourne.)

**Ste. Hélène-de-Bagot**; village, Bagot county, Que. (Not Ste. Hélène de Bagot.)

**St. Henri**; village, Lévis county, Que. (Not St. Henri Station.)

*St. Henri Station.* See St. Henri.

**St. Hilaire**; mountain, near St. Hilaire, Rouville county, Que. (Not Belœil nor Rouville.)

**St. Hilary**; mount, southeast of Braeburn lake, southern Yukon.

**St. Irénée**; parish and post village, Charlevoix county, Que.

*St. Jean Deschaillons.* See Deschaillons.

**St. Joachim**; village, Essex county, Ont. (Not St. Joachim River Ruscom.)

**St. Joachim-de-Shefford**; village, Shefford Co., Que. (Not St. Joachim de Shefford.)

**St. John**; creek and ridge, west of Beaverdell creek, Similkameen district, B.C.

**St. John**; island, Melville lake, Ashuanipi territory, Que. (Not St. Johns.)

**St. John**; mount, southwest of Windigo bay, L. Nipigon, Thunder Bay district, Ont.

**St. Johns**; county and town, on Richelieu river, Que. (Not St. John's.)

**St. Joseph**; village, south of Goderich, Huron county, Ont.

**St. Joseph-de-St.-Hyacinthe**; village, St. Hyacinthe county, Que. (Not St. Joseph de St. Hyacinthe.)

*St. Joseph d'Orleans.* See Orleans.

**St. Lambert**; village, Chambly county, Que. (Not St. Lambert, Chambly.)

**St. Laurent**; village, Jacques-Cartier county, Que. (Not St. Laurent, Montreal.)

*St. Laurent, Montreal.* See St. Laurent.

**St. Lawrence**; island, Lake Fleet group, St. Lawrence river, Leeds county, Ont.

**St. Louis-de-Chambord**; parish, Lake St. John county, Que.

**St. Marc-des-Carrières**; parish and village, Portneuf county, Que. (Not St. Marc des Carrières.)

**St. Margaret**; bay, Halifax county, N.S. (Not St. Margaret's.)

**Ste. Marguerite**; river, tributary to Saguenay river, Chicoutimi and Saguenay counties, Que. (Not St. Margaret.)

*Ste. Marguerite.* See Marguerite.

**St. Martin**; lake, northeast of lake Manitoba, Man. (Not St. Martin's.)

*St. Martin.* See Martin.

**St. Martins**; lightstation, parish and village, St. John county, N.B. (Not Quaco, nor St. Martin's P. O.)

**St. Mary**; bay and cape, Digby county, N.S.

**St. Mary**; lake, Ridout township, Muskoka district, Ont.

**St. Mary**; lake, Saltspring island, southeast coast of Vancouver island, B.C.

**St. Mary**; lake, and river tributary to Kootenay river, B.C. (Not Torrent.)

**St. Mary**; village, Kent county, N.B.

**St. Mary**; river, joining lakes Huron and Superior, international boundary line between Canada and United States. (Not St. Mary's.)

The narrows between point Iroquois and Gros cap is to be considered the head of the river, and that between old Fort St. Joe and Sweet point the mouth of the south branch. The north branch, passing through East Neebish rapids, also carries the name of the river, through St. Joseph channel, to the narrows between Bowker point and Gravel point.

**St. Mary**; river, Guysborough county, N.S.

**St. Mary**; river, tributary to Belly river, southern Alberta. (Not St. Mary's.)

**St. Marys**; town, Perth county, Ont. (Not St. Mary's.)

**St. Maurice**; county and river, Que.

**St. Michel-de-Rougemont**; village, Rouville Co., Que. (Not St. Michel de Rougemont.)

**Ste. Monique**; hamlet, Two Mountains county, Que. (Not Ste. Monique des Deux Montagnes.)

*Ste. Monique des Deux Montagnes.* See Ste. Monique.

**St. Nicholas**; peak, north of mount Gordon, Rocky mountains, Alberta.

**St. Nora**; lake, Stanhope township, Haliburton county, Ont. (Not St. Nora's.)

**St. Onge**; post office, near Embrun, Russell county, Ont.

**St. Pamphile**; village, L'Islet county, Que.

**St. Patrick**; channel, an arm opening to the westward from Great Bras d'Or, Inverness and Victoria counties, N.S.

**St. Patrick**; lake, in Tps. 32 and 33, R. 1 E. and W. P. M., Manitoba.

*St. Patrick's.* See San Josef.

**St. Paul**; village, Kent county, N.B. (Not St. Pauls.)

*St. Paul.* See Nuns.

**St. Paul-du-Buton**; parish and hamlet, Montmagny county, Que. (Not St. Paul de Buton.)

*St. Paul's Bay.* See Baie-St.-Paul

**Ste. Perpétue**; village, Argenteuil county, Que.

**St. Peter**; bay, river and village, Kings county, P.E.I. (Not St. Peter's nor Head of St. Peter's bay.)

**St. Peter**; island, Hillsborough bay, Queens county, P.E.I. (Not St. Peter's.)

**St. Pierre-les-Becquets**; parish and hamlet, Nicolet county, Que. Not St. Pierre des Becquets nor St. Pierre les Bequets.)

**St. Piran**; mount, west of Lake Louise railway station, Alberta.

**St. Raphael**; village, Glengarry Co., Ont. (Not St. Rafael nor St. Raphael West.)

**St. Regis**; hamlet, Huntingdon county, Que. (Not St. Régis.)

**St. Roch-des-Aulnaies**; village, L'Islet county, Que. (Not St. Roch des Aulnets.)

**Ste. Rosalie**; island, in Ottawa river, near Montebello, Labelle county, Que.

**St. Siméon**; parish and village, Charlevoix county, Que.

**St. Simon-de-Yamaska**; village, Bagot county, Que. (Not St. Simon d'Yamaska.)

**St. Sixte**; lake, and river trib. to Petite-Nation R., Labelle Co., Que. (Not Sincique.)

**St. Stanislas-de-Kostka**; village, Beauharnois county, Que. (Not St. Stanislas.)

**St. Stephen**; town, Charlotte county, N.B. (Not St. Stephens.)

**St. Théodore-d'Acton**; village, Bagot county, Que.

**Ste. Thérèse-de-Blainville**; village, Terrebonne county, Que. (Not Ste. Thérèse not Ste. Thérèse de Blainville.)

**St. Urbain-de-Chateauguay**; parish and village, Chateauguay county, Que. (Not St. Urbain de Chateauguay nor St. Urbain en haut.)

**St. Valentin**; parish and village, St. Johns county, Que. (Not St. Valentine.)

**Sakwatamau**; river, tributary to Athabaska R., Alta. (Not Eagle nor Sa-kwa-ta-mow.)

**Salem**; post village, Cumberland county, N.S. (Not Salent.)

*Salent.* See Salem.

**Salisbury**; bay, Albert county, N.B. (Not Rougie.)

**Salmo**; river, flowing southerly into Pend-d'Oreille river, Kootenay district, B.C. (Not Salmon.)

**Salmon**; arm, southerly portion of Shuswap lake, also river emptying into the arm from the south, Kamloops district, B.C.

**Salmon**; cape, above pointe des Rochers, Charlevoix county, Que. French usage Saumon (cap au).

**Salmon**; island, north side of Big bay, Hastings county, Ont.

**Salmon**; river flowing into Big bay, Hastings and Lennox counties, Ont.

*Salmon.* See Kinonge.

*Salmon.* See Salmo.

*Salmon.* See Templeton.

*Salmon.* See Wicked.

**Salmon Arm**; village, on Salmon arm, Shuswap lake, Kamloops district, B.C.

**Salone**; lake, on Manuan river, Champlain county, Que. (Not Antikamisk nor Kapitoukamick.)

**Salt**: point, Presqu'île peninsula, Brighton township, Northumberland county, Ont.

*Salt.* See Way.

**Saltspring**; island, southeast coast of Vancouver I., B.C. (Not Admiral nor Chuan.)

**Salvus**; railway station, north shore of Skeena river, Coast district, B.C.

**Samson**; peak, north of the narrows of Maligne lake, Rocky Mts., western Alberta.

**Sand**; bay, outlet of Rainy lake, international boundary, Rainy River district, Ont.

**Sand**; creek, tributary to Kootenay river, Kootenay district, B.C.

*Sand.* See Desert.

*Sand.* See Hyndman.

**Sanderson**; point, west side of Lower Arrow lake, Kootenay district, B.C.

*Sanderson.* See Inonoaklin.

**Sand Point**; lake, southeast of Namakan L., Int. boundary, Rainy River district, Ont.

*Sandy.* See Pakwa.

*Sandy.* See Tramping.

**Sandy-beach**; lake, at headwaters of St. Maurice river, Champlain county, Que.

**Sanford**; mount, southwest of Snowdon range, Cassiar district, B.C.

**Sangrida**; peak, Valkyr mountains, Kootenay district, B.C.

**San Josef**; bay, near N.W. end of Vancouver I., B.C. (Not San Joseph nor St. Patrick's.)

**San Juan**; river, flowing into Juan de Fuca strait, Vancouver island, B.C.

**San Miguel**; group of islands, off the entrance to Friendly cove, Nootka sound, Vancouver island, B.C.

**Sansum**; narrows, between Saltspring and Vancouver islands, B.C.

*Sapasook.* See Sapasuk.

*Sapasoose.* See Sapasuk

**Sapasuk**; lake, on N.T.Ry., northeast of L. Nipigon, Thunder Bay district, Ont. (Not Sapasook nor Sapasoose.)

**Sapphire**; col, between "The Dome" and "Castor," Selkirk Mts., Kootenay dist., B.C.
**Sarbach**; mount, north of Howse pass, Rocky mountains, Kootenay district, B.C.
**Sarcee**; butte and Indian reserve, on Elbow river, Alberta.
**Sasaginaga**; lake, northwest of Cobalt, Timiskaming district, Ont. (Not Clear.)
**Sasakwei**; lake, southwest of Peak lake, Kenora district, Ont. (Not Summit.)
**Saskatchewan**; mount, south of mount Athabaska, Rocky mountains, Alberta.
*Saskatchewan.* See Turnagain.
**Saskeram**; lake, west of Pas, Manitoba. (Not Indian Pear Island lake.)
**Sass**; river, trib. to Little Buffalo R., S. of Great Slave L., N.W.T. (Not Sass-tessi.)
**Sassaganaga**; lake, northeast of Kipawa lake, Pontiac county, Que.
**Sassawatisi**; lake, at headwaters of Manuan river, Champlain county, Que. (Not Sackawatisi nor Chisaouataisi.)
*Sass-tessi.* See Sass.
**Satasha**; lake, west of Nordenskiöld river, Yukon.
**Satellite**; channel. between Saltspring I. and Saanich peninsula, Vancouver I., B.C.
**Saturn**; rock, southwest of Greenough point, Bruce county, Ont.
**Saugeen**; peninsula, the northwestern portion of Bruce county, Ont.
**Saugeen**; river, flowing into L. Huron at Southampton, Bruce Co., Ont. (Not Saugnik.)
**Saugum**; creek, E. of Kootenay R., N. of Steele, Kootenay dist., B.C. (Not Six-mile.)
**Sault-au-Cochon**; river, Saguenay county, Que. (Not Saut de Cochon.)
**Saulteux**; river, tributary to Lesser Slave river, Alberta. (Not Sauteur nor Sauteux.)
**Saumon** (cap au); cape, above pointe des Rochers, Charlevoix county, Que. English usage (cape) Salmon.
**Saunders**; reef, near Misery bay, Manitoulin island, Manitoulin district, Ont.
*Saut de Cochon.* See Sault-au-Cochon.
*Saut de Mouton.* See Mille-Vaches.
*Sauteur.* See Saulteux.
*Sauteux.* See Saulteux.
**Savage**; hamlet, Shefford county, Que. (Not Savage's Mills.)
**Savage**; island, northeast of Whitney point, St. Lawrence river, Leeds county, Ont.
*Savage.* See Upper Savage.
**Savant**; lake, south of L. St. Joseph, Thunder Bay district, Ont.
*Savasse Berry.* See Serviceberry.
**Sawamisshi**; lake, Stanhope township, Haliburton Co., Ont. (Not Sah-wah-mish-she.)
**Sawback**; range of mountains, north of Bow river, Rocky mountains, Alberta.
**Sawback**; range of mountains, west of Stikine river, Cassiar district, B.C.
*Sawbill.* See Sheldrake.
**Sawyer**; pass, at head of St. Mary river, Kootenay district, B.C.
**Sawyerville**; parish and village, Compton county, Que.
**Saxon**; island, south of Shute point, Bruce county, Ont.
**Sayabec**; parish and railway station, Matane county, Que.
*Sayia.* See Sayyea.
**Sayunei**; range of mountains, Gravel river, N.W.T. (Not Sayunne.)
**Sayyea**; creek, tributary to upper Liard river, Yukon. (Not Sayia.)
**Scalping Knife**; mountain, east of Columbia river, Kootenay district, B.C.

**Scatari**; island, off the coast of Cape Breton I., N.S. (Not Scattarie nor Scatary.)
**Scentgrass**; lake, southeast of Jackfish lake, central Saskatchewan. (Not Scent Grass.)
**Schaffer**; mount, northwest of Mt. Biddle, Rocky mountains, Kootenay district, B.C.
*Schaw.* See Puslinch.
**Schist**; lake, northwest of Tawatinaw lake, Kenora district, Ont.
Schley land. See Ellesmere.
**Schnabel**; creek, flowing into Annie lake, southern Yukon.
**Schnare**; point, north shore of St. Margaret bay, Halifax county, N.S. (Not Snares.)
**Schnarr**; lake, Melick and Redditt townships, Kenora district, Ont.
*Schooner.* See Miles.
**Schreiber**; point, north of Kaien island, Prince Rupert harbour, Coast district, B.C.
**Schroeder**; creek, flowing into west side of Kootenay lake, 8 miles south of Lardeau, Kootenay district, B.C.
**Schwatka**; river, tributary to Nordenskiöld river, southern Yukon.
**Scorpion**; island, Lake Fleet group, St. Lawrence river, Leeds county, Ont.
**Scotch Bonnet**; island and lightstation, west of Wellington bay, Prince Edward county, Ont. (Not Egg island.)
**Scotchie**; reef, at South Baymouth, Manitoulin island, Manitoulin district, Ont.
**Scotsman**; bay, Kings county, N.S. (Not Scots, Scot's nor Scotsman's.)
**Scott**; inlet, Metlakatla bay, Coast district, B.C.
**Scott**; mount, east of Rabbit mountain, Abitibi territory, Que.
**Scott**; point, on north side of entrance to baie du Doré, Bruce county, Ont.
*Scott.* See Wright.
**Scougall**; bank, southwest of MacGregor point, Bruce county, Ont.
**Scout**; reef and spit, southwest of Burke island, Bruce county, Ont.
*Scratching.* See Morris.
**Scroggie**; creek, tributary to Stewart river, Yukon.
**Scud**; river, tributary to Stikine river, Cassiar district, B.C.
**Sea**; lake, Murchison township, Nipissing district, Ont.
**Seagram**; lake, southwest of Manito lake, central Saskatchewan.
**Seal**; cove, at north end of Kaien island, Coast district, B.C.
*Seal.* See Dog.
*Seal.* See Tisiriuk.
**Sealion**; mountain, northeast of Moberly, Rocky mountains, Kootenay district, B.C.
*Seals Home.* See La Motte.
**Seaman**; reef, entrance to Wood bay, S. shore of Manitoulin I., Manitoulin dist., Ont.
**Seashell**; rock, west of Lyal island, Bruce county, Ont.
**Seaton**; creek, flowing into Carpenter creek at Three Forks, Kootenay district, B.C.
*Seaton.* See Seton.
**Secretary**; islands, north of Saltspring island, S.E. coast of Vancouver I., B.C.
*Secretary.* See Donaldson.
**Seechelt**; inlet, north of the strait of Georgia, B.C. (Not Sechelt.)
**Seed**; lake, east of Carp lake, international boundary, Rainy River district, Ont.
**Seeley**; village, Leeds county, Ont. (Not Seeley's Bay nor Seely's Bay.)
*Seepanock.* See Sipanok.

**Segatiga**; brook, tributary to Burntwood river, Manitoba.

**Seggemak**; lake, southeast of Boyer lake, Kenora district, Ont. (Not Black Bird.)

*Segum Sega.* See Kejimkujik.

*Seiganagah.* See Saganaga.

*Seiganagan.* See Saganaga.

*Seiganagaw.* See Saganaga.

**Sekulmun**; lake, west of Aishihik lake, Yukon.

**Sekwi**; brook, cañon ,and mountain, Gravel R., above Natla R., N.W.T.

**Selby**; lake, east of Anzhekumming lake, Kenora district, Ont. (Not Lynx.)

**Selkirk**; mount, Mitchell range, Kootenay district, B.C.

**Selkirk**; N. W. Mounted Police post, at the mouth of Lewes river, Yukon. The site of the old fort of the H. B. Co. is on the opposite bank. (Not Fort Selkirk.)

**Selous**; mount, between the forks of Macmillan river, Yukon.

**Selwyn**; island, west of Humboldt bay, lake Nipigon, Thunder Bay district, Ont.

**Selwyn**; mount, east of mount Dawson, Selkirk mountains, Kootenay district, B.C.

**Selwyn**; river, tributary to Yukon river, west of Lewes river, Yukon.

**Semenof**; hills, at confluence of Lewes and Big Salmon Rs., Yukon. (Not Semenow.)

**Semiamu**; bay, E. of Boundary bay, New Westminster dist., B.C. (Not Semiahmoo.)

**Sentinel**; mountain, above the junction of Cline and North Saskatchewan rivers, Rocky mountains, Alberta.

**Sentinel**; peak, Tp. 15, R. 4, W. 5 M., Rocky mountains, Alberta.

**Separation**; lake, English river, Kenora district, Ont.

**Separation**; point, entrance Cowichan harbour, Vancouver I., B.C. (Not Cowichan.)

*Sepewesk.* See Sipiwesk.

**Sept-Iles.** See Seven Islands.

**Seraph**; mountain, Selkirk range, Kootenay district, B.C.

**Sergent** (lac); lake, Portneuf county, Que. See also Lac-Sergent.

**Serpentine**; lake, Anstruther township, Peterborough county, Ont.

**Serviceberry**; creek, tributary to Rosebud river, Alberta. (Not Savasse Berry.)

**Seseganaga**; lake, east of Sturgeon lake, Thunder Bay district, Ont.

**Sesikinaga**; lake and river, at headwaters of Wenásaga river, Patricia district, Ont.

*Setidgi.* See Sitidgi.

**Seton**; creek and lake, west of Lillooet, Lillooet district, B.C. (Not Seaton.)

**Setting**; lake and river, Grass river, Manitoba. (Not Net Setting nor Puke-lowogein.)

**Seul** (lac); lake, Kenora and Patricia districts, Ont.

*Seven Acre.* See Melville.

**Seven Islands** (Eng. usage) Sept-Iles (Fr. usage); group of islands, bay and H. B. Co. post, north shore of St. Lawrence river, Saguenay county, Que.

**Sevenpersons**; coulée and river, southwest of Medicine Hat, Alberta. (Not Seven Persons.)

*Seven Pines.* See Bass.

**Severn**; lake and river, emptying into the southern side of Hudson bay, also H. B. Co. post at mouth of river, Patricia district, Ont. (Not Fort Severn Post.)

**Sévigny**; island, in St. Lawrence river, near Valleyfield, Soulanges county, Que. (Not Petite Ile aux Cygnes.)

*Sewell.* See Swell.

**Seymour**; arm, northerly portion of Shuswap lake, Kamloops district, B.C.

**Seymour**; creek, flowing southerly into Burrard inlet, north of Vancouver, New Westminster district, B.C.

**Shabogama**; lake and river, Pontiac and Timiskaming counties, Que. (Not Shabokama.)

**Shabumeni**; lake and river, S.W. of Cat L., Patricia district, Ont. (Not Shaboomene.)

*Shad.* See Shag.

**Shaft**; point, Departure bay, east coast of Vancouver island, B.C.

**Shag**; bay and head, Halifax county, N.S. (Not Shad.)

**Shagamu**; lake, headwaters of Shagamu river, flowing northerly into Hudson bay, Patricia district, Ont. (Not Shagamew nor Shakaneh.)

**Shaganash**; island, northeast of point Magnet, Thunder Bay district, Ont.

*Shakaneh.* See Shagamu.

**Shakes**; creek, tributary to Stikine river, south of Glenora, Cassiar district B.C.

**Shakespeare**; island, in Nipigon lake, Thunder Bay district, Ont.

**Shakwak**; valley, west of Dezadeash lake, Yukon.

**Shallop**; creek, south side of Anticosti island, Saguenay county, Que. (Not Chaloupe river nor Jupiter creek.)

**Shallow**; lake, between Bernard and Tutshi lakes, Cassiar district, B.C.

*Shallow.* See Mennin.

*Shallow.* See Pakwash.

**Shamattawa**; river, tributary to Winisk river, Patricia district, Ont. (Not Matawa nor Sha-mat-tay-wah.)

**Shames**; railway station, also river tributary to Skeena river, Coast district, B.C.

**Shamrock**; bank, southeast of Gatacre point, Manitoulin I., Manitoulin district, Ont.

**Shamus**; river, emptying into Matchimanito lake, Pontiac county, Que.

**Shangoina**; island, east of Thunder cape, Thunder Bay district, Ont.

**Shanks**; lake, Tp. 1, Rge. 21, W. 4th M., southern Alberta.

**Shannonville**; village, Tyendinaga township, Hastings county, Ont.

**Shanly**; hamlet, Grenville county, Ont. (Not Shanley.)

*Shantee.* See McMahon.

*Shanty.* See McMahon.

**Sharbau**; island, at southeastern entrance to Rivers inlet, Coast district, B.C. (Not Sharban.) Reversal of previous decision.

**Sharp**; lake, northwest of Cobalt, Timiskaming district, Ont.

**Sharp**; mount, east of mount Goodsir, Rocky mountains, Kootenay district, B.C.

*Sharp.* See Jack.

**Sharpe**; creek, flowing westerly into Bulkley river, below Moricetown, Cassiar district, B.C. (Not Boulder.)

*Sharp Mountain.* See Elizabeth.

**Shaughnessy**; mount, N. of Hermit mountain, Selkirk Mts., Kootenay district, B.C.

**Shaver**; river, flowing easterly into Primrose lake, central Alberta and Saskatchewan.

**Shawanaga**; inlet, river and township, Parry Sound district, Ont. (Not Franklin inlet nor Shawanaga bay.)

**Shawatlan**; lake and passage, northeast of Kaien island, Coast district, B.C. (Not Shawatlans nor Shoo-wah-tlans.)

**Shawatum**; mountain, north of Nepopekum creek, Yale dist., B.C. (Not Steamboat.)

**Shawenegan**; township, St. Maurice county, Que. (Not Shawinigan nor Shawanegan.)

**Shawinigan**; lake and river, tributary to St. Maurice river, St. Maurice county, Que. (Not Shawenegan.) Previous decision revised.

**Shawinigan Falls**; town, St. Maurice county, Que. (Not Shawenegan Falls.) Previous decision revised.

**Shawnigan**; creek and lake, also Shawnigan Lake, village, Vancouver island, B.C.

**Sheaffe**; island, Brock group, St. Lawrence river, Leeds county, Ont. (Not Black Charlie nor Brush.

*Sheak.* See Sheek.

**Sheba**; a two-peaked mountain, at forks of Gun creek, Lillooet district, B.C.

**Shebeshekong**; bay, also channel between Franklin island and the mainland, Parry Sound district, Ont.

**Shecake**; island, South bay, Manitoulin district, Ont.

*Shecatica.* See Shekatika.

*Shedlui.* See Deception.

**Sheehan**; lake, Halifax county, N.S. (Not Shehea.).

**Sheek**; island, St. Lawrence river, west of Cornwall, Stormont county, Ont. (Not Sheak, Sheek's, Sheik's, Shieck nor Shieck's.)

**Sheep**; lake and mountain, east of Tatonduk river, Yukon.

**Sheep**; river, tributary to Highwood river, southern Alberta. (Not Sheep creek.)

*Sheepshank.* See Shesheeb

*Sheesheeb.* See Shesheeb.

**Sheffield Vault**; brook, flowing into Minas channel, Kings county, N.S.

**Shegunia**; river, flowing westerly into Skeena river, above Hazelton, Cassiar district, B.C. (Not She-gun-ya.)

*Shehea.* See Sheehan.

*Sheik's.* See Sheek.

**Shekatika**; bay, west of the strait of Belleisle, Saguenay Co., Que. (Not Shecatica.)

**Shelburne**; bay, harbour, and town, Shelburne Co., N.S. (Not Shelburne Harbour.)

*Shelburne Harbour.* See Shelburne.

**Sheldon**; lake, Lutterworth township, Haliburton county, Ont. (Not Sheldon's.)

**Sheldon**; lake, on Ross R., also mountain between Macmillan and Ross rivers, Yukon.

**Sheldrake**; river, Saguenay county, Que. (Not Sawbill.)

**Shell**; brook, tributary to Shell river, north of Prince Albert, Sask.

**Shell**; lake and river, tributary to the North Saskatchewan, central Saskatchewan.

**Shell**; river, tributary to Assiniboine river, western Manitoba.

**Shellbrook**; hamlet, Sec. 16, Tp. 49, R. 3, W. 3 M., Sask. (Not Shell Brook.)

**Shemogue**; harbour and town, Westmorland Co., N.B. (Not Gr. Shemogue nor Bristol.)

*Shemong.* See Chemung.

*Sheogomoc.* See Shogomoc.

**Sheol**; mountain, east of mount Aberdeen, Alberta.

**Shepherd**; mount, north of Sooke basin, Vancouver island, B.C.

**Sherbrooke**; city and county, Que. (Not Sherbrook.)

**Sherbrooke**; creek and lake, northwest of Hector station, Kootenay district, B.C.

**Sherbrooke**; islands, between Garrett and Lynedoch Is., St. Lawrence R., Leeds Co., Ont.

**Sherbrooke**; township, in Haldimand county, Ont. (Not Sherbrook.)

**Sherbrooke**; village in Guysborough county, N.S. (Not Sherbrook.)

**Sheridan**; lake, 17 miles south of Canim lake, Lillooet district, B.C. (Not Eagle.)

**Sheringham**; point, west of Sooke inlet, Vancouver island, B.C. (Not Sherringham.)

**Sherwood**; point, Presqu'île bay, Northumberland county, Ont. (Not Sherwood's.)

**Sherwood Spring**; village, Leeds county, Ont. (Not Sherwood Springs.)

**Shesheeb**; bay and point, east of Black bay, Thunder Bay district, Ont. (Not Sheepshank, Sheesheeb nor Shesheep.)

*Shesheinquann.* See Shoshokwan.

**Sheslay**; river, tributary to Inklin river, Cassiar district, B.C.

**Shezal**; cañon, Gravel river, below Natla river, N.W.T.

*Shictahawk.* See Shiktahawk.

*Shieck.* See Sheek.

**Shields**; landing, on west side of Lower Arrow lake, Kootenay district, B.C.

**Shiktahawk**; river, tributary to St. John river, Carleton county, N.B. (Not Shictahawk, Shikatehawk nor Shikitihawk.)

**Shingwak**; lake, north of Cameron lake, Kenora district, Ont. (Not Pine.)

**Shinimikas**; river, flowing into Northumberland strait, Cumberland county, N.S. (Not Chinimicash, Shinemecas, Shinemakas, Shinemicas, Shinimecas nor Shinimicas.)

**Ship**; bank, in Owen channel, Manitoulin district, Ont.

**Ship**; island, N.E. from Horse point, Ameliasburg township, Prince Edward Co., Ont.

**Shippigan**; harbour, island and village, Gloucester county, N.B. (Not Shippegan.)

**Shipwreck**; point, Kings county, Prince Edward Island.

*Shi-shi-shi.* See Octave.

**Shoal**; point, in Presqu'île bay, Brighton township, Northumberland county, Ont.

**Shoe**; island, northwest of Grenadier island, St. Lawrence river, Leeds county, Ont.

*Shoemaker.* See Ingall.

**Shogomoc**; lakes, and river tributary to St. John river, York county, N.B. (Not Sheogomoc nor Shogamoc.)

**Sholiaban**; creek and fishing station, west of Mekattina cape, Saguenay county, Que. (Not Choniaban, Souriban nor Sourilaban.)

**Shongwashu**; lake, E. of Boyer L., Kenora dist., Ont. (Not Shongwashoucheneibwin.)

*Shookum.* See Skookum.

*Shoo-wah-tlans.* See Shawatlan.

**Shoshokwan**; lake, and river tributary to upper Ottawa river, Montcalm and Pontiac counties, Que. (Not Shoshoquon nor Shesheinquann.)

*Shotbolts.* See Gonzales.

*Shoulie.* See Shulie.

*Shoushwap.* See Shuswap.

**Shubenacadie**; lake, Halifax and Hants counties, N.S. (Not Grand nor Shubenacadie Grand.)

**Shulaps**; mountain, between the forks of Bridge river, Lillooet district, B.C.

**Shulie**; river and village, Cumberland county, N.S. (Not Shoulie.)

**Shunda**; creek, flowing southeasterly enters the Saskatchewan in Tp. 40, R. 13, W. 5 M., Alberta. (Not Mire.)

**Shuswap**; lake, river and railway station, Yale district, B.C. (Not Shoushwap lake nor Spalumcheen river.)

**Shuswap**; mountains, east of Shuswap lake, Kamloops and Osoyoos districts, B.C.

**Shute**; passage, southwest of Portland island, southeast coast of Vancouver I., B.C.

**Shute**; point, on east shore of Stokes bay, Bruce county, Ont.

**Sibbald**; creek, tributary to Jumpingpound creek, southern Alberta.

**Sibell**; bay, Ladysmith harbour, Vancouver island, B.C.

**Sibert**; point, at southeast entrance to Pine Tree harbour, Bruce county, Ont.

*Sicannie Chief.* See Sikanni Chief.

**Sidney**; channel, island and town, S.E. coast of Vancouver I., B.C. (Not Sydney.)

**Sidney**; township, in Hastings county, Ont.

**Siffleur**; mountain, south of the junction of North Saskatchewan and Siffleur rivers, Rocky mountains, Alberta.

**Siffleur**; river, tributary to North Saskatchewan river, Alta.

**Sifton**; lake, south of Shabogama lake, Pontiac county, Que.

**Sifton**; mount, Hermit range, Selkirk mountains, Kootenay district, B.C.

**Sifton**; mountains, west of lake Laberge, Yukon.

*Siggia.* See Haven.

*Sikanni.* See Muskwa.

**Sikanni Chief**; river, tributary to Fort Nelson river, Peace River district, B.C. (Not Sicannie Chief.)

**Silver**; creek, flowing northerly into Fraser river, below Hope, Yale district, B.C.

**Silver**; islet, in L. Superior, 6 miles east of Thunder cape; also Silver Islet, settlement, on north shore of lake Superior, Thunder Bay district, Ont.

**Silver**; lake, lying partly on the east side of Pettypiece township, Kenora district, Ont. (Not Manitou.)

**Silver**; mountain, Lybster township, Thunder Bay district, Ont.

*Silver.* See Lowes.

**Silver Salmon**; river, tributary to Nakina river, Cassiar district, B.C.

**Silvercup**; mountains, between Trout lake, Lardeau and Healy creeks, Kootenay district, B.C. (Not Silver Cup.)

**Silverhorn**; mountain, north of Bow lake, southern Alberta.

**Silvertip**; glacier, mountain, névé and pass, northwest of Sir Sandford range, Selkirk mountains, Kootenay district, B.C.

**Simcoe**; bank and point, entrance to Providence bay, Manitoulin island, Ont.

**Simcoe**; county and lake, southeast of Georgian bay, Ont.

**Simcoe**; island, west of Wolfe island, St. Lawrence river, Frontenac county, Ont. (Not Gage.)

**Similkameen**; river, Similkameen and Yale dists., B.C. (Not South Similkameen.)

**Simmons**; creek, tributary to Stewart river, below Scroggie creek, Yukon.

*Simms.* See Sims.

**Simon**; bay and point, entrance to Greenough harbour, Bruce county, Ont.

**Simon**; lake, south of Obaska lake, Timiskaming county, Que.

**Simonette**; river, tributary to Smoky river, Alberta.

**Simonhouse**; lake, south of Cranberry lakes, western Manitoba.

**Simpson**; lake and mountains, between Liard and Frances rivers, Yukon.

**Simpson**; mount, east of Duncan lake, Kootenay district, B.C.

**Simpson**; pass and river, N.W. of Mt. Assiniboine, Alta., and Kootenay district, B.C.

**Simpson**; rock, Southgate group, Queen Charlotte sound, Coast district, B.C.

**Simpson**; settlement and H. B. Co. post, at the confluence of Liard and Mackenzie rivers, N.W.T. (Not Fort Simpson.)

**Simpson Tower**; mountain, west of Frances lake, Yukon. (Not Simpson's.)

**Sims**; bay and island, South bay, Manitoulin island, Ont. (Not Simms.)

**Sincennes**; lake, Sincennes township, Champlain county, Que. (Not Kawachikamick nor Kawashekamick.)

*Sincique.* See St. Sixte.

**Sinclair**; creek, flowing westerly into Columbia river, Kootenay district, B.C.

**Sinclair**; pass, at the head of Sinclair creek, between Brisco and Stanford ranges, Kootenay district, B.C.

*Singoosh.* See Singush.

**Singush**; lake, in Duck Mountain Forest reserve, western Manitoba. (Not Singoosh.)

**Sinking**; lake, Tps. 59 and 60, R. 6, W. 4 M., eastern Alberta.

**Sinkut**; creek and lake, south of Nechako river, Cariboo district, B.C. (Not Tsinkut.)

**Sipanok**; channel, between Carrot and Saskatchewan rivers, Sask. (Not Seepanok nor Seepanock.)

**Sipiwesk**; lake, north of Cross lake, Nelson river, Manitoba. (Not Sepewesk.)

**Sir Donald**; mount, also glacier and range of mountains in the Selkirks, B.C.

*Sir E. Homes.* See Home.

**Sir Sandford**; mount, also range of mountains and glacier, Selkirk mountains, Kootenay district, B.C.

*Sir Thomas Rowe's Welcome.* See Roes.

**Sir William**; island, west of Lynedoch island, St. Lawrence river, Leeds county, Ont.

**Sisipuk**; lake, on Churchill river, Manitoba and Saskatchewan. (Not Duck.)

**Sisson**; lake and river, tributary to Tobique river, Victoria county, N.B. (Not Little Tobique nor West Branch of Tobique river.)

**Sisters**; islands, east of Fair point and northwest of Gordon island, St. Lawrence river, Leeds county, Ont.

**Sitidgi**; lake, north of Great Bear lake, N.W.T. (Not Setidgi.)

**Siwiti**; rock, Blunden harbour, Queen Charlotte sound, Coast district, B.C.

*Six-mile.* See Saugum.

*Sixteen Mile.* See Oakville.

**Sixty**; creek, branch of Henderson creek, Yukon.

**Sixtymile**; river, tributary to Yukon river, Yukon.

**Skagit**; range of mountains and river, Yale district, B.C.

*Skaloo.* See Skelu.

**Skeena**; river, emptying into the Pacific, Cassiar and Coast dists., B.C. (Not Skena.)

**Skelton**; island, Brock group, St. Lawrence R., Leeds Co., Ont. (Not Big nor Round.)

**Skelu**; inlet, Graham island, Queen Charlotte Is., Coast district, B.C. (Not Skaloo.)

*Skena.* See Skeena.

**Skidegate**; inlet, also channel between Graham and Moresby islands, Queen Charlotte islands, Coast district, B.C.

**Skinner**; bluff, north of Cowichan harbour, Vancouver island, B.C.

**Skinner Pond**; village, Prince county, P.E.I. (Not Skinner's Pond.)

*Skirmish.* See Wild Horse.

**Skirt**; mountain, west of Esquimalt, Vancouver island, B.C. (Not Skirt hill.)

**Skoki**; mountain and valley, northwest of Fossil mountain, Rocky Mts., Alta.

**Skonun**; point, on McIntyre bay, about 6 miles east of Masset harbour, Graham island, Coast district, B.C. (Not Skon-un nor Tchow-un.)

**Skonun**; river, tributary to Sangan river, east of Skonun point, Graham island, Coast district, B.C. (Not West Branch of Sangan river.)

**Skookum**; lake, Galbraith township, Algoma district, Ont. (Not Shookum.)

**Slade**; creek, flowing northeasterly from Glacier lake into Horsethief creek, Kootenay district, B.C. (Not Boulder.)

**Slate**; creek, tributary to Klondike river, Yukon.

**Slate**; lake, on Wenasaga river, northwest of L. Seul, Patricia district, Ont.

**Slate**; pass, between headwaters of Klondike and McQuesten rivers, Yukon.

**Slaughenwhite**; point, northeast of Head harbour, St. Margaret bay, Halifax county, N.S. (Not Oakland.)

*Slave.* See Lesser Slave.

*Slave.* See Sleeve.

**Sleepy**; river, emptying into Obaska lake, Timiskaming county, Que.

**Sleeve**; lake, Tps. 59 & 60, R. 6, W. 4 M., eastern Alberta. (Not Slave.)

**Slipper**; mount, Lat. 65° 16′, between Cathedral and Tindir creeks, Yukon.

**Slocan**; lake, river and town, Kootenay district, B.C. (Not Slocan City.)

*Slocoh.* See Sloko.

**Sloko**; inlet, lake, mountain and river, Cassiar district, B.C. (Not Slocoh.)

*Small.* See Little Bow.

**Small Duck**; creek, tributary to Rock creek, Klondike river, Yukon.

*Small Trout.* See Meggisi.

**Smart**; mount, west of mount Bonney, Selkirk mountains, Kootenay district, B.C.

**Smith**; creek, tributary to the south branch of Brazeau river, central Alberta.

**Smith**; point, southwestern point of Cockburn island, Manitoulin district, Ont.

**Smith**; rock, in Fitzwilliam channel, Manitoulin district, Ont.

*Smith.* See Wynott.

*Smith's.* See Riall.

*Smith's.* See Nith.

**Smiths Falls**; railway station and town, Lanark county, Ont. (Not Smith's Falls.)

*Smith's.* See Port Hood.

**Smoke**; lake, in Algonquin National park, Nipissing district, Ont.

**Smoke**; point, in Weller bay, Ameliasburg township, Prince Edward county, Ont.

*Smoke.* See Aubrey.

*Smoke.* See Hickey.

**Smokehouse**; island, north of Chiefs point, Bruce county, Ont.

**Smoky**; lake, northwest of Victoria settlement, Alberta.

**Smoky**; river, tributary to Peace river, Alberta. (Not Smoking.)

**Smoothrock**; lake, northwest of L. Nipigon, Thunder Bay district, Ont. (Not Smooth Rock Island lake.)

**Smoothrock**; lake, south of Manitou lake, Kenora district, Ont. (Not Clear.)

**Snake**; island, north of Cedar island, bay of Quinte, Hastings county, Ont.

**Snake**; island, off Departure bay, east coast of Vancouver I., B.C. (Not Lighthouse.)

*Snake.* See Bloomfield.

*Snake.* See Fox.

*Snake.* See McCallum.

*Snake.* See Matheson.

*Snake.* See Sylvan.

*Snares.* See Schnare.

**Snider**; hamlet, Halton county, Ont. (Not Snider's Corners.)

**Snider**; rock, northwest of Martini I., S.W. coast of Digby I., Coast district, B.C.

*Snider's Corners.* See Snider.

**Snowcap**; mountain, west of lower part of Stikine river, Cassiar district, B.C.

**Snowdon**; range of mountains, southeast of Gladys lake, Cassiar district, B.C.

**Snowslide**; creek, tributary to Cariboo creek, Kootenay district, B.C.

**Snowy**; mountain, east of Stikine river, near the elbow, Cassiar district, B.C.

**Sockeye**; railway station, north shore of Skeena river, Coast district, B.C.

**Soda**; creek, flowing into upper branch of Hunker creek, Yukon.

**Sodalite**; valley, east of Ice river, Rocky mountains, Kootenay district, B.C.

**Sœurs** (île des). See also Nuns island.

**Sogakwa**; portage, at head of Pizustigwan river, upper Winisk river, Patricia district, Ont.

**Solitude**; mountain, east of Columbia river, Rocky mountains, Kootenay district, B.C.

**Solmes**; island, east of Telegraph island, bay of Quinte, Prince Edward county, Ont.

**Solmesville**; village, Sophiasburg township, Prince Edward county, Ont.

**Solomons Temples**; islands, north of Charlton island, James bay, N.W.T. (Not Solomon Temple.)

**Somass**; river, flowing into the head of Alberni canal, Vancouver island, B.C. (Not Somas, Somos, Sumas, nor Sumass.)

**Somenos**; lake and post settlement, north of Cowichan river, Vancouver island, B.C.

**Somerset**; island, north of Boothia peninsula, N.W.T. (Not North Somerset.)

**Sonata**; mountain and névé, Selkirk mountains, Kootenay district, B.C.

**Sonora**; island, between Nodales and Okisollo channels, Coast district, B.C. The northern portion of what was formerly Valdes island.

**Sooke**; basin, bay, harbour, inlet, lake and river, Vancouver island, B.C.

**Sophia**; mountain, Kootenay and Similkameen districts, B.C.

**Sophiasburg**; township, Prince Edward county, Ont. (Not Sophiasburgh.)

**Sorcerer**; glacier and mountain, Selkirk mountains, Kootenay district, B.C.
**Soskumika**; lake, an expansion of Nottaway river, Abitibi territory, Que.
*Soulanges.* See Dondaine.
**Sounding**; creek and lake, southeastern Alberta.
**Source**; lake, in Algonquin National park, Nipissing district, Ont.
*Souriban.* See Sholiaban.
*Sourilaban.* See Sholiaban.
**Souris**; river, tributary to the Assiniboine, Manitoba and Saskatchewan.
**Souris**; town, Kings county, P.E.I. (Not East Souris.)
**South**; bay, S.E. end of Manitoulin I., Manitoulin dist., Ont. (Not Manitoulin Gulf.)
**South**; lake, on international boundary, Thunder Bay district, Ont.
*South.* See Algernon.
*South.* See Koksoak.
*South.* See Prince Edward.
**Southampton**; village, at the mouth of Saugeen river, Bruce county, Ont.
*South Antler.* See Antler.
*South Bay.* See Prince Edward.
**South Baymouth**; town site, Manitoulin island, Manitoulin district, Ont.
*South Branch of Highwood.* See Stimson.
*South Branch of Little.* See Flemming.
*South Branch of Moose.* See Mattagami.
*South Branch or Fork of Michel.* See Leach.
**South Duck**; river, flowing easterly and northerly to Duck bay, lake Winnipegosis, Man. (Not Duck River South.)
**Southern Indian**; lake, on Churchill R., Manitoba. (Not Indian nor South Indian.)
**Southesk**; river, tributary to Brazeau river, Alberta. (Not Southesk Branch.)
*Southfork.* See Castle.
*South Fork of Beaver.* See Crystal.
*South Fork of Bridge.* See Hurley.
*South Fork of Findlay.* See Lavington.
*South Fork of Gold.* See Caven.
*South Fork of Grave.* See Harmer.
*South Fork of Middle Fork of Spillimacheen.* See Vowell.
*South Fork of Oldman.* See Castle.
*South Fork of Salmon.* See Dunbar.
**South Fowl**; lake, on Int. boundary, Thunder Bay district, Ont. (Not Cock.)
**Southgate**; river, flowing southwesterly into Bute inlet, Coast district, B.C.
**South Heart**; river, flowing into the northwest end of Lesser Slave lake, Alberta.
*South Joggins.* See Joggins.
*South Joggings.* See Joggins.
*South Mya.* See Mya.
**South Nation**; river, flowing through the counties of Grenville, Dundas, Stormont, Russell, and Prescott, Ont., and emptying into the Ottawa. (Not Little Nation, Nation nor Petite Nation.)
*South Petawawa.* See Petawawa.

*South Porpoise.* See Lelu.

*South Rideau river.* See Kemptville creek.

*South Similkameen.* See Similkameen.

**South Thompson**; river, flowing from the Shuswap lakes to Kamloops lake, Kamloops district, B.C.

**South Wellington**; post settlement, west of Nanaimo river, Vancouver island, B.C.

**Southwest**; bay, in lake Evans, Abitibi territory, Que.

**Southwest**; point, Anticosti island, Saguenay county, Que. (Not South West.)

**Soyers**; lake, Minden township, Haliburton county, Ont.

*Spallumcheen.* See Shuswap.

**Spar**; lake, south of Separation lake, Kenora district, Ont.

*Spardan.* See Ferguson.

**Sparrow**; island, southwest of Stovin I., Brock group, St. Lawrence R., Leeds Co., Ont.

**Spearing**; mount, north of Tulameen river, Yale district, B.C.

**Spectacles**; rocks, 1½ miles west of Gananoque, St. Lawrence river, Leeds county, Ont.

**Spectacles**; islands (2), north of Wolfe I., St. Lawrence R., Frontenac Co., Ont.

**Spence**; lake, south of lake Winnipegosis, Manitoba.

**Spencer**; creek, tributary to Bow river, Alberta.

*Spica.* See Ospika.

**Spicer**; harbour and island, north shore of Hudson strait, N.W.T.

**Spike**; peak, northeast of Moberly, Rocky mountains, Kootenay district, B.C.

**Spillimacheen**; mountains, also river tributary to Columbia river, Kootenay district, B.C. (Not Spill En Mee Chene nor Spillimichene.)

**Spilsbury**; island, Navy group, St. Lawrence river, Leeds county, Ont.

**Spire**; island and ledge, S. of Frederick Pt., Prince Rupert harbour, Coast dist., B.C.

**Spirit**; creek, tributary to Wild Horse river, Kootenay district, B.C.

**Spirit**; river, also Spirit River, post settlement, central Alberta.

*Spirit.* See Beauchamp.

**Spit**; head, westerly extreme of Howe island, St. Lawrence river, Frontenac Co., Ont.

**Split**; cape, Kings county, N.S. (Not Splitt.)

**Split**; lake, on Nelson river, Manitoba.

**Spong**; island, northeast of Whitney point, St. Lawrence river, Leeds county, Ont.

**Spray**; mountains and river, south of Bow river, Rocky Mountains park, Alberta.

**Spring**; cove, southwest side of entrance to Ucluelet arm, Barkley sound, Vancouver island, B.C.

**Springer**; point, on the south side of Sonora island, Coast district, B.C.

**Springhill**; settlement, west of Fredericton, York county, Ont.

**Springhill**; village, Frontenac county, Que. (Not Spring Hill.)

**Sproat**; mount, north of Upper Arrow lake, Kootenay district, B.C.

**Spruce**; river, flowing southerly into the Saskatchewan at Prince Albert, Sask. (Not Little Red.)

**Sprucegrove**; hamlet, west of Edmonton, Alberta. (Not Spruce Grove.)

**Spyglass**; mountain, southwest of Mt. Keen, Kootenay district, B.C.

*Squakum.* See Cahill.

**Squally**; reach, in southern portion of Saanich inlet, Vancouver island, B.C.

**Squamish**; pass and post office, also river entering the head of Howe sound, B.C.

**Square**; bay, east of Dominion point, Manitoulin island, Manitoulin district, Ont.

**Square**; brook, flowing into Minas channel, Kings Co., N.S. (Not Square Cove brook.)

**Square**; lake, northeast of L. La Biche, central Alberta.

*Square.* See Squire.

*Squaw.* See Brock.

**Squire**; point, on Call creek, between Johnstone strait and Knight inlet, Coast district, B.C. (Not Square.)

*Squirrel.* See Footprint.

**Srigley**; bay, south shore of Manitoulin island, Manitoulin district, Ont.

**Stafford**; rock, north of Western Duck island, Manitoulin district, Ont.

*Stainforth.* See Staniforth.

**Stake**; creek, flowing into Quiet lake, Yukon.

**Stanawan**; lake, S.W. of Dinorwic L., Kenora district, Ont. (Not Grassy River lake.)

**Stanford**; range of mountains, between Columbia and Kootenay rivers, B.C.

**Staniforth**; point, entrance to Gardner canal, Coast district, B.C. (Not Stainforth.)

**Stanley**; a spur of the Valkyr mountains, Kootenay district, B.C.

**Stanley**; island, near Summerstown, Glengarry county, Ont. (Not Craigs.)

**Stanley**; creek, tributary to Tatshenshini river, Cassiar district, B.C.

**Stanley**; village, York county, N.B. (Not Stanley Village.)

**Stanley Corners**; hamlet, Carleton county, Ont. (Not Stanley's Corners.)

**Stanley Mills**; hamlet, Peel county, Ont. (Not Stanley's Mills.)

*Stanley Village.* See Stanley.

**Stanzhikimi**; lake, west of Tawatinaw lake, Kenora district, Ont.

**Stanjikoming**; bay, Rainy lake, Rainy River district, Ont. (Not Stangekoming nor Stanjicoming.)

**Stapledon**; island, E. of Lelu I., near entrance to Inverness passage, Coast district, B.C.

**Star**; creek, branch of Hunker creek, Yukon.

**Starnesboro**; hamlet, Huntingdon county, Que. (Not Starnesborough.)

**Starr**; creek, tributary to Pelly river, between Hoole and Ketza rivers, Yukon.

**Starvation**; creek, on the international boundary, Kootenay district, B.C. (Not Akamina.)

*Starvation.* See Strawberry.

**Stave**; island, Navy group, St. Lawrence river, Leeds county, Ont. (Not Big Stave.)

**Steamboat**; mountain, between Columbia river and Frances creek, Kootenay district, B.C.

*Steamboat.* See Shawatum.

*Steel.* See Hayes.

**Steele**; town, Kootenay district, B.C. Railway station of same name 7 miles south of town. (Not Fort Steele.)

**Steep**; creek, tributary to Beaverfoot river, Rocky mountains, Kootenay district, B.C.

**Steepbank**; river, emptying into lake Claire, Alta. (Not Steep Bank nor Steep-bank.)

**Steeprock**; lake, west of Crane bay, also point, east of Peonan point, lake Manitoba, Man. (Not Steep Rock.)

**Steeprock**; river, flowing to northern end of L. Winnipegosis, Man. (Not Steep Rock.)

**Steevens**; island, north of Greene island, Manitoulin district, Ont. (Not Cariboo nor Little Green.)

*Stelako.* See Stellako.

**Stella**; village, on telegraph trail near mouth of Stellako river, Coast district, B.C.

**Stellako**; river, connecting François and Fraser lakes, B.C. (Not Stelako.)

**Stephen**; lake, north of Kakagi lake, Kenora district, Ont.

**Stephen**; mount, and railway station, Kootenay district, B.C.

*Stephens.* See Navy.

*Sterling.* See Stirling.

**Stevens**; creek, north of Whatshan lake, Kootenay district, B.C.

**Stevens**; island, Southgate group, Queen Charlotte sound, Coast district, B.C.

**Stevens**; mount, south of Wheaton river, southern Yukon.

*Stevens.* See Navy.

**Stewart**; cañon, Cascade river, Rocky Mountains park, Alberta.

**Stewart**; lake, west of Parrywood station, Kenora district, Ont.

**Stewart**; river, tributary to Yukon river, Yukon.

**Stewart**; rock, in Owen channel, Manitoulin district, Ont.

*Stewart.* See Rouyn.

*Stewart.* See Stuart.

*Stick-ah-din.* See Stikyadin.

*Stickelahn.* See Stikelan.

**Stikelan**; creek, flowing into Tatlayoko lake, Coast district, B.C. (Not Stickelahn.)

**Stikine**; river, Cassiar district, B.C. (Not Stickeen nor Stikeen, etc.)

**Stikyadin**; lake and mountains, at junction of Bulkley and Skeena rivers, Cassiar district, B.C. (Not Stick-ah-din.)

**Stimson**; creek, tributary to Highwood river, Alta. (Not S. Branch of Highwood R.)

**Stimukoktok**; cape, east shore Ungava bay, New Quebec.

**Stirling**; lake and village, southwestern Alta. (Not Sterling nor Eighteen Mile lake.)

**Stittville**; post village, Carleton county, Ont. (Not Stittsville.)

**Stockham**; island, east of Opitsat, Clayoquot sound, Vancouver island, B.C.

**Stockmer**; mount, north of Howard creek, Selkirk Mts., Kootenay district, B.C.

**Stockwell**; lake, Tp. 27, R. 8,, and Tps. 27 and 28, R. 9, W. 3 M., Saskatchewan. (Not Red Deer.)

**Stokes**; bay and river, Bruce county, Ont.

**Stone**; island, southeast of Stockham island, Clayoquot sound, Vancouver I., B.C.

*Stone.* See Mirond.

**Stoneberg**; cove, Weller bay, Prince Edward county, Ont. (Not Stoneburgh's.)

**Stonecliff**; village, Renfrew county, Ont. (Not Rockliffe.) Previous decision revised, P.O. Dept. and Ry. Co. having changed the name to avoid confusion with the well known 'Rockcliffe' at Ottawa.

*Stonehouse.* See Glengarry.

**Stoney**; creek, and Stoney Creek, village, Wentworth county, Ont. (Not Stony.)

**Stony**; creek, tributary to M'Clintock river, Yukon.

**Stony**; islet, north of Kincardine, Bruce county, Ont.

**Stony**, lake, Burleigh township, Peterborough county, Ont.

**Stony**; point, north of Corbay point, Manitoulin district, Ont.

**Stony**; point, Presqu'île bay, Brighton Tp., Northumberland Co., Ont. (Not Stoney.)

*Stony.* See Barrie.

*Stony.* See Blake.

*Stony.* See Melfort.

*Stony.* See Okemasis.

*Stony.* See Stoney.

**Stonyplain**; hamlet, west of Edmonton, Alberta. (Not Stony Plain.)

**Stoplog**; lake, Burleigh township, Peterborough county, Ont. (Not Stop Log.)

**Storm**; creek, tributary to Highwood river, Alberta.

**Storm**; mountain, north of mount Ball, Alta., and Kootenay district, B.C.

**Stormy**; lake, Glamorgan township, Haliburton county, Ont.

**Stouffville**; village, Whitchurch township, York county, Ont. (Not Stouffville Junction.)

**Stovel**; peak, south of Talaha bay, Tagish lake, Cassiar district, B.C.

**Stovin**; island, Brock group, St. Lawrence R., Leeds Co., Ont. (Not Picnic nor Refugee.)

**Straggle**; lake, Harcourt township, Haliburton county, Ont.

*Straight.* See Opinaka.

**Stranger**; lake, southwest of Kimmewin lake, Kenora district, Ont.

*Stranger.* See Mesilinka.

**Stratford**; township, Wolfe county, Que.

**Stratharbo**; settlement, Northumberland county, N.B. (Not Strathabo.)

**Strathcona**; island, west of Crooks inlet, north shore of Hudson strait, N.W.T.

**Strawberry**; island, in lake Simcoe, Ontario county, Ont. (Not Starvation.)

**Stuart**; channel, southeast coast of Vancouver island, B.C.

**Stuart**: lake and river, tributary to Nechako river, Coast district, B.C. (Not Stewart.)

**Stupart**; bay, south shore of Hudson strait, New Quebec.

*Sturgeon.* See Chalk.

*Sturgeon.* See Crémazie.

*Sturgeon.* See Namew.

*Sturgeon.* See Nemei.

**Sturgeon-weir**; river, flowing southeasterly through Amisk lake into Namew lake, Sask. (Not Sturgeon Weir.)

**Stutfield**; peak, southeast of mount Alberta, Rocky mountains, Alberta.

**Stutzer**; mount, east of Nordenskiöld river, Yukon.

*Sucker.* See Fergusson.

*Sucker.* See Garden.

*Sucker.* See Gladys.

*Sucker.* See Nemeibennuk.

*Sugar.* See Mulcaster.

**Sugarbush**; lake, Addington township, Labelle county, Que. (Not Sugar Bush.)

**Sugarloaf**; mountain, northwest of Beaver mountain, Selkirk mountains, Kootenay district, B.C.

**Sugarloaf**; mountain, near Stikine river, north of Iskut river, Cassiar district, B.C.

**Suggi**; lake, on Grassberry river, central Saskatchewan. (Not Little Pelican.)

**Sullivan**; hill, north of St. Mary river, Kootenay district, B.C.

**Sullivan**; lake, south of Battle river, Alberta. (Not Sullivan's.)

**Sullivan**; mount, east of mount Lyell, Rocky mountains, Alberta.

**Sullivan**; mount, west of Dease lake, Cassiar district, B.C.

**Sulphur**; creek, tributary to Indian river, Yukon.

**Sulphur**; mountain, south of Banff, Alberta.

*Sumac.* See Robert.

*Sumach.* See Everest.

**Sumallo**; river, tributary to Skagit river, Yale district, B.C. (Not Sumallow.)

**Sumas**; lake, river, and village, south of Fraser river, New Westminster district, B.C. (Not Sumass.)

*Sumass.* See Somass.

*Sumass.* See Sumas.

**Summit**; lake, south of Bernard lake, Cassiar district, B.C.

**Summit**; railway station, Kenora district, Ont.

*Summit.* See Sasakwei.

**Sunday**; lake, Rowell township, Kenora district, Ont.

**Sunday**; mountain, west of the north end of lake Laberge, Yukon.

**Sunday**; peak, east of Tagish lake, Cassiar district, B.C.

**Sunny Brae**; post office, Westmorland county, N.B.

**Sunshine**; creek, east of Lower Arrow lake, Kootenay district, B.C.

**Sunshine**; lake, northeast of Manitou lake, Kenora district, Ont.

**Sunwapta**; river, flowing from Wilcox pass northwesterly into Athabaska river, Alberta.

**Superior**, lake; (Fr. Lac Supérieur). The largest body of fresh water in the world and highest of the five great lakes of the St. Lawrence system.

*Supply.* See Depot.

**Surge**; narrows, easterly entrance to Okisollo channel, Coast district, B.C.

**Surprise**; lake, an expansion of the upper Broadback river, Abitibi territory, Que.

**Surprise**; lake, east of Atlin lake, Cassiar district, B.C. (Not Kusiwah.)

**Surprise**; lake, south of Onamakawash lake, Thunder Bay district, Ont.

**Surprise**; mountain, west of the north end of lake Laberge, Yukon.

**Survey**; mountain, at headwaters of Leech river, Vancouver island, B.C.

**Surveyor**; island, opp. Bucks bay, St. Lawrence R., Leeds Co., Ont. (Not Surveyor's.)

**Suskwa**; river, tributary to Bulkley river, near Hazelton, Cassiar district, B.C. (Not Bear nor Susqua.)

**Sutherland**; river, tributary to Inverness river, south of Lesser Slave lake, Alta.

**Sutil**; cape, at westerly entrance to Goletas channel, northerly coast of Vancouver island, B.C. (Not Commerell.)

**Sutton**; bay, at north end of lake Timiskaming, Nipissing district, Ont. (Not Sutton's.)

**Sutton**; lake, north of Ekwan river, Patricia, Ont. (Not Sutton Mill lake.)

**Swamp**; lake and portage, southwest of Saganaga lake, international boundary, Rainy River district, Ont.

**Swan**; island, in Columbia river, between Upper and Lower Arrow lakes, B.C.
**Swan**; lake and river, also Swan River, village, Manitoba.
**Swan**; river, flowing northerly into Lesser Slave lake, central Alberta.
*Swan.* See Garson.
**Swanson**; channel, between Moresby and Pender Is., S.E. coast of Vancouver I., B.C.
**Swanzy**; mount, also glacier, east of Mt. Bonney, Selkirk Mts., Kootenay district, B.C.
**Sweathouse**; creek, tributary to Little Smoky river, Alta. (Not Sweat House.)
**Swede**; creek, tributary to Yukon river, above Dawson, Yukon.
**Swede**; island, the largest of a group of islands on north shore of L. Superior. 3½ miles S.S.E. from Zeolite point, Thunder Bay district, Ont.
*Sweet Herb.* See Wekusko.
*Swehl-tcha.* See Cultus.
**Swell**; bay, Rainy lake, Rainy River district, Ont. (Not Sewell.)
**Swetman**; island, False Ducks islands, east end of lake Ontario, Ont.
**Swiss**; peaks, Selkirk mountains, Kootenay district, B.C.
*Sydney.* See Sidney.
**Sylvan**; lake, east of Medicine river, southern Alberta. (Not Snake.)
**Sylvia Grinnell**; river, emptying into Frobisher bay, N.W.T.
**Syndicate**; lake, west of Manitou lake, Kenora district, Ont.
**Syringa**; creek, tributary to Columbia R., S. of Lower Arrow L., Kootenay dist., B.C.

## T

*Tabasintac.* See Tabusintac.
**Tabasokwia**; river, tributary to upper Winisk river, Patricia district, Ont.
**Tabernacle**; mountain, Selkirk range, Kootenay district, B.C.
*Tabisintac.* See Tabusintac.
**Table**; mountain, Tp. 4, R. 2, W. 5 M., southern Alberta.
**Table**; mountain, at headwaters of Skeena river, Cassiar district, B.C. (Not Goat.)
*Table.* See Distingué.
**Tabusintac**; river and village, Northumberland county, N.B. (Not Tabasintac nor Tabisintac.)
**Taché**; railway station, Kenora district, Ont.
**Tachick**; lake, on telegraph trail, south of Nechako river, Coast district, B.C.
*Tacho.* See Tatsho.
**Tackle**; creek, tributary to Wild Horse river, Kootenay district, B.C.
*Tacla.* See Takla.
**Tadoussac**; township and village, Saguenay county, Que. (Not Tadousac.)
**Taggart**; creek and lake, tributary to Cowan river, central Sask. (Not Rat.)
**Tagish**; lake, east of Bennett lake, Cassiar district, B.C., and Yukon.
**Tahltan**; lake, and river tributary to Stikine river, Cassiar district, B.C.
*Tahtaloo.* See Campbell.
*Takte.* See Nisling.
**Taibi**; lake, south of Mattagami lake, Abitibi territory, Que.
**Takakkaw**; falls, Yoho river, Rocky mountains, Kootenay district, B.C.
*Takameshau.* See Eau Dorée.

**Takhini**; river, tributary to Lewes river, Yukon.

*Takipy.* See Kississing.

**Takla**; lake, north of Babine lake, Cassiar district, B.C. (Not North Tacla nor Tacla.)

**Taku**; arm of Tagish lake, Cassiar district, B.C. and Yukon.

**Taku**; river, Cassiar district, B.C.

*Taku.* See Graham.

**Talaha**; bay, in Taku arm, Tagish lake, Cassiar district, B.C.

**Talbot**; lake, Redditt township, Kenora district, Ont.

**Tallan**; lake, Chandos township, Peterborough county, Ont. (Not Tallan's.)

**Tallon**; creek, tributary to Beaverfoot R., S.E. of Leanchoil, Kootenay district, B.C.

**Taltmain**; lake, south of lower Pelly river, Yukon.

**Taltson**; river, flowing from the height of land southwesterly then northwesterly into Great Slave lake, N.W.T. (Not Copper Indian, Rocher, Rock, T'altsan nor Yellow Knife.)

*Tamagaming.* See Timagami.

**Tamihi**; creek, New Westminster and Yale districts, B.C. (Not Tamihy nor Tammeahai.)

**Tangamong**; lake, Lake township, Hastings county, Ont. (Not Tangamongue.)

**Tangier**; harbour, island, lake and town, Halifax Co., N.S., (Not Tangier Grand lake.)

**Tantalus**; butte, near confluence of Lewes and Nordenskiöld rivers, Yukon.

**Tanzilla**; river, tributary to Stikine river, Cassiar district, B.C.

*Taouagadec.* See Tawagadik.

**Tapani**; lake and river, tributary to Lièvre river, Montcalm county, Que. (Not Tapanee nor Tepanee.)

**Tar**; island, east of Rockport, St. Lawrence river, Leeds county, Ont.

**Tarte**; bay, in Kitimat arm, Coast district, B.C.

*Taseco.* See Taseko.

**Taseko**; lakes (2), and river tributary to Chilko river, Lillooet district, B.C. (Not Taseco nor Whitewater.)

*Tasheigama.* See Asheigamo.

**Tashka**; rapids, upper Winisk river, above Tabasokwia R., Patricia district, Ont.

**Tasin**; mountains, upper Stewart river, Yukon.

**Tasso**; lake, Finlayson township, Nipissing district, Ont.

*Tasurak.* See Payne.

**Tatchun**; river, tributary to Lewes river, between Rink and Five-finger rapids, Yukon. (Not Tatchum.)

**Tatei**; ridge, east of Mumm peak, Rocky mountains, Cariboo district, B.C. (Not Tatay.)

*Tatiki.* See Tattiki.

**Tatla**; lake, headwaters of Chilanko river, Coast district, B.C.

*Tatlahco.* See Tatlayako.

**Tatlayako**; river, tributary to Bellakula river, Coast district, B.C. (Not Tatlahco nor Tatlayoo.)

*Tatlayoco.* See Tatlayoko.

**Tatlayoko**; lake, west of Chilko lake, Coast district, B.C. (Not Tatlayoco.)

*Tatlayoo.* See Tatlayako.

**Tatlow**; mount, east of Chilko lake, Lillooet district, B.C.

**Tatonduk**; river, tributary to Yukon river, Yukon. (Not Tatonduc.)

**Tatshenshini**; river, tributary to Alsek river, Cassiar district, B.C. and Yukon.

**Tatsho**; creek, tributary to Tanzilla river, Cassiar district, B.C. (Not Tacho.)

**Tatsho**; mountain, Cassiar district, B.C. (Not Tacho, nor Eightmile.)

**Tattiki**; bay, in Taku arm, Tagish lake, Cassiar district, B.C. (Not Tatiki.)

**Tawagadik**; river, flowing into Matane river, Matane county, Que. (Not Taouagadec nor Towagodi.)

**Tawatinaw**; lake and river, in eastern portion of Kenora district, Ont.

**Tawatinaw**; river, flowing into Athabaska river, near Athabaska town, Alberta.

**Tawina**; creek, tributary to Silver Salmon river, Cassiar district, B.C.

**Taxes**; river, trib. to Miramichi R., York Co., N.B. (Not Taxis, Taxous nor Texas.)

*Taxis.* See Taxes.

*Taxous.* See Taxes.

**Tay**; river, tributary to Pelly river, Yukon.

**Taye**; lake, southeast of Hutshi lakes, Yukon.

**Taylor**; island, south of Port Dover, Halifax county, N.S. (Not Dover nor Taylor's.)

**Taylor**; mountain, between the east and south branches of Michel creek, Kootenay district, B.C.

**Taylor**; reef, Misery bay, Manitoulin island, Manitoulin district, Ont.

**Taysen**; lake, northwest of Ruth lake, Cassiar district, B.C.

**Tazin**; lake and river, tributary to Taltson river, N.W.T.

*Tchow-un.* See Skonun.

*Tchutetzeca.* See Tutizika.

*Tchork-back.* See Chorkbak.

**Tea**; creek, flowing northwesterly into Howser creek, Kootenay district, B.C.

**Tea**; lake, in Algonquin National park, Nipissing district, Ont.

**Teal**; lake, on Grass river, Manitoba.

**Tecumseh**; cove, Cove island, at entrance to Georgian bay, Bruce county, Ont.

**Teggau**; lake, southeast of Winnange lake, Kenora district, Ont. (Not Clearwater.)

**Tekarra**; mount, east of Athabaska R., opposite the mouth of Miette R., Alta.

**Telegraph**; creek, tributary to Stikine river, Cassiar district, B.C.

**Telegraph**; island and narrows, bay of Quinte, Hastings and Prince Edward Cos., Ont.

**Telegraph Creek**; village, Cassiar district, B.C.

**Telkwa**; river, tributary to Bulkley R. Coast district, B.C. (Not Tel-kwa nor Telqua.)

*Temagami.* See Timagami.

*Temiscaming.* See Timiskaming.

*Temiscamingue.* See Timiskaming.

*Temiskaming.* See Timiskaming.

**Tempest**; lake, south of Surprise lake, Thunder Bay district, Ont.

**Temple**; mount, east of mount Lefroy, Alberta.

**Templeman**; mount, west of Duncan river, Kootenay district, B.C.

**Templeton**; river, flowing easterly into Columbia river, about 13 miles above Galena, Kootenay district, B.C. (Not Salmon.)

*Tenants.* See Terence.

**Tenderfoot**; creek, flowing northeasterly into Lardeau river, about 3 miles below Gerrard, Kootenay district, B.C.

**Tendinenda**; lake, Mack and Scarfe townships, Algoma district, Ont. (Not Madendanada, Matinatinda nor Tendinendan.)

*Tenecape.* See Tennycape.

**Tenny**; cape, Hants county, N.S. (Not Teny.)

**Tennycape**; river and village, Hants county, N.S. (Not Tenecape nor Tenycape.)

**Ten Peaks**; valley of, east of mount Temple, Alta. (Not Desolation nor Lonely.)

**Tent**; mountain, south of Crowsnest, Alta., and Kootenay district, B.C.

*Tent.* See Peel.

*Tent Island* (shoal). See Peel.

*Teny.* See Tenny.

*Tenycape.* See Tennycape.

**Terence**; basin, bay, river and rock, also Terence Bay, post settlement; Halifax county, N.S. (Not Tenants bay, Tern bay, Turner bay nor Turnerbay rock.)

**Teresa**; island, in Atlin lake, Cassiar district, B.C. (Not Goat.)

**Terminal**; peak, Selkirk mountains, Kootenay district, B.C. (Not Green's peak.)

**Terrace**; ridge, on Porcupine river, northeast of mount Dewdney, Yukon.

**Terrahina**; creek, tributary to Nakina R., Cassiar district, B.C. (Not Terra Heena.)

**Terry**; point, at southeast entrance to Johnston harbour, Bruce county, Ont.

*Tesaycau.* See Tesekau.

**Tesekau**; lake, an expansion of the lower part of Marten river, Mistassini territory, Que. (Not Tesaycau.)

**Teslin**; lake and river, B.C. and Yukon. (Not Hootalinqua nor Teslin-too.)

*Tesse-Clewee.* See Klewi.

**Tetagouche**; river, Gloucester county, N.B. (Not Teteaguche nor Tete à Gouche.)

*Teteagouche.* See Tetagouche.

**Tête-à-la-Baleine**; post office, Céry township, Saguenay county, Que.

**Tétreauville**; hamlet, Laval county, Que. (Not Tétreaultville.)

**Tetsa**; river, flowing into Muskwa river a tributary of Fort Nelson river, Peace River district, B.C. (Not Teth-tsah.)

*Texas.* See Taxes.

**The Beehive**; mountain, west of lake Louise, Alberta.

*The Big slough.* See Alexander.

**The Bishops**; range of mountains, in the Selkirks, Kootenay district, B.C.

**The Coteau**; the eastern edge of a prairie steppe, southern Saskatchewan.

*The-cul-thi-li.* See Thekulthili.

**The Dome**; mountain, northeast of Mt. Bonney, Selkirk Mts., Kootenay district, B.C.

*The Elbow.* See Elbow.

*The Goat's Looking Glass.* See Agnes.

*The Golden Ears.* See Blanshard.

**The Grove**; village, east of London, Middlesex county, Ont.

**The Knob**; mountain, near Stikine river, north of Iskut river, Cassiar district, B.C. (Not Knob.)

**Thekulthili**; lake and river, northwest of Hill Island lake, N.W.T. (Not The-cul-thi-li.)

*The Lake.* See Cobb.

*Thelew.* See Thelon.

**Thelon**; river, tributary to Dubawnt river, N.W.T. (Not Ark-e-leenik nor Thelew.)

**The Mitre**; mountain, east of mount Lefroy, Alberta.

**The Monarch**; mountain, S.W. of Mt. Bourgeau, Rocky Mts., Kootenay district, B.C.

**The Narrows**; in South bay, Manitoulin island, Manitoulin district, Ont.

**The Needles**; narrows, Lower Arrow lake, Kootenay district, B.C.

**The Overlook**; mountain, in the Selkirks, Kootenay district, B.C.

*The Pas.* See Pas.

**The President**; mountain, north of Emerald mountain, Rocky mountains, Kootenay district, B.C. Named after the president of the Canadian Pacific Ry. Co. See also President.

**The Punts**; islands, Lake Fleet group, St. Lawrence river, Leeds county, Ont.

**The Rampart**; ridge, between Mt. Afton and "The Dome," Selkirk Mts., B.C.

**The Ridge**; bar, in Owen channel, Manitoulin district, Ont.

**Thérien**; lakes, in eastern Alberta.

*The Saddle.* See Saddle.

**The Steeples**; mountains, east of Kootenay river, Kootenay district, B.C.

*The Stragglers.* See Wenkchemna.

**Thetford**; river, township and village, Megantic county, Que. (Not Thetford Mines, station and village.)

**The Three Guardsmen**; mountains, south of Aishihik lake, Yukon.

**Thetis**; island, north of Kuper island, southeast coast of Vancouver I., B.C.

*The Twins.* See Twin peaks.

**The Vice President**; mountain, President range, Rocky mountains, Kootenay district, B.C. (Not Angle peak.) Named after the vice-president of the C.P.R. Co.

**The Wart**; hill, at mouth of Koksoak river, New Quebec.

**Thibault**; shoal, south of Manitoulin island, Manitoulin district, Ont.

**Thibert**; creek, flowing into the northern end of Dease lake, Cassiar district, B.C.

**Thickwood**; hills, central Saskatchewan.

**Thirty-one-mile**; lake, Ottawa and Labelle counties, Que. (Not Grand Lac du Commissaire.)

**Thistle**; creek, tributary to Yukon river, above White river, Yukon.

**Thistle**; reef, in Portage bay, Manitoulin island, Manitoulin district, Ont.

*Thleweechodezeth.* See Backs.

**Thom**; mount, north of Dartmouth, Halifax county, N.S. (Not Tom.)

**Thomas**; bay and point, near South Baymouth, Manitoulin district, Ont.

**Thomas**; river, emptying into the northern end of Frances L., Yukon. (Not Too-tlas.)

*Thomas Green.* See Tommy.

*Thomasine.* See Tomasine.

**Thompson**; cove, east of cape Spencer, St. John county, N.B.

**Thompson**; creek, tributary to Watson river, southern Yukon.

**Thompson**; lake, northwest of lac La Croix, Rainy River district, Ont.

**Thompson**; mount, northwest of Bow lake, Alberta. (Not Thompson's.)

**Thomson**; lake, Lake township, Hastings county, Ont. (Not Thomson's.)

**Thor**; mount, west of Upper Arrow lake, Kootenay district, B.C.

*Thorn.* See Maple.

**Threefork**; river, flowing into Wabigoon lake, Kenora district, Ont. (Not Three Fork.)

**Threehills**; creek, north of Kneehills creek, Alberta. (Not Three Hills.)

**Threemile Plains**; village, Hants county, N.S. (Not Three Mile Plains.)

**Threemount**; bay and point, east of McIntyre bay, lake Nipigon, Thunder Bay district, Ont. (Not Three Mount nor Three Mountain.)

**Threepoint**; creek, tributary to Sheep river, also mountain, southern Alberta.

**Threepoint**; lake, on Burntwood river, Manitoba. (Not Nistowasis.)

**Three Sisters**; mountain peaks, south of Canmore, Rocky Mountains park, Alberta.

*Thron-diuck.* See Klondike.

**Thrumcap**; shoal, at entrance to Halifax harbour, Halifax county, N.S.

*Thumb.* See Galena.

**Thunder**; bay, and cape at east entrance to the bay, Thunder Bay district, Ont.

**Thunder**; creek, flowing into Pelican lake, southern Saskatchewan.

**Thunderhill**; ranching settlement, west side of Columbia lake, Kootenay district, B.C. (Not Thunder Hill.)

**Thunder**; lake, north of Wabigoon lake, Kenora district, Ont.

**Thurlow**; township, Hastings county, Ont.

*Thustetzeca.* See Tutizika.

**Thutade**; lake, headwaters of Finlay river, Cassiar district, B.C. (Not Thudade nor Thutage.)

**Thwartway**; island, Admiralty group, St. Lawrence river, Leeds county, Ont. (Not Leak nor Leek.)

*Tiahn.* See Tian.

**Tian**; point, Graham island, Queen Charlotte Is., Coast district, B.C. (Not Tiahn.)

*Ticouabi.* See Tikuape.

**Tidds**; island, Admiralty group, St. Lawrence river, Leeds county, Ont.

**Tide**; lake, English river, below Maynard lake, Kenora district, Ont.

**Tide**; rock, Southgate group, Queen Charlotte sound, Coast district, B.C.

*Tiernan.* See Ogoki.

**Tiger**; brook, tributary to rivière des Quinze, Timiskaming county, Que.

**Tigonankweine**; range of mountains, Gravel R., N.W.T. (Not Tigenankwene.)

*Tikonabi.* See Tikuape.

**Tikuape**; post office and river, Lake St. John county, Que. (Not Ticouabi, Tikonabie, Tikouabi, Tikouape nor Tikouapee.)

*Til-e-i-tsho.* See Tillei.

**Tillei**; lake, north of Frances lake, Yukon. (Not Til-e-i-tsho.)

**Tilley**; mount, east of Mt. Mackenzie, Kootenay district, B.C.

**Tillsonburg**; town, Oxford county, Ont.. (Not Tilsonburg.)

**Tilted**; mountain, west of Lychnis mountain, Rocky mountains, Alberta.

**Timagami**; lake, Nipissing district, Ont. (Not Tamagaming nor Temagami.)

**Timber**; bay, and Timber Bay shoal, S. shore of Manitoulin I., Manitoulin dist., Ont.

**Timber**; island, False Ducks islands, eastern portion of lake Ontario, Ont.

**Timiskaming**; lake, Timiskaming, Ontario and Quebec. (Not Temiscaming, Temiscamingue nor Temiskaming.)

**Tinson**; point, Gabriola island, strait of Georgia, B.C. (Not Rocky.)

**Tintina**; valley, central Yukon. A great depression occupied successively by Pelly, Kalzas, Stewart and Klondike rivers, and extending to the Yukon.

**Tisiriuk**; lake, emptying into Leaf river, New Quebec. (Not Seal.)

**Titkana**; peak, northeast of mount Robson, Rocky mountains, Cariboo district, B.C. (Not Ptarmigan.)

*Tlet-tlan-a-tsoots.* See Finlayson.

*Toba.* See Toby.

**Tobermory**; harbour and village, at northwest extreme of Saugeen peninsula, Bruce county, Ont.

**Tobey**; point, west side of Prince Rupert harbour, Coast district, B.C.

**Tobique**; river, tributary to St. John river, from Nictor lake, Restigouche and Victoria counties, N.B. The names 'Nictor' and 'Little Tobique,' applied to that portion of the river above 'the forks,' to be discarded.

*Tobique.* See Trousers.

**Toby**; creek, flowing easterly into Columbia river, at Athalmer, Kootenay district, B.C. (Not Toba.)

**Tod**; creek and inlet, Saanich inlet, Vancouver island, B.C.

**Todman**; reef, at mouth of Thomas bay, Manitoulin island, Manitoulin district, Ont.

*Todnustook.* See Tulnustuk.

**Tofino**; inlet, also townsite on Low peninsula, Clayoquot sound, Vancouver I., B.C.

**Tokumm**; creek, south of Deltaform mountain, Kootenay district, B.C.

**Tolmie**; reef, between Kincardine, and Clark point, Bruce county, Ont.

*Tom.* See Thom.

**Tomasine**; river, Pontiac county, Que. (Not Thomasine nor Tomassino.)

**Tombstone**; mountain, northeast of Kananaskis lakes, southern Alberta.

**Tomkinson**; point, Ursula channel, Coast district B.C. (Not Tomkinsin.)

**Tomlinson**; point, Blunden harbour, Queen Charlotte sound, Coast disrtict, B.C.

**Tommy**; creek, tributary to Bridge river, from the south, Lillooet district, B.C. (Not Green, Thomas Green nor Tommy Green.)

**Tongue**; creek, flowing easterly into Highwood river, southern Alberta. (Not Tongue-flag.)

**Tonkawatla**; river, tributary to Columbia R., Kootenay dist., B.C. (Not Tonca Watla.)

*Toochi.* See Tutshi.

**Too-flat**; creek, tributary to Klondike river, Yukon.

*Toohoolitas.* See Tuhulitas.

*Toolnustook.* See Tulnustuk.

**Too-much-gold**; creek, tributary to Klondike river, Yukon.

*Toonkwa.* See Tunkwa.

*Tootizeca.* See Tutiziku.

*Too-tlas.* See Thomas.

*Tooya.* See Tuya.

**Topham**; mount, southeast of Mt. Macoun, Selkirk mountains, Kootenay district, B.C.

**Torch**; lake, southwest of Candle lake, central Saskatchewan. (Not Little Candle.)

**Torch**; river, tributary to Saskatchewan river, eastern Sask. (Not Big Sturgeon.)

*Tornait.* See Newton.

*Torrent.* See St. Mary.

**Torres**; channel, between Teresa and Copper islands and west shore of Atlin lake, Cassiar district, B.C. (Not West channel, Torres straits nor Tory inlet.)

**Tortue**; river, Saguenay county, Que. (Not Fall.)

*Tortue.* See Orme.

*Tory.* See Torres.

**Totogan**; lake, north of Kanuchuan river, upper Winisk river, Patricia district, Ont.

**Touchwood**; hills, southern Saskatchewan.

**Toussaint**; island, above Iroquois point, St. Lawrence river, Dundas county, Ont. (Not Tousaint's, Toussaint's nor Toussons.)

*Toussons.* See Toussaint.

*Towagodi.* See Tawagadik.

**Tower**; creek, tributary to St. Mary river, Kootenay district, B.C.

**Tower**; peak, north of Quiet lake, Yukon.

**Tower of Babel**; mountain, east of Moraine lake, southern Alberta

**Towincut**; creek and mountain, S. of Cowichan L., Vancouver I., B.C. (Not Nixon.)

**Toyehill**; village, Dundas county, Ont. (Not Toy's Hill.)

**Tracy**; creek and hamlet, east of Kootenay river, north of Steele, Kootenay district, B.C.

**Trade**; lake, on Churchill river, above Reindeer river, Sask. (Not Island lake.)

**Trading**; lake, Ridout township, Muskoka district, Ont.

**Traffic**; mountain, north of Pelly lakes, Yukon.

*Trail.* See Chungo.

**Tramping**; lake, between Reed and Wekusko lakes, western Manitoba. (Not Sandy.)

**Tramping**; lake, southwest of Battleford, Sask.

*Tranquille.* See Bridge.

**Trap**; mountain, west of Sooke river, Vancouver island, B.C.

**Trapper**; creek, tributary to Westkettle river, Similkameen district, B.C. (Not E. fork of W. fork of Kettle river.)

**Travers** (lac de); lake, at headwaters of St. Maurice river, Champlain county, Que.

**Traverse**; bay, mouth of Winnipeg river, Manitoba.

**Traverse**; lake, Storrington township, Frontenac county, Ont. (Not Little Cranberry.)

**Tremayne**; bay, in southern portion of Digby island, Coast district, B.C.

**Trent**; river, flowing into the bay of Quinte at Trenton, Hastings and Northumberland counties, Ont.

**Trenton**; town, at western end of the bay of Quinte, Hastings county, Ont.

**Trepanege**; plateau and river, west of Okanagan lake, Osóyoos district, B.C. (Not Deep creek nor Trepanier river.)

*Trepanier.* See Trepanege.

**Triangle**; lake, southeast of lake Nipigon, Thunder Bay district, Ont.

**Trident**; mountain, southwest of Kinbasket lake, Kootenay district, B.C.

**Trident**; point, on north shore of the bay of Quinte, Hastings Co., Ont. (Not Long.)

**Trincomali**; channel, between Galiano and Saltspring islands, southeast coast of Vancouver island, B.C. (Not Trincomalee nor Trincomalie.)

**Trivet**; point, Princess Royal island, Coast district, B.C.
**Trodely**; island, north of Charlton island, James bay, N.W.T. (Not Little Charlton.)
*Trois Bras.* See Holden.
**Trolltinder**; mountain, south of mount Balfour, Kootenay district, B.C.
**Troughton**; island, Lake Fleet group, St. Lawrence river, Leeds county, Ont.
**Trousers**; lake, Lorne parish, Victoria county, N.B. (Not Tobique.)
**Trout**; creek, branch of McDame creek, Dease river, Cassiar district, B.C.
**Trout**; lake at head of Lardeau river, Kootenay district, B.C.
*Trout.* See Buntzen.
*Trout.* See Crean.
*Trout.* See Hayes.
*Trout.* See Peerless.
**Truax**; creek, tributary to Bridge river, from the south, Lillooet district, B.C. (Not Truaxe.)
**Truda**; peaks, Hermit range, Selkirk mountains, Kootenay district, B.C.
**Tsetelui**; lake, at headwaters of Kakuchuya R., Cassiar district, B.C. (Not Tseteloui.)
*Tshensagi.* See Chensagi.
**Tsichu**; river, tributary to Gravel river, N.W.T. (Not Tsi-Choo.)
*Tsinkut.* See Sinkut.
**Tsu**; lake, an expansion of Taltson river, N.W.T.
**Tuck**; inlet, narrows and point, north of Prince Rupert harbour, B.C. (Not Tuck's.)
**Tucker**; creek and lake, emptying into Allumette bay, Renfrew county, Ont.
*Tudjakdjuan.* See Resolution.
*Tudjakdjudusirn.* See Gabriel.
**Tugwell**; creek, west of Otter point, Juan de Fuca strait, Vancouver island, B.C.
**Tuhulitas**; inlet, north of Cyrus Field bay, N.W.T. (Not Toohoolitas.)
**Tulameen**; mountain, river and village, Yale district, B.C. (Not Tulameen city.)
**Tulip**; creek, east of Lower Arrow lake, Kootenay district, B.C.
**Tullin**; mountain, west of outlet of Chilko L., Coast district, B.C. (Not Tull-in.)
**Tulnustuk**; river, Saguenay county, Que. (Not Todnustook nor Toolnustook.)
*Tummeahai.* See Tamihi.
**Tummel**; river, tributary to Pelly river, Yukon.
**Tun**; island, Blind bay, Halifax county, N.S. (Not Tuns.)
**Tunagamik**; lake, at headwaters of Ottawa river, Joliette county, Que.
**Tunkwa**; lake, Tp. 19, R. 21, W. 6 M., Kamloops district, B.C. (Not Toonkwa.)
**Tunnussaksuk**; point, east shore of Ungava bay, New Quebec.
**Tupper**; mount, also glacier in the Selkirks, Kootenay district, B.C.
*Turn.* See Dryad.
**Turnagain**; point, at entrance to Lynx bay, L. Winnipeg, Man. (Not Saskatchewan.)
**Turner**; mount, east of Stikine river and north of Iskut river, Cassiar district, B.C.
*Turner.* See Terence.
*Turner.* See Whitehorn.
*Turnerville.* See Ennett.
**Turning**; island, near S. point of Cove I., entrance to Georgian bay, Bruce Co., Ont.
**Turquoise**; lake, east of mount Balfour, Alberta.

**Turret**; mountain, Tp. 4, R. 2, W. 5 M., Alberta. (Not Castle.) To avoid duplication of the name "Castle" previously confirmed for the mountain north of Castle station.

**Turret**; peak, between Adamant and Austerity mountains, Adamant range of the Selkirks, Kootenay district, B.C.

**Turtle**; mountain, south of Frank, southwestern Alberta.

**Turtle**; mountain, southwestern Manitoba.

**Turtle**; point, on northerly portion of Gil island, Coast district, B.C.

*Turtle.* See Jarvis.

**Tuscarora**; village, Brant Co., Ont. (Not Middleport.)

**Tusket**; island and village, Yarmouth county, N.S. (Not Great Tusket island.)

*Tusket Wedge.* See Wedgeport.

**Tustles**; lake, north of Frances lake, Yukon. (Not Tus-tles-tu.)

*Tutchi.* See Tutshi.

**Tutesheta**; creek, tributary to Tahltan river, Cassiar district, B.C. (Not Tuteshita.)

**Tutizika**; river, the south branch of Mesilinka river, Cassiar district, B.C. (Not Tchutetzeca, Thustetzeca nor Tootizeca.)

**Tutizzi**; lake, an expansion of Tutizika river, Cassiar district, B.C.

**Tutshi**; lake and river, S.E. of Bennett L., Cassiar dist., B.C. (Not Toochi nor Tutchi.)

**Tuttle**; point, at entrance to Stupart bay, Hudson strait, New Quebec.

**Tuvalik**; Indian village, west coast of Ungava bay, New Quebec.

**Tuya**; lake, and river tributary to Stikine river, Cassiar district, B.C. (Not Tooya.)

**Tuzo**; mount, east of Deltaform mountain, Bow range of the Rockies, Alta. and B.C.

*Twelve Mile.* See Bronte.

**Twelve O'clock**; point, at the eastern entrance to Murray canal, Murray township, Northumberland county, Ont.

*Twenty Mile.* See Hedley.

*Twenty-five Mile.* See Harvey.

**Twilight**; lake, southwest of Cliff lake, Kenora district, Ont.

**Twin**; butte and creek, near Twin Butte railway station, Kootenay district, B.C.

**Twin**; falls, on the upper part of Yoho river, Kootenay district, B.C.

**Twin**; peaks, north of Columbia glacier, Rocky mountains, Alta. (Not The Twins.)

*Twin.* See Dunsmuir.

*Twin.* See Vrooman.

**Twin Sisters**; islands, Brock group, St. Lawrence river, Leeds county, Ont.

**Twitya**; river, tributary to Gravel river, N.W.T. (Not Twityeh.)

**Two-bit**; creek, east of Lower Arrow lake, Kootenay district, B.C.

**Two Rivers**; lake of, Algonquin National park, Nipissing district, Ont.

**Tyaughton**; mountains, also creek flowing into Bridge river, Lillooet district, B.C.

**Tyee**; lake and telegraph station, on trail near Bulkley river, Cassiar and Coast districts, B.C. (Not Long.)

**Tyendinaga**; township, Hastings county, Ont.

**Tyers**; river, tributary to Frances river, near Frances lake, Yukon.

**Tyne**; point, Departure bay, east coast of Vancouver island, B.C.

**Tyrrell**; lake, Tp. 5, Rs. 17 and 18, W. 4th M., southern Alberta. (Not Tyrrell's.)

**Tzuhalem**; mountain and post settlement, north of Cowichan river, Vancouver island, B.C. (Not Tzouhalem.)

## U

*Uibvaksoak.* See Uinaksoak.

**Uinaksoak**; cape, east shore of Ungava bay, New Quebec. (Not Uibvaksoak.)

**Unahini**; river, tributary to Tatshenshini river, Yukon.

*Unaminnikan.* See Manomin.

**Ungava**; bay, Hudson strait, New Quebec.

**Unger**; island, bay of Quinte, mouth of Napanee R., Lennox Co., Ont. (Not Unger's.)

**Union**; bay, east side of Saanich inlet, Vancouver island, B.C.

**Unwin**; mount, southwest of the narrows of Maligne lake, Rocky mountains, Alta.

**Uphill**; lake, northeast of Manitou lake, Kenora district, Ont. (Not Moonshine nor Kasakacheweiwak.)

**Upika**; river, tributary to Chicoutimi river, Montmorency county, Que. (Not Upsika.)

*Upikauba.* See Pikauba.

*Upinnakaw.* See Opinnagau.

**Upper Arrow**; lake, an expansion of Columbia river, Kootenay district, B.C.

*Upper Bow.* See Bow.

*Upper Clearwater.* See Hobson.

*Upper Emerald.* See Yoho.

*Upper Fishing.* See Qu'Appelle.

*Upper Gull.* See Chensagi.

*Upper Kootanie.* See Duncan.

**Upper Lahave**; village, Lunenburg county, N.S. (Not Upper La Have.)

*Upper Manitou.* See Anzhekumming.

*Upper Nicola.* See Nicola.

**Upper Rock**; lake, Storrington township, Frontenac county, Ont. (Not Blunder.)

**Upper Savage**; islands, east of Big island, Hudson strait, N.W.T. (Not Savage.)

*Upper White Fish.* See Jarvis.

*Upsika.* See Upika.

**Urd**; a peak of the Valhalla mountains, Kootenay district, B.C.

**Ursula**; channel, east of Gribbell island, Coast district, B.C.

**Ursus Major**; mountain, Hermit range, Selkirk mountains, Kootenay district, B.C.

**Ursus Minor**; mountain, Hermit range, Selkirk mountains, Kootenay district, B.C.

**Usatzes**; point, N.E. point of Low peninsula, Clayoquot sound, Vancouver I., B.C.

**Uto**; peak, near mount Sir Donald, Selkirk mountains, Kootenay district, B.C.

**Uztlius**; river, tributary to Anderson river, Yale district, B.C. (Not Uz-tli-hoos nor Uzvioos.)

## V

**Vadso**; rock, off the southwest point of Larcom island, Observatory inlet, Cassiar district, B.C.

**Val-Brillant**; post office, Matane county, Que. (Not Val Brillant.)

**Valdes**; island, in the southern portion of the strait of Georgia, B.C.

*Valdes.* See Maurelle, Quadra and Sonora. Recent surveys proved that the name Valdes covered three islands, which have been named separately as above, and the former name has been discarded to avoid duplication.

**Valhalla**; mountains, west of Slocan lake, Kootenay district, B.C. (Not Val Halla.)

**Valkyr**; mountains, east of Lower Arrow lake, Kootenay district, B.C. (Not Valkyriur.)

**Valley**; river, flowing easterly into Dauphin lake, Manitoba.

**Valleyview**; hamlet, north of Wapella, Sask. (Not Valley View.)

**Valois**; village, Jacques Cartier county, Que. (Not Valoisville.)

*Valoisville.* See Valois.

**Vananda**; cove and post settlement, Texada island, strait of Georgia, B.C. (Not Van Anda.)

**Van Buren**; island, northeast of Tar island, St. Lawrence river, Leeds county, Ont.

**Vancouver**; creek, tributary to McQuesten river, Yukon.

*Van Hooven.* See Van Houten.

**Van Horne**; brook, glacier, névé and range of mountains, Kootenay district, B.C.

**Van Houten**; creek, E. of Lower Arrow L., Kootenay district, B.C. (Not Van Hooven.)

**Vankoughnet**; bay, east of The Narrows, L. Manitoba, Man.

**Vansittart**; island, northeast of Grenadier island, St. Lawrence river, Leeds Co., Ont.

**Vaudray**; lake, Vaudray township, Timiskaming county, Que. (Not Long.)

**Vaudreuil**; bay, rapids and village, also Vaudreuil Station, post office, Vaudreuil county, Que. (Not Dorion.)

**Vaux**; mount, also glacier, northeast of Leanchoil station, Kootenay district, B.C.

**Vedder**; mountain, international boundary, New Westminster district, B.C.

**Venn**; passage between Metlakatla bay and Prince Rupert harbour, Coast district, B.C.

**Ventadour**; lake, Quebec county, Que. (Not Kakisksagamak.)

**Ventego**; mountain, Selkirk range, Kootenay district, B.C.

**Vents** (rivière des); river, tributary to Laird river, east of Rabbit river, Cassiar district, B.C.

**Verdigris**; coulée and lake, north of Milk river, southern Alberta.

**Vermilion**; bay and railway station, Eagle L., Kenora district, Ont. (Not Vermillion.)

**Vermilion**; range of mountains, between Kootenay and Vermilion rivers, and north of Mitchell range, Kootenay district, B.C.

**Vermilion**; river, flowing southerly into the upper Kootenay river, Kootenay district, B.C.

*Vermilion.* See Little Vermilion.

*Vermilion.* See Pink.

*Vermilion.* See Red.

**Verney**; passage, between Hawkesbury and Gribbell islands, Coast district, B.C.

**Vernon**; creek and lake, at headwaters of Nimpkish river, Vancouver island, B.C.

**Vertebrae**; mountain, north of Bush river, Rocky Mts., Kootenay district, B.C.

**Verte-Vallée**; hamlet, Vaudreuil county, Que. (Not Green Valley.)

**Vertical**; mountain, east of Kootenay river, Kootenay district, B.C.

**Vesuvius**; bay, Saltspring island, southeast coast of Vancouver island, B.C.

*Vicontent.* See Auneuse.

**Victor**; island, in Muchalat arm of Nootka sound, Vancouver island, B.C.

**Victoria**; island, Brock group, St. Lawrence river, Leeds county, Ont. (Not Mile.)

**Victoria**; island, N.W.T. Portions of this island have been known as "Victoria land," "Prince Albert land" and "Wollaston land."

**Victoria**; mount, also glacier, in the Bow range of the Rockies, Alta., and Kootenay district, B.C. (Not Mt. Green.)

**Victoria**; peak, northwest of Crown mountain, Vancouver island, B.C.

*Victoria.* See Broadback.

**Vidette**; peak, Sir Sandford range, Selkirk mountains, Kootenay district, B.C.

**Vigilant**; island, on north side of Prince Rupert harbour, B.C. (Not Bacon.)

**Vigilant**; rock, east of Grantham shoals, Manitoulin island, Manitoulin district, Ont.

*Village Bélanger.* See Bélanger.

*Village Richelieu.* See Richelieu.

**Villanova**; post office, Norfolk county, Ont. (Not Villa Nova.)

**Villemontel**; river, tributary to Kinojevis river, Timiskaming county, Que. (Not Nawapitechin.)

**Vingolf**; mount, west of Slocan lake, Kootenay district, B.C.

**Violadale**; village, Marquette electoral district, Man. (Not Viola Dale.)

*Vitcontent.* See Auneuse.

**Voisin** (lac); lake, northeast of Taggart lake, central Saskatchewan.

**Volcano**; creek, tributary to Sheep river, southern Alberta.

**Volunteer**; spit, between Birch and Walker points, Manitoulin I., Manitoulin dist., Ont.

**Von Wilczek**; valley, on Lewes river, above Pelly river, Yukon.

**Vowell**; creek, tributary to Bobbie Burns creek, Kootenay district, B.C. (Not South Fork of Middle Fork of Spillimacheen river.)

**Vowle**; mount, west of Schwatka river, southern Yukon.

**Vrooman**; islands, MacGregor cove, Bruce county, Ont. (Not Twin.)

**Vulture**; col, between mounts Gordon and Olive, Rocky mountains, Alberta.

*Vulture.* See Winnange.

## W

*Waagan.* See Wagan.

*Waagoosh.* See Waugush.

**Wabakimi**; lake, northwest of Smoothrock lake, Thunder Bay district, Ont.

**Wabamun**; lake, south of St. Ann, central Alberta. (Not White Whale.)

**Wabanoni**; river, emptying into Obaska lake, Timiskaming Co., Que. (Not Wabinoni.)

*Wabasca.* See Wabiskaw.

*Wabaskoutyunk.* See Kempt.

**Wabaskus**; lake, southeast of Abitibi lake, Timiskaming county, Que.

**Wabassi**; brook, Templeton township, Ottawa county, Que.

**Wabi**; bay and creek, at the head of lake Timiskaming, Ont.

**Wabigoon**; lake, river and village, Kenora district, Ont. (Not Wabigwunn.)

*Wabigwunn.* See Wabigoon.

*Wabinoni.* See Wabanoni.

**Wabinosh**; bay, lake, and river, on west side of L. Nipigon, Thunder Bay district, Ont.

**Wabishkok**; lakes, south of Kisseynew lake, Manitoba.

**Wabiskaw**; lakes and river, tributary to Peace river, northern Alberta. (Not Loon river, nor Wabascan nor Wabiscaw lakes.)

**Waddell**; bay, Frobisher bay, N.W.T. (Not Dyer sound.)

**Wadopi**; brook, tributary to upper Winisk river, Patricia district, Ont.

**Wadsworth**; lake, Tudor township, Hastings county, Ont.

**Wagabkedei**; lake, northwest of Attawapiskat lake, Patricia district, Ont.

**Wagan**; river, tributary to Restigouche R., Madawaska Co., N.B. (Not Waagan.)

**Wagner**; mountain, west of Duncan river, Kootenay district, B.C.

**Wagosh**; bay and reef, Cockburn island, Manitoulin district, Ont. (Not Wahgoosh.)

*Wagwabeya.* See Wagwabika.

**Wagwabika**; lake, headwaters of Lièvre R., St. Maurice Co., Que. (Not Wagwabeya.)

*Wahbiquekobing.* See Wakwekobi.

*Wahcomatagaming.* See Wakomata.

*Wahgoosh.* See Wagosh.

*Wahnapitae.* See Wanapitei.

*Wahquekobing.* See Wakwekobi.

*Wahwanichi.* See Wakonichi.

**Waiatt**; bay, Okisollo channel, Coast district, B.C. (Not Wi-yat nor Wyatt.)

*Wai-nusk.* See Winisk.

**Wainwright**; basin, between S.E. end of Kaien I. and mainland, Coast district, B.C.

**Waitabit**; creek, flowing into Columbia river below Donald, Kootenay district, B.C.

*Wajabakoute.* See Chartier.

*Wakamagaming.* See Wakami.

**Wakami**; lake, river and Ry. station, Sudbury district, Ont. (Not Wakamagaming.)

*Wakaumekonke.* See Normand.

**Wakaw**; lake, northwest of Basin lake, central Saskatchewan. (Not Crooked.)

**Wakeham**; bay, southwest of Wales sound, Hudson strait, New Quebec.

*Wakinichi.* See Wakonichi.

**Wakomata**; lake, north of Gould township, Algoma district, Ont. (Not Clear nor Wahcomatagaming.)

**Wakonichi**; lake, south of Mistassini lake, Mistassini territory, Que. (Not Wahwanichi nor Wakinichi.)

**Wakwekobi**; lake, Day township, Algoma district, Ont. (Not Wahbiquekobing nor Wahquekobing.)

**Walbran**; point, north end of Loretta island, Devastation channel, Coast district, B.C.

**Wales**; cape, island and sound, south shore of Hudson strait, N.W.T. (Not Prince of Wales.)

**Walkem**; islands, Johnstone strait, Coast district, B.C. (Not Pender.) This name adopted to avoid duplication, there being a Pender island further south.

**Walker**; creek, north of Sixtymile river, near international boundary, Yukon.

**Walker**; hamlet, Middlesex county, Ont. (Not Walker's.)

**Walker**; mount, north of Blaeberry, river, Rocky mountains, Kootenay district, B.C.

**Walker**; point, south shore of Manitoulin island, Manitoulin district, Ont.

**Walkhouse**; bay and point, northeast of Inner Duck island, Manitoulin district, Ont.

**Wallace**; island, east of Lynedoch island, St. Lawrence river, Leeds county, Ont.

**Wallace**; island, N. of Saltspring I., S.E. coast of Vancouver I., B.C. (Not Narrow.)

**Wallace**; mount, southeast of Beaverdell, Similkameen district, B.C.

**Wallace**; mount, also river, south of Lesser Slave lake. central Alberta.

**Wallace**; rock, near South Baymouth, Manitoulin district, Ont.
**Wallbridge**; point, Ameliasburg township, Prince Edward county, Ont.
**Wallenger**; creek, tributary to Wild Horse river, Kootenay district, B.C.
**Wall-eye**; lake, south of Eagle lake, Kenora district, Ont.
**Wallis**; point, Nanoose harbour, east coast of Vancouver island, B.C.
**Walsh**; lake, north of Rosamond lake, Kenora district, Ont.
**Walters**; point, north shore of Okisollo channel, Coast district, B.C.
**Walton**; river and village, Hants county, N.S. (Not La Tete nor Petite.)
*Wamilkaszibic.* See Briand.
**Wanapitei**; lake, Ry. station and river, Sudbury district, Ont. (Not Wahnapitae.)
**Wanderer**; shoal, southwest of Lyal island, Bruce county, Ont.
**Wanipigow**; river, emptying into the east side of lake Winnipeg, Man. (Not Hole.)
**Wanogu**; lake, Ledger township, Thunder Bay district, Ont. (Not Wanogooh.)
**Wapageisi**; lake, east of Anzhekumming lake, Kenora district, Ont.
*Wapateehk.* See Waputik.
**Wapawekka**; lake and range of hills, southeast of L. La Ronge, central Saskatchewan. (Not Bear lake nor Great Bear Sand hills.)
**Wapiabi**; creek, tributary to South branch of Brazeau river, Alta. (Not Grave.)
*Wapichtigow.* See Wapishtigau.
*Wapikik.* See Kapikik.
**Wapikopa**; lake and river, upper waters of Winisk river, Patricia district, Ont.
**Wapishtigau**; brook, tributary to Burntwood river, Manitoba. (Not Wapichtigow.)
**Wapiti**; river, tributary to Smoky river, central Alberta.
**Wapitotem**; river, between Attawapiskat and Weibikwei lakes, Patricia district, Ont.
*Wapoos.* See Wapus.
*Wapoose.* See Wapus.
**Wapta**; glacier, lake and mountain, Rocky mountains, Kootenay district, B.C.
*Wapta.* See Cataract.
*Wapta.* See Kicking Horse.
*Wapta.* See Yoho.
**Wapus**; lake and river, east side of Reindeer lake, central Sask. (Not Wapoos.)
**Wapus**; lake and river, N.W. of Kakagi lake, Kenora district, Ont. (Not Wapoose.)
**Wapusanan**; lake, north of Grand lake Victoria, Timiskaming county, Que.
**Wapustagamu**; lake, on west branch of St. Augustin river, Saguenay county, Que. (Not Wapustagamoo.)
**Waputik**; mountains and snowfield, Rocky mountains, Kootenay district, B.C. (Not Wapateehk, Wap-ut-teehk, Waputehk nor Waputehk.)
**Ward**; bay, Aylmer lake, Wolfe county, Que. (Not Ward's.)
**Ward**; inlet, Frobisher bay, N.W.T. (Not A. H. Ward.)
**Ward**; lake, Rattray township, Timiskaming district, Ont.
**Ward**; mount, south of Wheaton river, southern Yukon.
**Wardner**; village, on Kootenay river, south of Bull river, Kootenay district, B.C.
**Ware**; creek, tributary to Sheep river, southern Alberta.
**Ware**; mount, northwest of mount Hoffman, southern Alberta.
**Wark**; channel and island of Tsimpsean peninsula, Coast district, B.C. (Not Work.)

**Wark**; island, northeast of Princess Royal island, Coast district, B.C. (Not Warke.)

**Wark**; mount, near head of Saanich inlet, Vancouver island, B.C. (Not Big Saanich nor Work.)

**Wark**; point, in Victoria harbour, B.C. (Not Work.)

**Warner**; bay and point, east of Hopkins point, Bruce county, Ont.

**Warpath**; river, emptying into the west side of L. Winnipeg, Man. (Not War Path.)

**Warren**; island, south of Beament island, Bruce county, Ont.

**Warren**; mount, south of southeast end of Maligne lake, Rocky mountains, Alberta.

**Warwick**; cape, east of Resolution island, N.W.T. (Not Resolution.)

**Wasawakasik**; lake, on Churchill river, below Nemei river, Sask.

*Wascana.* See Waskana.

**Washademoak**; river, tributary to St. John river, Queens county, N.B. (Not Washademoac nor Washedemoak.)

**Washagami**; river, tributary to Ekwan river, Patricia district, Ont. (Not Washegummy.)

**Washagomis**; lake, south of Shabumeni lake, Patricia district, Ont. (Not Lower Clearwater.)

*Washedemoak.* See Washademoak.

*Washegummy.* See Washagami.

**Washeibemaga**; lake, southeast of Boyer lake, Kenora district, Ont. (Not Kawasheibemagagamak.)

**Washeka**; lake, upper Ottawa river, Pontiac county, Que. (Not Waskega.)

**Washi**; lake, Albany river, east of Makokibatan lake, Patricia district, Ont. (Not Lake of the Narrows.)

**Washikuti**; bay and river, Saguenay county, Que. (Not Washsheecootai.)

**Washimeska**; river, Lake St. John county, Que. (Not Ouasiemska nor Wassienska.)

**Washmawapta**; glacier, E. of Helmet mountain, Rocky Mts., Kootenay district, B.C.

**Washow**; bay, in southern portion of lake Winnipeg, Manitoba.

*Washsheecootai.* See Washikuti.

**Waskahigan**; river, tributary to Little Smoky river, Alberta.

*Waskaiowaka.* See Waskatowaka.

**Waskana**; creek, flowing N.W. past Regina into Qu'Appelle R., Sask. (Not Wascana.)

**Waskatowaka**; lake, at headwaters of Little Churchill R., Man. (Not Waskaiowaka.)

*Waskega.* See Washeka.

**Waskesiu**; creek and lake, tributary to Montreal L., central Sask. (Not Red Deer.)

**Waskik**; lake, southwest of Sipiwesk lake, Manitoba. (Not Waskiktepigo.)

*Waskiktepigo.* See Waskik.

*Waskwatim.* See Wuskwatim.

**Wasp**; lake, Redditt township, Kenora district, Ont.

*Wassienska.* See Washimeska.

**Waswanipi**; H. B. Co. post, lake, also river flowing through Gull and Olga lakes to Mattagami lake, Abitibi territory, Que.

**Watap**; lake, west of Mountain lake, Int. boundary, Thunder Bay district, Ont. (Not Rove.)

**Watch**; island, north of Hill island, St. Lawrence river, Leeds county, Ont.

*Watcheeshoo.* See Watshishu.

**Watchi**; lake, northeast of Reader lake, Manitoba. (Not Mountain.)

**Waterfall**; valley, at the head of Yoho river, Rocky Mts., Kootenay district, B.C.

**Waterfowl**; lakes, on Mistaya river, Rocky mountains, Alberta.

**Waterhen**; lake and river, between Manitoba and Winnipegosis lakes, Manitoba.

**Waterton**; lake and river, southern Alta. (Not Chief Mt. lake nor Kootenai river.)

*Watsheeshoo.* See Watshishu.

**Watshishu**; river, Saguenay county, Que. (Not Watcheeshoo nor Watsheeshoo.)

**Watson**; island, between S. end of Kaien I. and mainland, Coast district, B.C.

**Watson**; railway station, ridge, river and valley, north of Bennett lake. Yukon.

**Watt**; railway station, Charlotte county, N.B. (Not Watt Junction.)

*Watt Junction.* See Watt.

**Waugh**; creek, tributary to Goldstream river, Vancouver island, B.C.

**Waughs**; river, Colchester county, N.S. (Not Wough's.)

*Wauguash.* See Kaniapiskau.

**Waugush**; lake, Spragge township, Algoma district, Ont. (Not Waagoosh.)

*Wave.* See Wavy.

**Wavy**; lake, north of Battle river, Alberta. (Not Wave.)

**Wawagosik**; lake, west of Harricanaw river, Abitibi territory, Que. (Not Wawagosic nor Wawagosie.)

**Waweig**; lake, northwest of Wabinosh lake, Thunder Bay district, Ont.

**Wawiag**; river, Rainy River and Thunder Bay districts, Ont. (Not Kawawiagamak.)

**Wawong**; lake, near Windigokan L., E. of L. Nipigon, Thunder Bay district, Ont.

**Way**; point S.W. of Potter point, Ameliasburg Tp., Prince Edw. Co., Ont. (Not Salt.)

**Wayagamak**; lake, Champlain county, Que. (Not Wayagamack.)

*W. D. Smith's.* See Henry.

**Weaver**; creek, tributary to Moyie river, Kootenay district, B.C.

**Wedding**; river, tributary to Bell river, Abitibi territory, Que.

**Wedge**; island, east of Dokis island, entrance of Key harbour, Georgian bay, Parry Sound district, Ont.

**Wedge**; point, Ladysmith harbour, east coast of Vancouver island, B.C.

**Wedgeport**; village, Yarmouth county, N.S. (Not Tusket Wedge.)

**Wedgwood**; mount, northeast of mount Assiniboine, Rocky mountains, Kootenay district, B.C.

**Wedlock**; island, Admiralty group, St. Lawrence river, Leeds county, Ont.

**Weed**; hills, southeastern Saskatchewan.

*Weenisk.* See Winisk.

**Weese**; creek, Brighton township, Northumberland county, Ont. (Not Weese's.)

**Weggs**; cape, south shore of Hudson strait, New Quebec.

**Weibikwei**; lake, at head of Winisk river, Patricia district, Ont. (Not Pepisquew nor Winisk.)

*Weir.* See Footprint.

*Weir.* See Hennigar.

**Weiscieno**; lake, near Manitou lake, Kenora district, Ont.

**Wekusko**; lake, Grass river, east of Reed lake, Man. (Not Herb nor Sweet Herb.)

*Welchpool.* See Welshpool.

**Welcome**; lake, Lawrence township, Haliburton county, Ont.

**Welland**; river, Welland county, Ont. (Not Chippewa.)

**Wellandport**; hamlet, Lincoln county, Ont. (Not Welland Port.)

**Weller**; bay, near west end of bay of Quinte, Prince Edward Co., Ont. (Not Weller's.)

**Wellesley**; lake, west of White river, Yukon.

**Wellington**; bay and village, Prince Edward county, Ont. (Not Big Sandy bay.)

**Wells**; shoal, southeast of Lyal reef, Bruce county, Ont.

**Welsh**; bank, north of Scott point, Bruce county, Ont.

**Welshpool**; village, on Friar bay, Campobello island, Charlotte county, N.B. (Not Campo Bello, Welchpool nor Welsh-Pool.)

**Wemistagosew**; river, upper waters of Waswanipi river, Abitibi territory, Que.

**Wemps**; bay, in west end of Amherst island, Lennox county, Ont. (Not O'Drain's.)

**Wenasaga**; river, flowing into lac Seul, Patricia district, Ont.

*Wendigokan.* See Windigokan.

**Wenkchemna**; peaks, in the Bow range of the Rockies, Alta. and Kootenay district. B.C. (Not Desolation range nor "The Stragglers.")

*Wepiskow.* See Burntwood.

**Wesketahin**; village, near the mouth of Unahini river, Yukon.

**Weslemkoon**; lake, Addington county, Ont.

**West**; bay, the western extremity of lake Evans, Abitibi territory, Que.

**West**; channel, one of the outlets of lake Winnipeg, Man. (Not West river.)

**West**; river, Bonaventure county, Que. (Not West Port Daniel river.)

**West**; river, Pictou county, N.S. (Not West river of Pictou.)

**West**; river, tributary to Fraser river, above Quesnel, Cariboo district, B.C.

*West.* See Owen.

*West.* See Torres.

**West Arrowwood**; creek, tributary to Bow river, Alberta. (Not West Arrow-wood.)

*West Belanger.* See Bélanger.

**Westboro**; village, Carleton county, Ont. (Not Westborough.)

**Westbourne**; bay, north shore of Hudson strait, N.W.T.

**Westbourne**; post settlement, on Whitemud river, south of L. Manitoba, Man.

*West Branch of Don.* See Don.

*West Branch of Gold.* See Palmer.

*West Branch of Sangan.* See Skonum.

*West Branch of Tobique.* See Sisson.

*West Dog Head.* See Whiteway.

**West Duck**; reef, northwest of Western Duck island, Manitoulin district, Ont.

**Western**; river, emptying into Coronation gulf, N.W.T. (Not Back's Western.)

**Western Duck**; island, of the Duck group, Manitoulin district, Ont.

**Westfall**; river, tributary to Duncan river, Kootenay district, B.C. (Not West Fork of Duncan river.)

*West Flamboro.* See Flamboro West.

*West Flamborough.* See Flamboro West.

*West Fork of Bull.* See Galbraith.

*West Fork of Duncan.* See Westfall.

*West Fork of Kettle.* See Westkettle.

*West Fox.* See Fox.

**Westholme**; post settlement, south of Chemainus river, Vancouver island, B.C.

**Westkettle**; river, tributary to Kettle river, Similkameen district, B.C. (Not West Fork of Kettle river.)

*West McGillivray.* See McGillivray.

*West Niskitogisew.* See Kiskitto.

*West Passage.* See Barrington Passage.

*West Port Daniel.* See West.

*West river of Pictou.* See West.

*West Road.* See Blackwater.

**West Sister**; shoal, S. of Yeo I., entrance to Georgian bay, Manitoulin district, Ont.

*West Winisk.* See Asheweig.

**Wetetnagami**; lake, and river tributary to Opawika river, Abitibi territory and Pontiac county, Que.

**Wettigo**; lake, south of Nemiskau lake, Mistassini territory, Que.

**Weymontachi**; Indian village, at the mouth of Manuan river, upper St. Maurice river, Champlain county, Que. (Not Weymontachingue.)

**Whale**; river, emptying into Ungava bay, New Quebec.

**Whaleback**; mountain, at the headwaters of Yoho river, Rocky mountains, Kootenay district, B.C. (Not Whalesback.)

**Whaler**; bay, Active pass, strait of Georgia, New Westminster district, B.C.

**Wharton**; harbour, north shore of Hudson strait, N.W.T.

**Whatshan**; lakes and river, west of Lower Arrow lake, Kootenay district, B.C.

**Wheaton**; mount, in the "big bend" of Wheaton river, southern Yukon.

**Wheaton**; river, emptying into the west side of Bennett lake, Yukon.

**Wheaton Vault**; brook, flowing into Minas channel, Kings county, N.S.

**Wheeler**; creek, tributary to Michel creek, Kootenay district, B.C.

**Wheeler**; mount, Purity range, Selkirk mountains, Kootenay district, B.C.

**Wheeler**; reef, southwest of Kitchener island, Manitoulin district, Ont.

**Whetstone**; lake, Lake township, Hastings county, Ont.

**Whiffen**; spit, Sooke inlet, Vancouver island, B.C.

**Whipple**; mount, east of the elbow of Stikine river, Cassiar district, B.C.

**Whipsaw**; creek, flowing northeasterly into Similkameen river, Yale district, B.C.

**Whirlpool**; river, flowing from Athabaska pass northerly into Athabaska river, Alta.

*Whirlpool.* See Sunwapta.

**White**; cliff, northeast of Hungerford point, Manitoulin I., Manitoulin district, Ont.

**White**; mount, north of Atlin lake, Yukon.

**White**; pass, at head of Skagway river, Cassiar district, B.C.

**White**; river, tributary to Kootenay river, below Palliser river, Kootenay district, B.C.

**White**; river, tributary to Yukon river, above Stewart river, Yukon.

**White**; strait, north shore of Hudson strait, N.W.T.

*White.* See Ketch.

**White Bear**; bay, northeast of Markham bay, Hudson strait, N.W.T.

**White Bear**; lake and river, at headwaters of Gatineau river, Champlain county, Que.

**Whitebear**; lake, north of Saskatchewan Landing, southern Sask. (Not White Bear.)

*White Bear.* See Cassels.

**Whitecap**; creek, flowing into the creek connecting Anderson and Seton lakes, Lillooet district, B.C. (Not Portage.)

**Whitecap**; mountain, Lat. 50° 43′, Long. 122° 35′, Lillooet district, B.C.

**Whiteclay**; lake, Ogoki river, east of Whitewater lake, Thunder Bay district, Ont.

**White Douglas**; the southern peak of mount Douglas, Rocky mountains, Alberta.

*Whitefish.* See David.

*Whitefish.* See Garson.

*Whitefish.* See La Sarre.

*Whitefish.* See Meacham.

*Whitefish Spawning.* See Chukuni.

**Whitefox**; river, tributary to Torch river, central Saskatchewan. (Not White Fox.)

*White Goat.* See Cline.

**Whitegoose**; river, tributary to Migiskan river, below Paskagama lake, Pontiac county, Que. (Not White Goose.)

**White Grouse**; creek, east of Whatshan lake, Kootenay district, B.C.

**Whitehorn**; mountain, northwest of mount Robson, Cariboo district, B.C. (Not Turner nor White Horn.)

**Whitehorse**; town and rapid, Lewes river, below Miles cañon, Yukon. (Not White Horse.)

**White Man**; pass, Rocky Mts., Alta. and Kootenay district, B.C. (Not White Man's.)

**Whitemouth**; lake and river, tributary to Winnipeg river, also village, Manitoba. (Not White Mouth.)

**Whitemud**; river, flowing into the southern end of lake Manitoba, Man. (Not White Mud nor White-mud.)

*White Mud.* See Frenchman.

**Whiterock**; hamlet, Kings county, N.S. (Not White Rock Mills.)

*White Rock Mills.* See Whiterock.

**Whites**; hamlet, Kings county, N.S. (Not White's Corner.)

**Whites**; post office, Huntingdon county, Que. (Not White's nor White's Station post office.)

*White's.* See Geikie.

**Whitesand**; lake and river, emptying into northern end of lake Nipigon, Thunder Bay district, Ont.

**Whitesand**; post office and river, southeastern Saskatchewan. (Not White Sand.)

*White's Corner.* See Whites.

**Whiteshell**; lake and river, emptying into Winnipeg river, Manitoba.

**Whiteshore**; lake, east of Tramping lake, Saskatchewan. (Not White Shore.)

*White's Station.* See Whites.

**Whitestone**; lake, north of Cat lake, Patricia district, Ont.

**Whitestone**; river, tributary to Tatshenshini river, southwestern Yukon.

**Whiteswan**; river, emptying into Teslin L., Cassiar district, B.C. (Not White Swan.)

**Whitewater**; lake, southwestern Manitoba.

*Whitewater.* See Taseko.

**Whiteway**; point, at west side of north entrance to the narrows of lake Winnipeg, Man. (Not Dog's Head nor West Dog Head.)

*White Whale.* See Wabamun.

**Whitewood**; lake, Tp. 29, R. 17, W. 2 M., southeastern Saskatchewan.

*Whitewood.* See Basswood.

**Whitford**; lake, Tp. 56, Rs. 15 and 16, W. 4th M., Alberta.

**Whitley**; bay, northwest of Burgoyne bay, Hudson strait, New Quebec.

**Whitney**; lake, Smellie township, Kenora district, Ont.

**Wholdaia**; lake, an expansion of Dubawnt river, N.W.T. (Not Wholdiah.)

**Whymper**; mount, near head of Chemainus river, Vancouver island, B.C.

**Whymper**; mount, northwest of Storm mountain, Rocky mountains, Alberta.

*Whymper.* See Kiwetinok.

**Whyte**; mount, west of lake Louise, Alberta.

**Wiachuan**; river, Richmond gulf, New Quebec. (Not Wiachewan nor Wiachouan.)

**Wicked**; point, Athol township, Prince Edward county, Ont. (Not Salmon.)

**Wickens**; lake, Britton township, Kenora district, Ont.

**Wickham**; post office and railway station, Drummond Co., Que. (Not Wickham West.)

*Wickham West.* See Wickham.

**Wicksteed**; rock S.E. of Dead I., entrance to Key har., Georgian B., Parry S. dist, Ont.

**Wigwam**; river, tributary to Elk river, Kootenay district, B.C.

*Wigwas.* See Eva.

**Wigwasan**; lake, west of Bukemiga lake, Thunder Bay district, Ont.

**Wigwasikak**; lake, northwest of Cat lake, Patricia district, Ont. (Not Birch.)

*Wikwasash.* See Mikwasach.

*Wikwaskapauk.* See Mourier.

**Wilcocks**; lake, Whitchurch township, York Co., Ont. (Not Wilcox nor Willcocks.)

**Wilcox**; lake, English river, Kenora and Patricia districts, Ont.

**Wilcox**; pass and peak, north of Mt. Athabaska, Rocky mountains, Alberta.

**Wild**; bight, west side of Fitzwilliam island, Manitoulin district, Ont.

**Wild Horse**; river, tributary to Kootenay R., Kootenay district, B.C. (Not Skirmish.)

**Wilkie**; mount, southwest of Gerrard, Kootenay district, B.C.

**Wilkinson**; creek, tributary to the Westkettle river, above Carmi, Similkameen district, B.C.

**Willard**; lake, north of Hawk lake, Kenora district, Ont.

*Willcocks.* See Wilcocks.

**Willet**; mount, east of upper portion of Kootenay lake, Kootenay district, B.C.

**William**; head, at north entrance to Pedder bay, Vancouver island, B.C.

**Williams**; bay, south shore of L. Seul, Kenora district, Ont.

*Williams.* See John.

**Williams**; lake, east of Cat lake, Patricia district, Ont.

**Williams**; lake, east of Fraser river, in the southern portion of Cariboo district, B.C.

**William Smith**; cape, northeast shore of Ungava bay, New Quebec.

**Willoughby**; island, northeast of Grenadier island, St. Lawrence river, Leeds Co., Ont.

**Willowbank**; creek and mountain, west of Blueberry river, Rocky mountains, Kootenay district, B.C.

**Willowbunch**; hamlet and lake, southern Saskatchewan. (Not Willow Bunch.)

**Willowgrove**; post office, Haldimand county, Ont. (Not Willow Grove.)

**Wilson**; creek, flowing southerly into Slocan lake, at Rosebery, Kootenay district, B.C.

**Wilson**; hamlet, Grenville county, Ont. (Not Wilson's Bay.)

**Wilson**; hamlet, northwest of Chemainus river, Vancouver island, B.C. (Not Wilson's Crossing.)

**Wilson**; mount, also glacier, north of Mt. Murchison, Rocky mountains, Alberta.

**Wilson**; mount, also lake, Ross river, Yukon.

**Wilson**; river, flowing easterly into Dauphin lake, Manitoba.

*Wilson.* See Kiwetinok.

**Wilson Corners**; hamlet, Wakefield Tp., Ottawa Co., Que. (Not Wilson's Corners.)

*Wilson's Bay.* See Wilson.

*Wilson's Crossing.* See Wilson.

**Wilton**; creek, flowing southwesterly into Hay bay, Addington and Frontenac counties, Ont. (Not Big.)

**Wiltse**; lake, Leeds county, Ont. (Not Wiltz nor Wiltze.)

**Wiltshire**; village, Queens county, P.E.I. (Not New Wiltshire nor North Wiltshire.)

**Wimapedi**; brook, tributary to Burntwood river, Manitoba.

**Winawiash**; lake, southwest of Grand lake Victoria, Timiskaming county, Que.

**Wind**; mountain, west of Kananaskis river, Rocky Mts. park, Alta. (Not Windy.)

**Windermere**; lake and town, at headwaters of Columbia river, Kootenay district, B.C. (Not Lower Columbia lake.)

**Windigo**; bay and islands, north shore of lake Nipigon, Thunder Bay district, Ont.

**Windigo**; lake and river, tributary to Severn river, Patricia district, Ont.

**Windigokan**; lake, E. of L. Nipigon, Thunder Bay district, Ont. (Not Wendigokan.)

**Windy**; arm, Tagish lake, Yukon.

**Windy**; lake, southwest of Oxford lake, Manitoba.

**Winefred**; lake and river, tributary to Christina river, eastern Alberta.

**Winging**; point, east headland of Fourchu bay, opposite Guyon island, Cape Breton county, N.S. (Not Wining nor Winning.)

*Wining.* See Winging.

**Winisk**; lake and river, Patricia district, Ont. (Not Wai-nusk nor Weenisk.)

**Winiskisis**; river, tributary to upper Winisk river, Patricia district, Ont.

**Winnange**; lake, north of Dryberry lake, Kenora district, Ont. (Not Vulture.)

*Winning.* See Winging.

**Winnipegosis**; a large lake in Manitoba. (Not Winnipegoos nor Winnipegoosis.)

**Winonitikameg**; lake, northwest of Attawapiskat lake, Patricia district, Ont.

**Wintawanan**; lake, southwest of Attawapiskat lake, Patricia district, Ont.

**Wintego**; lake, an expansion of Churchill river, below Reindeer river, Sask.

**Wintering**; lake, west of Landing lake, Manitoba.

**Witchai**; lake, on lower Grass river, Manitoba.

**Witchekan**; lake, in the Thickwood hills, central Saskatchewan.

**Wiwa**; creek, flowing easterly into Wood river, southern Saskatchewan.

**Wiwaxy**; peaks, southwest of mount Victoria, Rocky mountains, Kootenay, B.C.

*Wi-yat.* See Waiatt.

**Wizida**; lake, at headwaters of Attawapiskat river, Patricia district, Ont.

**Wizidans**; lake, at headwaters of Attawapiskat river, Patricia district, Ont.

**Woden**; peak, Valhalla mountains, Kootenay district, B.C.

**Wolf**; cañon, Pelly river, above Woodside river, Yukon.

**Wolf**; creek, tributary to Klondike river, Yukon.

*Wolf.* See Grimsthorpe.

*Wolf.* See Muhigan.

**Wolfe**; island, St. Lawrence river, Frontenac county, Ont. (Not Long.)

**Wolfe**; island, south of DeStein point, Prince Rupert harbour, Coast district, B.C.

**Wolfe Island**; township and village, Wolfe island, Frontenac county, Ont. (Not Marysville village.)

**Wolfestown**; township and village, Wolfe county, Que. (Not Wolfstown.)

*Wolf Rand.* See Muhigan.

*Wollaston land.* See Wollaston peninsula.

**Wollaston**; peninsula, S.W. portion of Victoria I., N.W.T. (Not Wollaston land.)

**Woman**; lake and river, south of Shabumeni lake, Patricia district, Ont. (Not Woman Lake river.)

**Wonder**; pass and peak, south of Mt. Assiniboine, Rocky mountains, Alberta, and Kootenay district, B.C.

**Wood**; brook, tributary to Grass river, Manitoba.

**Wood**; mount, west of Saanich inlet, Vancouver island, B.C.

**Wood**; mountain and river, also Wood Mountain post office and R.N.W.M. Police station, southern Saskatchewan. (Not Wood Mountain river.)

*Wood.* See Jacob.

**Woodbury**; creek and point, west side of Kootenay lake, north of Ainsworth, Kootenay district, B.C. (Not Woodberry.)

**Woodley**; range of mountains, west of Kulleet bay, Vancouver island, B.C.

*Wood Mountain.* See Wood.

**Woodroffe**; village, Carleton county, Ont. (Not Woodroofe nor Woodruff.)

**Woods**; island, Ladysmith harbour, Vancouver island, B.C. (Not Long.)

**Woods**; lake of the, on international boundary, Kenora and Rainy River districts, Ont.

*Woods.* See Carroll Wood.

**Woodside**; river, tributary to upper Pelly river, Yukon.

**Woodtick**; island, St. Clair river, Lambton county, Ont. (Not Fawn.)

**Woody**; river, flowing northeasterly into Swan lake, Manitoba and Saskatchewan.

*Work.* See Wark.

**Worthington**; creek, west of Lower Arrow lake, Kootenay district, B.C.

**Wotan**; mount, Adamant range, Selkirk mountains, Kootenay district, B.C.

**Wotinimata**; lake, east of Shabogamo lake, Pontiac county, Que.

**Wreck**; point, southwest of Tobermory harbour, Bruce county, Ont.

**Wrench**; lake, northeast of Carlton, central Saskatchewan.

**Wright**; bay, north shore of Amherst island, Lennox county, Ont (Not Scott nor Wrights.)

**Wright**; creek, west end of Surprise lake, Cassiar district, B.C.

**Wright**; creek, tributary to Blanche river, Timiskaming district, Ont.

**Wright**; point, north of Goderich, Huron county, Ont.

**Wright**; sound, between Gil and Gribbell islands, Coast district, B.C.

**Wrigley**; settlement and H. B. Co. post, on the east side of Mackenzie river, N.W.T. (Not Fort Wrigley.)

**Wunnummin**; lake, upper waters of Winisk river, Patricia district, Ont.

**Wuskatasko**; brook, tributary to Grass river, Manitoba.

**Wuskwatim**; brook, and lake on Burntwood river, Manitoba. (Not Beaver-dam, Ooskootim nor Waswatim.)

*Wyatt.* See Waiatt.

**Wynott**; point, N.E. of Head harb., St. Margaret bay, Halifax Co., N.S. (Not Smith.)

## X

*Xschwan.* See Granby.

## Y

**Yahk**; mountain, river and railway station, in S.W. portion of Kootenay district, B.C.

**Yalakom**; game reserve, between Yalakom and Fraser rivers, Lillooet district, B.C.

**Yalakom**; river, flowing southeasterly into Bridge river, Lillooet district, B.C. (Not North fork of Bridge river.)

**Yarrell**; mount, in southeastern portion of Kootenay district, B.C.

**Yawningstone**; lake, north of Cormorant lake, Manitoba.

**Yellow**; point, northeast of Kulleet bay, Vancouver island, B.C.

*Yellow Knife.* See Taltson.

**Yeo**; channel, island and spit, at entrance to Georgian bay, Manitoulin district, Ont.

**Yeo**; island, southwest of Grenadier island, St. Lawrence river, Leeds county, Ont. (Not Bluff nor Old Bluff.)

**Yeth**; creek, tributary to Inklin river, Cassiar district, B.C.

**Yoho**; glacier, lake, park, pass, peak and river, Rocky mountains, Kootenay district, B.C. (Not Collie glacier, Glacier creek, North Fork river, Upper Emerald lake nor Wapta lake and pass.)

**York**; river, trib. to Madawaska river, Hastings and Renfrew counties, Ont. (Not York branch.)

**York**; sound, in southwest portion of Frobisher bay, N.W.T.

**Yorke**; island, Admiralty group, St. Lawrence river, Leeds Co., Ont. (Not Boss Dick.)

**Youell**; island, east of Hopkins point, Bruce county, Ont.

**Young**; lake, Dalton township, Victoria county, Ont. (Not Montgomery.)

**Youngs**; point, Weller bay, Ameliasburg township, Prince Edward county, Ont.

*Young's.* See Limestone.

**Yukness**; mount, southwest of mount Lefroy, Kootenay district, B.C.

**Yukon**; river and territory, N.W. Canada. (Not Youcon, Youkon, Kwichpak.)

## Z

**Zachariah**; point, near Dodd narrows, east coast of Vancouver island, B.C.

**Zanardi**; rapids, at S.W. end of Wainwright basin and S. of Kaien I., Coast dist. B.C.

**Zemawdza**; Indian village, Kitimat arm, Coast district, B.C. (Not Ze-mawd-za.)
**Zenazie**; creek, south of Gladys lake, Cassiar district, B.C.
**Zero**; rock, Haro strait, N.E. of Gordon head, S.E. coast of Vancouver I., B.C.
**Zinc**; mountain and valley, east of Ice river, Rocky mountains, Kootenay district, B.C.
**Zinkan**; island, Pine Tree harbour, Bruce county, Ont.
**Zwick**; island, bay of Quinte, Hastings county, Ontario. (Not Zwick's.)
**Zymoetz**; river, tributary to Skeena river, Coast district, B.C. (Not Copper.)

# INDEX

## NAMES ARRANGED FOR PROVINCES, COUNTIES, ETC.

### ALBERTA.

## ALBERTA—*Continued.*

*Grave*
*Green*
Gregg
*Grizzly Bear*
Grotto
Haddo
Hamilton
Hanalta
Hand
Hardisty
Harrison
Hastings
Haven
*Hazel*
Head
Heart
Hector
Helen
*High*
Highwood
Hoffman
Horse
Horseshoe
House
*House*
Howse
Hungabee
Inglismaldie
Inverness
Iosegun
Iron
Isabella
*Island*
Isle
Jacob
James
Jarvis
Jonas
Jumpingpound
Junction
*Ka-koot*
Kakut
Kananaskis
Katherine
*Kcheewin*
Kehiwin
Kenilworth
Kerkeslin
Kipp
Kirkpatrick
Knee
Kneehill
Kneehills
*Kootanie*
*Kootenai*
LaBiche
Lacroix
Laggan
Landels
La Nonne
Leah
Lee
Lefroy
Lesser Slave
Lineham
Little
Little Bow
*Little Brazeau*
*Little Fork of Sask.*
Little Smoky
*Little Vermilion*
Livingstone
Lobstick
Lodge
*Lonely Valley*
*Long*
Louis
Louise
*Lower Bow*
*Lower Whitefish*
Lusk
Lychnis
Lyell
Macabee
McDougall
McKay
McLeod
Macleod
McMurray
*Mahmee*
Maligne
Mami
Margaret
Marmot
Martin
Martineau
Mary Vaux
Medicine
Medicine Lodge
*Medicine Lodge*
Merlin
*Middle Branch* (Highwood R.)
Mikkwa
Milk
Ministik
Minnewanka
Miquelon
*Mire*
Mirror
Missawawi
Mist
Mistaya
Misty
Moberly
Mokowan
Molar
*Moose*
Moraine
Murchison
Muriel
Murray
Namaka
Neutral
Newman
Niblock
Nikanassin
*Noores*
Nordegg
Norquay
North Fork
North Heart
North Kootenay
North Vermilion
*Nose*
Noyes
Observation
Okotoks
Old Fort
Oldman
Olive
Opabin
Opal
Otauwau
*O-Tow-Wow*
Owl
Oyster
Paddle
*Paddle*
*Pak-oghke*
Pakowki
Panther
Paradise
*Pass*
Paul
Peace
Peechee
*Peekopee*
Peerless
Pekisko
Pembina
*Pembina*
Peyto
Piegan
Pigeon
Pika
Pinnacle
*Pipe*
Pipestone
*Pt. Brulé*
Poboktan
Popes
Porcupine
Portal
Pothole
Pouce Coupé
Primrose
Protection
Ptarmigan
Pulpit
Pulsatilla
Rae
Rainy
Ram
Raven
*Red*
Red Deer
*Red Deer*
Redoubt
Redwater
Ribstone
Richardson
Roche de Smet
*Roche Suett*
*Rocky*
Rolph
Rosebud
Ross
Rundle
Saddle
St. Ann
St. Mary
St. Nicholas
St. Piran
Sakwatamau
Samson
Sarcee
Saskatchewan
Saulteux
*Sauteur*
*Sauteux*
*Savasse Berry*
Sawback
Sentinel
Serviceberry
Sevenpersons
Shanks
Shaver
Sheep
Sheol
Shunda
Sibbald
Siffleur

## ALBERTA—*Concluded.*

Silverhorn
Simonette
Simpson
Sinking
Skoki
*Slave*
*Small*
Smith
Smoky
*Snake*
Sounding
*S. Brch.* (Highwood R.)
Southesk
*Southfork*
South Heart
Spencer
Spirit
Spray
Sprucegrove
Square
Steepbank
*Sterling*
Stewart
Stimson
Stirling
Stonyplain
Storm
Stutfield
Sullivan
Sulphur
Sunwapta
Sutherland
Swan
*Swan*
Sweathouse
Sylvan
Table
Tekarra
Temple
Ten Peaks
Tent
The Beehive
*The Goat's Looking Glass*
The Mitre
Thérien
*The Saddle*
*The Stragglers*
*The Twins*
Thompson
Threehills
Threepoint
Three Sisters
Tilted
Tombstone
Tongue
*Tongue-flag*
Tower of Babel
*Trail*
*Trout*
Turquoise
Turret
Turtle
Tuzo
Twin
Tyrrell
Unwin
*Upper Bow*
*Upper Whitefish*
Verdigris
Vermilion
Victoria
Volcano
Vulture
Wabamun
*Wabasca*
Wabiskaw
Wallace
Wapiabi
Wapiti
Ware
Warren
Waskahigan
Waterfowl
Waterton
*Wave*
Wavy
Wenkchemna
W. Arrowwood
Whirlpool
*Whirlpool*
White Douglas
*Whitefish*
*White Goat*
White Man
*White Whale*
Whitford
Whymper
Whyte
Wilcox
Wilson
Wind
Winefred
Wonder

## BRITISH COLUMBIA.

*(Names arranged for Land Districts.)*

### Cariboo.

Alexis
*Anaham*
Anahim
Athabaska
Battle
*Bear*
*Black*
Blackwater
*Bobtail*
Bowron
Cariboo
*Caribou*
Chetang
Chilako
*Chilanco*
Chilanko
*Chilco*
*Chilcote*
Chilcotin
Chilko
Chimney
Chown
Eulatazella
Gelkie
Giscome
*Great Bear*
*Helena*
Kluney
Moberly
Mowat
*Mud*
Mumm
Naltesby
Nechako
Pantage
*Pelican*
*Ptarmigan*
Purden
Quesnel
Riske
Robson
Sinkut
*Stewart*
Stuart
Tatel
Titkana
*Tsinkut*
*Turner*
West
*West Road* (river)
Whitehorn
Williams

### Cassiar

*Ahwillgate*
Alskew
Alsek
Anuk
Anvil
*Arkell*
Arthur Seat
Atlin
Awillgate
Babine
Barham
Bastion
Beady
Bear
*Bear*
Beaton
Beaver
Bee
Bennett
Bernard
Black
Blanchard
Blue
Boofus
*Boulder*
*Brown Dome*
Buck
*Buckley*
Bulkley
Cameron
Canyon
Carter
Cassiar
Chehalis
Chikolda
Chismaina

## BRITISH COLUMBIA—*Continued.*

**Cassiar**—*Con.*

Choquette
Clearwater
Cone
Consolation
Copper
Cottonwood
Crater
Davenport
Dease
*Deep*
Defot
Disella
Distingué
Dixie
Dokdaon
Duckie
Dudidontu
Eagle
Eagle Crag
Ealue
Edgar
Edmund
Egnell
*Eightmile*
Elbow
Ewing
Fantail
Farnsworth
*Fifteen-mile*
Finlay
Gladys
Glave
Glenora
*Goat*
Goodwin
*Goose*
Gordon
Graham
Granby
Gun
Hackett
Halcro
Hale
Hall
Harold
Hartz
Hatchau
Hatin
Hayes
Hazelton
Heart
Hendon
Hitchcock
Homan
Hotailuh
Hurricane
Hutsigola
Hyland
Ice-cap
Inklin
*Iskut*
Jennings
Johnson
Kaha
Kahtate
Kaketsa
Kakuchuya
Kates Needle
Katina
Kennicott
Kelsall
Ketchum
Kinaskan
Kispiox
Kitgargas
Kitwanga
Klootchman
Kluatantan
*Knob*
*Kluchman*
*Koketsa*
Koshin
Kuldo
Kusawa
Kuthai
Kwadacha
Lacroix
Laketon
Laura
Laurie
*Lecroix*
Leonard
Liard
Lina
Lindeman
*Lyndeman*
Little Tahltan
Llewellyn
*Long*
McCallum
McDame
McDonald
McGrath
*Macha*
McIntosh
McKee
McLay
McLeod
McMaster
Mansfield
Marble Dome
Maria
Matsatu
Mesilinka
Middle
Minto
Mountain
Muchuya
Munro
Mussen
*Naas*
Nadahini
Nahlin
Nakina
Nakonake
Nass
*Nasse*
Nelson
Nevin
*North*
*North Tacla*
Observation
O'Donnel
O'Keefe
*Omenica*
Omineca
*Oosilinka*
Osilinka
Ospika
*Otter*
*Ozalinca*
Paradise
Parton
Pereleshin
Peveril
Pike
Plateau
Porcupine
Porphyry
Porter
*Porter's Landing*
Quadacha
Quartz
Robertson
Rocher Déboulé
*Round*
Ruby
Ruth
Saddle
Sanford
Sawback
Scud
Shakes
Shallow
Sharpe
Shegunia
Sheslay
Silver Salmon
Skeena
*Skena*
*Slocoh*
Sloko
Snowcap
Snowdon
Snowy
*Spica*
Stanley
*Stick-ah-din*
Stikyadin
Stikine
Stovel
*Stranger*
*Sucker*
Sugarloaf
Sullivan
Summit
Sunday
Surprise
Suskwa
Table
*Table*
*Tacho*
*Tacla*
Tagish
Tahltan
Takla
Taku
*Taku*
Talaha
Tanzilla
*Tatiki*
Tatshenshini
Tatsho
Tattiki
Tawina
Taysen
*Tchutetzeca*
Telegraph
Telkwa
Teresa
Terrahina
Teslin
The Knob
Thibert
*Thustetzeca*
Thutade
*Toochi*

## BRITISH COLUMBIA—*Continued.*

### Cassiar—*Con.*

*Tootizeca*
*Tooya*
Torres
*Tory*
Trout
Tsetelui
Turner
*Tutchi*
Tutesheta
Tutizika
Tutizzi
Tutshi
Tuya
Tyee
Vadso
Vents
*West*
Whipple
White
Whiteswan
*Xschwan*
Yeth
Zenazie

### Coast.

Amy
Antonio
Arm
Ashton
Babine
Bacon
*Bacon*
Barnes
Barrett
Beatty
Bellabella
Bellakula
Birkby
Bishop
Bjerre
*Blackney*
*Black*
Blackwater
Blakeney
Bodega
Boundary
Boxer
Bramham
*Branham*
*Buckley*
Bulkley
Burns
Burroughs
Butze
*Cahnish*
*Caleta*
*Canyon*
*Cardero*
*Cascade*
Casey
Charles
Chassepot
Cheslatta
*Chickens*
*Chilanco*
Chilanko
*Chilco*
*Chilcote*
Chilko
*China Hat*
Choelquolt
Chonat
Clio
*Cloyah*
Coast
Comblain
Connolly
Cooper
*Copper*
Cordero
Coste
Crease
Cumming
Cundale
David
*Dawkins*
Dean
Decker
Delusion
Denise
De Stein
Dodge
Dorothy
Douglas
Driftwood
Dryad
Dundas
Du Vernet
Eagle
Ecstall
*Ecstew*
Eddy
Edgell
Eliot
Elizabeth
Ellinor
*Elliot*
Emilia
Emmerson
Endako
Essington
Etta
Eva
Exstew
Fairview
Falcon
Farewell
Fern
Fisherman
*Flat*
*Fort Fraser*
*Fort James*
Fort St. James
*Français*
Francisco
François
Fraser
Frederick
Galloway
Garden
Gardner
Gaudin
Georgia
Gertrude
Ghost
Gil
Gobell
*Graeme*
Gramophone
Granite
Grant
Gribbell
Grindstone
Guard
*Guard*
Gurd
Hall
Hallett
Halsey
Hawkesbury
Hays
*Hays*
Hecate
*Hecate*
Helen
Hibben
Hill
Hippa
*Hockstall*
*Holmes*
*Homalko*
Homathko
Home
Hopkins
Horsfall
Hubert
*Huckstall*
Hudson Bay
*Huxstall*
Ikeda
*Ingraham*
Inverness
Islet
Joassa
Jorkins
Kaien
Kaiete
*Ka-its-siks*
Kanish
Kasiks
Kathlyn
Kerr
Kersey
Kestrel
*Ki-ette*
Kildala
Kinahan
Kingcome
Kitimat
Kitkiata
Kitsalas
*Kitselas*
Kitsumgallum
Klemtu
Kloiya
Knapp
Koya
Kunghit
*Kuper*
Kwinitsa
*Kyeet*
*Lake*
Lakelse
Langara
Laurier
Lelu
Lewis
*Lewis*
Lima
*Long*
Loretta
Louis
*Louis*
McKay
*McLaughlin*
McLoughlin
Maitland
Maple
Marina

## BRITISH COLUMBIA—*Continued.*

### Coast--*Con.*

Martini
Mary
*Mary*
Maurelle
Mayes
*Mayor*
Melville
Metford
Metlakatla
Miller
Minette
Miskatla
Mission
Money
Moody
Moore
Morice
Moricetown
*Morrice*
*Morricetown*
Morse
Mouat
*Na-a-ma*
Nadina
*Nadinaka*
*Nalta*
Nankivell
Nasoga
Nechako
Nelly
Nemaia
*Nesto*
Nicholas
*Nicolas*
Niut
*Noel*
*Noolki*
*North*
*North Porpoise*
*North Skeena*
Nowell
Nubble
Nulki
Octopus
Okisollo
*Oldfield*
Ootsa
Ormonde
Osborn
Owen
*Oxstall*
Paisley
Parizeau
Pender
Pepin
Pethick
Phelan
Philips
Photograph
Pillsbury
Pilot
Porpoise
*Port Essington*
*Prevost*
Prince Rupert
Promise
Pulteney
Pulton
Quadra
*Quaneca*
*Quinitsa*
Raley
Raymond
Ridley
Riordon
Ritchie
Roberson
*Round*
Russell
Salvus
Schreiber
Scott
Seal
Shames
Sharbau
Shawatlan
*Shoo-wah-tlans*
Simpson
Siwiti
*Skaloo*
Skeena
Skelu
*Skena*
Skidegate
Skonun
Snider
Sockeye
Sonora
Southgate
*South Porpoise*
Spire
Springer
*Square*
Squire
*Stainforth*
Staniforth
Stapledon
*Stelako*
Stella
Stellako
Stevens
*Stewart*
*Stickelahn*
Stikelan
Stuart
Surge
Tachick
Tarte
Tatla
*Tatlahco*
Tatlayako
*Tatlayoco*
Tatlayoko
*Tatlayoo*
*Tchow-un*
Telkwa
*Tiahn*
Tian
Tide
Tobey
Tomkinson
Tomlinson
Tremayne
Trivet
Tuck
Tullin
*Turn*
Turtle
Tyee
Ursula
*Valdes*
Venn
Verney
Vigilant
Waiatt
Wainwright
Walbran
Walkem
*Walkem*
Walters
Wark
Watson
Wedge
*West Br. Sangan R.*
*Wi-yat*
Wolfe
*Work*
Wright
*Wyatt*
Zanardi
Zemawdza
Zymoetz

### Kamloops.

Adams
*Anesty*
Angle
Anstey
Bastion
*Chipooin*
Chipuin
Connaught
Coutlee
Fraser
*George*
Gold
Gorge
Griffin
Hunters
Ida
Joss
Little Shuswap
Mabel
Mara
Monte
Murtle
*Myrtle*
Nicoamen
Nicola
*Nisconlith*
*Niskainlith*
Niskonlith
Nohomin
Paul
*Reservation*
Roches
Salmon
Salmon Arm
Seymour
*Shoushwap*
Shuswap
S. Thompson
*Spallumcheen*
*Toonkwa*
Tunkwa
*Upper Nicola*

### Kootenay.

Abbot
Abbott
Adamant
Afton
Ainsworth
Airy
Akamina
*Akamina*
*Akimina*
Akolkolex

## BRITISH COLUMBIA—*Continued.*

**Kootenay**—*Con.*

*Akotkolex*
Albert
Aldridge
Alexander
Alexandra
Amiskwi
*Angle Peak*
Ann
Anstey
Argentine
Argonaut
Argyle
Arrowpark
Assiniboine
Asulkan
Athalmer
Augustine
Austerity
Avalanche
Aye
Ayesha
Azimuth
*Bad*
Badshot
Bagheera
Bain
Baker
Bald
Baldur
Balfour
Bannock
Battle
*Bear*
Beatrice
Beaver
Beaverfoot
*Beavertail*
Bedlington
Begble
Behrman
Biddle
Bingay
Blackfriars
Blackwater
Blaeberry
Blue
*Blueberry*
Blue Grouse
Bobble Burns
Bonanza
Bonney
Booth
Bor
Bosworth
Boulder
*Boulder*
Boundary
Bow
Bowman
Brenner
Brewery
Brisco
Broadwood
Bruins
Bryce
Bugaboo
Bull
Burgess
Burton
Bush
Butwell
Cabin
Cahill
*Calder*
Campbell
Canterbury
*Canyon*
*Cape Horn*
Caribou
*Caribou*
Carney
Carpenter
*Carroll*
Cartier
Carnarvon
*Cascade*
Castor and Pollux
Catamount
Cataract
Cathedral
Caven
*Cedar*
Centurion
Chancellor
Chaperon
Cheops
Cherub
Christy
Cinnamon
Citadel
Clachnacudainn
Clarke
*Clear*
Coal
Cockle
Cogle
Collie
*Collie*
Columbia
Comb
Cony
Cooper
Copeland
Coral
Corbin
Cornice
Corsair
Cougar
Couldrey
Cranberry
Cranbrook
Creston
Cross
Crowsnest
Cupola
Curtis
Cyprian
Dago
Dainard
Daly
Davis
Dawson
Deer Park
Deltaform
Demers
Dennis
Dent
Denver
*Despatch*
*Desolation*
Deville
Dibble
Dispatch
Doctor
Dogtooth
Dolly Varden
Donkin
Duchesnay
Dunbar
Duncan
Dutch
Eagle
Earl Grey
*E. F. Wilson*
Elk
Emerald
*Emerald*
Ennis
Erickson
Esplanade
Evans
Falls
Farnham
Felucca
Ferro
Ferguson
Fernie
Feuz
Field
Fife
Findlay
Fire
*First N. Fk.* (Fitzstubbs Cr.)
*First W. Fk.* (Wilson Cr.)
*Fish*
Fisher
Fitzstubbs
Flat
Flathead
Fleming
Float
Fording
Forster
*Fort Steele*
Fosthall
*Four-mile*
Fox
Frances
*Freda*
Freshfield
Freya
Frigate
Fritz
Fry
Gainer
Galbraith
Galena
Galton
Garnet
Gateway
Gelkie
Gibraltar
Giegerich
Gillis
Gimli
*Glacier*
Glacier Crest
Gladsheim
Gladstone
Glenogle
Gnat
Goatfell
Gold
Goldstream
Goodsir
Gordon
Gothics
Grace
Graham

## BRITISH COLUMBIA—*Continued.*

**Kootenay**—*Con.*

Grand
Granite
Grant
Grave
Grays
Gray Wolf
Green
*Green*
Greens
*Green's*
*Greys*
Grizzly
Grundy
Guardsman
Habel
Hadow
Halcyon
Hall
*Haly*
Hamill
*Hammond*
Hanbury
Hansen
Harmer
Harvey
Haskins
Häsler
Hawkins
Haygarth
Healy
Heart
Hector
Heimdal
Hela
Helmet
Henretta
Hermit
*Hidden*
Hilda
Hobson
Hoder
Hogg
Holway
Hoodoo
Hooker
Horn
*Horn*
Horsethief
Hosmer
Hospital
*House*
Howell
Howse
Howser
*Howser*
Huber
Hughes
Hungabee
Hungry
Hunter
Hurd
Hutchison
Ice
Iconoclast
Illecillewaet
Incomappleux
Indian
Ingersoll
Inonoaklin
Invermere
*Insulated*
Irishman
Iron
Isolated
John
Johnson
Johnston
Jordan
Joseph
Jumbo
Kananaskis
Kaslo
Kate
*Kauffman*
Keen
Kerr
Kicking Horse
Kid
Kikomun
Killarney
Kilpatrick
Kinbasket
King
Kingsgate
Kishinena
*Kitamin*
Kitchener
Kiwetinok
*Kokamun*
*Koos-ka-nax*
Kootenay
Kuskanax
Kuskonook
Ladybird
LaFrance
Lake
Lakit
Lamb
Lardeau
*Lardo*
Laussedat
Lavina
Lavington
Lazy
Leach
Leanchoil
Leda
Lefroy
Leon
*Leon Hot Springs*
Lewis
Lily
Linda
Line
Linklater
*Linkwater*
Little
Little Slocan
Lizard
Lladnor
Lodgepole
*Lonely*
*Lone Tree*
Lookout
Loop
Lower Arrow
Luke
Lussier
Lyell
McArthur
McBean
McCormick
McDonald
Macdonald
McDougal
McEvoy
McGregor
Mackenzie
McKian
*McMullen*
McNicoll
Macoun
Macpherson
Manganese
Marion
Mark
Marpole
Marten
Martins
Matthew
Maus
Meacham
Meadow
*Meadow*
*Mescoh*
Michael
Michaud
Michel
*Mid. Fork* (Findlay Cr.)
*Mid. Fork* (Gold Cr.)
*Mid. Fork* (Spillimacheen R.)
Minaret
Mineral
Misko
Mista
Mitchell
Mobbs
Moberly
Mohican
Moloch
Monroe
*Mooyie*
Morrissey
*Mosquito*
*Mouse*
Moyie
Mud
*Mud*
Mulvey
Mummery
Nakimu
Nakusp
Naumulten
Nelson
Nemo
Neptuak
Nettie L.
Niles
Niord
Norbury
Norns
North Albert
*North Branch* (Kicking Horse R.)
North Fork
*North Fork* (Cooper Cr.)
*North Fork* (Cross R.)
*North Fork* (Fry Cr.)
*North Fork* (Lardeau Cr.)
*North Fork* (Michel Cr.)
*North Fork* (Yoho R.)
North Kootenay (pass)
North Star (hill)
*Novelist*
*Number 2* (creek)
*Number 3* (creek)
Odaray
Odin
Oesa
Ogden
Ogre
O'Hara
Oke

## BRITISH COLUMBIA—*Continued.*

**Kootenay**—*Con.*

Oliver
Otterhead
Ottertail
Owen
Paget
Palisade
Palliser
Palmer
Palmer Bar
Park
Pearce
Peavine
Pend-d'Oreille
Perley rock
Perry
Phillipps
Pilkington
Pilot
Pingston
*Pinnacle*
*Pirate*
Pitt
Plumbob
Pollinger
Popes
Poplar
Porcupine
President
Privateer
Procter
Pudding
Purity
Pyramid
Rainy
Ravelin
Redan
Redburn
Redding
Reno
Reserve
Revelstoke
Ridgeway
Rinda
*Ripple*
Robertson
Robson
*Rock*
Rogers
Rory
Rose
Ross
Ruby
Russel
*Rykerts*
St. Eugene
St. Mary
Salmo
*Salmon*
Sand
Sanderson
*Sanderson*
Sangrida
Sapphire
Sarbach
Saugum
Sawyer
Scalping Knife
Schaffer
Schroeder
Scullion
Seaton
Selkirk
Selwyn
Seraph
Sharp
Shaughnessy
Sherbrooke
Shields
Sifton
Silvercup
Silvertip
Simpson
Sinclair
Sir Donald
Sir Sandford
*Six-mile*
*Skirmish*
Slade
Slocan
Smart
Snowslide
Sodalite
Solitude
Sonata
Sophia
Sorcerer
*B. Br. or Fork* (Michel Cr.)
*S. Fork* (Findlay Cr.)
*S. Fork* (Gold Cr.)
*S. Fork* (Grave Cr.)
*S. Fork* (Salmon R.)
*S. Fork of Mid. Fk.* (Spillimacheen R.)
Spike
Spillimacheen
Spirit
Sproat
Spyglass
Stanford
Stanley
Starvation
Steamboat
Steele
Steep
Stephen
Stevens
Stockmer
Storm
Sugarloaf
Sullivan
Sunshine
Swan
Swanzy
Swiss
Syringa
Tabernacle
Tackle
Takakkaw
Tallon
Taylor
Tea
Templeman
Templeton
Tenderfoot
Tent
Terminal
The Bishops
The Dome
The Monarch
The Needles
The Overlook
The President
The Rampart
*The Stragglers*
The Steeples
The Vice President
Thor
*Thumb*
Thunderhill
Tilley
*Toba*
Toby
Tokumm
Tonkawatla
Topham
*Torrent*
Tower
Tracy
Trident
Trolltinder
Trout
Truda
Tulip
Tupper
Turret
*Twenty-five mile* (Cr.)
Twin
Two-bit
Upper Arrow
*Upper Clearwater*
*Upper Emerald*
*Upper Kootanie*
Urd
Ursus Major
Ursus Minor
Uto
Valhalla
Valkyr
*Van Hooven*
Van Horne
Van Houten
Vaux
Ventego
Vermilion
Vertebrae
Vertical
Victoria
Vidette
Vingolf
Vowell
Wagner
Waitabit
Walker
Wallenger
*Wapateehk*
Wapta
*Wapta*
Waputik
Wardner
Washmawapta
Waterfall
Weaver
Wedgwood
Wenkchemna
*W. Brch.* (Gold R.)
Westfall
*W. Fork* (Bull R.)
*W. Fork* (Duncan R.)
Whaleback
Whatshan
Wheeler
White
*Whitefish*
White Grouse
White Man
*Whymper*
Wigwam
Wild Horse
Wilkie
Willet

## BRITISH COLUMBIA—*Continued.*

### Kootenay—*Con.*

*Williams*
Willowbank
*Wilson*
Windermere
Wiwaxy
Woden
Wonder
Woodbury
Worthington
Wotan
Yahk
Yarrell
Yoho
Yukness
Zinc

### Lillooet.

*Alexander*
Anderson
*Babb*
Bendor
Birkenhead
Bobb
Brew
Bridge
Cadwallader
*Cayoose*
Cayoosh
*Chilco*
*Chilcote*
Chilcotin
Chilko
Currie
Duffy
*Eagle*
Fergusson
Fraser
*Great Fish*
*Green*
Gun
*Gunn*
Hanceville
Horse
Hurley
Keary
Lillooet
*Lorne*
McGillivray
*McGillvary*
McLean
Marble
Marshall
Mission
*Na-a-ma*
Nemaia
*N. Fk.* (Bridge R.)
Pearson
Pemberton
Penrose
*Pool*
Poole
*Portage*
Rex
Riske
Roches
*Seaton*
Seton
Sheba
Sheridan
Shulaps
*S. Fk.* (Bridge R.)
*Sucker*
*Taseco*
Taseko
Tatlow
*Thomas Green*
Tommy
*Tranquille*
Truax
Tyaughton
Whitecap
*Whitewater*
Yalakom

### New Westminster.

Active
Alouette
Ballenas
*Ballinac*
*Blanchard*
Blanshard
Boundary
Brackendale
Buntzen
Burrill
Cain
Campbell
Capilano
Cheakamus
Chilliwack
Collenson
Cultus
Daisy
Descanso
*Discovery*
Duke
Fraser
Galiano
Georgia
Green
*Houston*
Houstoun
Huntingdon
*Knight*
Kuper
*Lasketti*
*Lasquely*
Lasqueti
*Lillooet*
Lynn
*Malaspina's*
Matthews
Mayne
Miles
Mouat
*Mouatt*
Parson
Pender
Plumper
*Plumper's*
Porlier
*Portier*
Prevost
Rip
*Rocky*
Rosenfeld
Ruth
*Schooner*
Seechelt
Semiamu
Seymour
Squamish
Sumas
*Sumass*
*Swehl-tcha*
*Tahtaloo*
Tamihi
*The Golden Ears*
Tinson
*Trout*
*Tummehai*
Valdes
Vananda
Vedder
Whaler

### Osoyoos.

Bobbie Burns
*Deep creek*
Gold
Kettle
Mabel
*Shoushwap*
Shuswap
*Spallumcheen*
Trepanage
*Trepanier*

### Peace River.

Fort Nelson
Fort St. John
Liard
Moberly
*Moberley*
Muskwa
*Nelson*
Peace
Prophet
*Sicannie Chief*
*Sikanni*
Sikanni Chief
Tetsa

### Similkameen.

Allison
Arlington
Ashnola
*Beaver*
Beaverdell
Boundary
Bradshaw
Burrel
Cahill
Carmi
Carson
Cascade
China
Crystal
E. Br. N. Fk. (Kettle R.)
E. Fk. W. Fk. (Kettle R.)
*Eighteen Mile*
Ferroux
*Fifteen Mile*
Granby
Grand Forks
*Graveyard*
Hall
Hardy
Hedley
Kettle
King Solomon
Midway
Mosher
*N. Fk.* (Kettle R.)
*One Mile*
Osoyoos

## BRITISH COLUMBIA—*Continued.*

**Similkameen—***Con.*

Pasayten
St. John
Similkameen
Sophia
*S. Fork of Beaver* (creek)
*S. Similkameen*
*Squakum*
Trapper
*Twenty Mile*
Wallace
*W. Fk.* (Kettle R.)
Westkettle
Wilkinson

**Vancouver Island.**

*Admiral*
Albert Edward
*Anderson*
*Arbutus*
Arnet
Arrowsmith
*Bamfield*
Banfield
*Barclay*
Barkley
*Baynes*
Bazan
Becher
Beck
*Beddingfield*
*Beecher*
Beechy
*Beeghados*
Belcher
Benson
Bentinck
*Big Saanich*
Blinkhorn
Bluff
Booth
*Boulder*
Brabant
Braden
Brandon
Brenton
Broom
Brotchie
Bruce
Buck
Burgoyne
Burial
Burleith
Cassidy
*Cattle*
Chase
*Chase River Crossing*
Chemainus
*Chemainus*
Cherry
*Chuan*
Church
Clayoquot
*Clayoquet*
Cluster
*Coal*
Cobble Hill
Coffin
*Colborne*
*Colbourne*
Colburne
Collins
Commerell
*Commerell*
*Conspicuous*
Conuma
Cordova
*Cordova*
*Cormorant*
Coronation
Cottle
Cowichan
*Cowichan*
*Cowichin*
*Cowitchin*
Crown
Dayman
Deadman
De Courcy
Demaniel
Departure
Dodd
Donaldson
*Double*
Douglas
*Douglas*
Duffin
Duncan
Dunsmuir
Edgell
Edmund
Effingham
Empress
Entrance
Erskine
*Execution*
Extension
Fairway
False
Felice
Finlayson
Fleet
Francis
*Fraser*
Frazer
Fuller
Gabriola
*Galiano*
Gallows
Garibaldi
Georgia
Glacier
Goldstream
Gonzales
Grice
*Guaquina*
Hall
Halsted
Hammond
Haslam
Hayes
Hecate
Henderson
Hoggan
Holden
Holland
*Horse Shoe*
Horswell
*Howe*
Hudson
Icarus
Impérieuse
*Inner*
Jack
*Jack's*
James
Jeffrey
Jesse
Joan
Jocelyn
Jordan
*Karmutsen*
Kirby
*Kla-anch*
Koksilah
Kulleet
Ladysmith
Lagoon
Langford
*Leading peak*
Leboeuf
Leech
*Lighthouse*
Link
Lock
*Long*
McDonald
McKay
*McLaughlin*
McLoughlin
Maguire
Malahat
Maple
Matheson
Maxwell
Metchosin
Michael
Moresby
Mouat
Mouatt
Muchalat
Mudge
Muir
Nanaimo
Nankivell
Nares
*Narrow*
Neck
Neilson
Nigei
Nimpkish
*Nixon*
*North Peak*
Northumberland
Norway
Opitsat
Osborn
Otter
*Oyster*
Pachena
Page
Parkins
Parry
Pedder
Pender
*Pender*
Piers
Pilot
Pimbury
*Pinbury*
*Point-no-point*
Portland
Possession
Prevost
Protection
Quadra
Quamichan
Race
Ragged
Ranch

## BRITISH COLUMBIA—*Concluded.*

**Vancouver Island**—*Con.*

Redflag
Reid
Retreat
Richard
Richards
*Round*
Royal
Saanich
Saanichton
Saddle
*Saddle*
St. Mary
*St. Patrick's*
Saltspring
San Josef
San Juan
San Miguel
Sansum
Satellite
Secretary
*Secretary*
Separation
Shaft
*Sharp*
Shawnigan
Shepherd
Sheringham
*Sherringham*
*Shotbolts*
Shute
Sibell
Sidney
Skinner
Skirt
Snake
Somass
Somenos
Sooke
South Wellington
Spring
Squally
Stockham
Stone
Stuart
*Sumass*
Survey
Sutil
Swanson
*Sydney*
Thetis
Tod
Towincut
Trap
Tofino
Trincomali
*Trois Bras*
Tugwell
*Twin*
Tyne
Tzuhalem
Union
Usatzes
Vernon
Vesuvius
Victor
Victoria
Wallace
Wallis
Wark
Waugh
Westholme
Whiffen
Whymper
William
Wilson
*Wilson's Crossing*
Wood
Woods
Woodley
*Work*
Yellow
Zachariah

**Yale.**

Zero
Britton
Chilliwack
Coquihalla
*Eagle*
*Fish*
Fraser
Granite Creek
Grasshopper
Henning
Hozameen
Jackson
Klesilkwa
Kwoiek
*Loadstone*
Lodestone
Murphy
Nepopekum
Nohomin
Olivine
*Paradise*
Pasayten
Quartet
*Quoieek*
Rabbitt
Riddell
*Roach*
Roche
Shawatum
Silver
Similkameen
Skagit
*S. Similkameen*
Spearing
*Steamboat*
Sumallo
Tulameen
Uztlius
Whipsaw

## MINING DIVISIONS IN BRITISH COLUMBIA.

Ainsworth
Alberni
Arrow Lake
Ashcroft
Atlin
Bella Coola
Cariboo
Clayoquot
Clinton
Golden
Grand Forks
Greenwood
Kamloops
Lardeau
Liard
Lillooet
Nanaimo
Nelson
New Westminster
Nicola
Omineca
Osoyoos
Peace River
Portland Canal
Quatsino
Queen Charlotte
Quesnel
Revelstoke
Similkameen
Skeena
Slocan
Slocan City
Steele
Stikine
Trail
Trout Lake
Vancouver
Vernon
Victoria
Windermere
Yale

## MANITOBA.

*Albert*
Alexander
Anderson
Antler
Apeganau
Apussigamasi
Armit
*Armitt*
Asham
Asippitti
Athapapuskow
*Atic-a-make*
Atikameg
*Bad Throat*
Bald Eagle
*Basquia*
*Bear*
*Beaver-dam*
Bélanger
Berens
*Big*
*Big Black*
*Big Cutarm*
*Big Reed*
Birch
*Bird*
Birds Hill
Birdtail
Birtle
Black

## MANITOBA—*Continued.*

**Manitoba**—*Con.*

*Black*
Bloodvein
*Blue hills of Brandon*
Bowsman
*Boyne*
Brandon
Brereton
Brokenhead
Brokenmouth
Burntwood
Burton
Cedar
Childs
Churchill
Claude
*Clear Water*
*Cold*
Coleman
Contact
Cormorant
Cowan
Cranberry
Crane
Cross
Cutarm
*Cypress*
Dauphin
Dawson
Deer
*Deer*
Doghead
*Dog's Head*
Dolomite
Drifting
Drumming
Duck
*Duck*
*Duck River N.*
*Duck River S.*
Dunsckikan
*East*
*East Doghead*
Ebb-and-flow
Echimamish
Elbow
*English*
Fairford
File
Fisher
Footprint
Fork
Gainsborough
Gods
Graham
*Grand*
Granville
Grass
*Grass*
*Great Black*
*Grenville*
Grindstone
Hayes
*Hay's*
Headingley
Hecla
*Herb*
High Bluff
Hill
*Hill*
*Hole*
Hudson
Huns Valley
Icelandic
*Indian*
*Indian Pear Island* (lake).
Island
*Isles de Bois*
*Ithenotosquan*
Jackhead
Jackson
*James Ross*
Kematch
Kiskitto
Kiskittogisu
Kisseynew
Kississing
Kiwanzi
Landing
LaRivière
Laurie
Lawrence
*Le Pas*
Lily
*Limestone*
*Little Black*
*Little Saskatchewan*
*Lobstick*
*Long*
Loonhead
Lorette
Lorne
Louise
McCreary
Manasan
Manigotagan
Manitoba
Mantagao
*Manuminan*
Maskwa
Matheson
Methy
Minago
Minitonas
Minnedosa
Minnewakan
*Missinnippi*
Missipisew
Mitishto
Moose
Moosehorn
Morris
Mossy
*Mountain*
*Muddy Water*
Muhigan
*Munosahn*
*Muskrat*
Namew
Nelson
Netley
*Net Setting*
*Nipuwin*
*Niskitogisew*
*Nistowasis*
*Norris*
*North Antler*
North Duck
Northwest Angle
Oak
Oakbank
Odei
Olseau
Onatuwi
Onatamini
*Ooskootim*
Opegano
Ospwagan
*Outer Sturgeon*
Overflowing
Paint
Pakwa
*Pakwahigan*
*Paquehigan*
*Partridge Crop*
Pas
Pasquia
*Payoonan*
Pembina
Pentamerus
Peonan
*Pine*
Pineimuta
Pineroot
*Pipe*
Pipestone
*Pipestone*
Plum
Point
*Pokkattawagan*
Poplar Point
Portage
Portage-la-Prairie
Pruden
*Puke-lowogein*
Pukkatawagan
Punk
*Punk*
Qu'Appelle
*Rapid*
*Rat Portage* (lake)
Reader
Red Deer
Reed
*Reeder*
Reindeer
Richard
Riding
Roaring
*Rolling*
Roseau
Ross
Sagemace
*Sahpoochaway*
St. Andrew
St. David
St. George
St. Martin
St. Patrick
*Sandy*
*Saskatchewan*
Saskerani
*Scratching*
Segatiga
*Sepewesk*
Setting
Shell
Simonhouse
*Singoosh*
Singush
Siplwesk
Sisipuk
*Slave*
Sleeve
*Snake*
Souris
*South Antler*
South Duck
Southern Indian
Spence
Split

## MANITOBA—*Concluded.*

### Manitoba—*Con.*

*Squirrel*
*Steel*
Steeprock
Swan
*Sweet Herb*
*Takipy*
Teal
*The Big* (slough)
*The Elbow*
*The Pas*
Threepoint
Tramping
Traverse
*Trout*
Turnagain
Turtle
Valley
Vankoughnet
Violadale
Wabishkok
Wanipigow
*Wapichtigow*
Wapishtigau
Warpath
Washow
*Waskaiowaka*
Waskatowaka
Waskik
*Waskiktepigo*
*Waskwatim*
Watchi
Waterhen
*Weir*
Wekusko
*Wepiskow*
*West*
Westbourne
*West Dog Head*
*West Niskitogisew*
Whitemouth
Whitemud
Whiteshell
Whitewater
Whiteway
Wilson
Wimapedi
Windy
Winnipegosis
Wintering
Witchai
*Wolf*
*Wolf Rand*
Wood
Woody
Wuskatasko
Wuskwatim
Yawningstone

## NEW BRUNSWICK.

### Albert.

Albert
*Baltimore*
Beech Hill
*Big*
*Cap de Moselle*
Chignecto
Crossman
Demoiselle
Edgett
Enrage
*Golden Mountain*
Gowland Mountain
Gray
*Grey*
*Hopewell Corner*
Irving
*Niagara*
*Petcoudiac*
Petitcodiac
Point Wolf
*Rougie*
Roxburgh
Salisbury

### Carleton.

Becaguimec
Beechwood
*Bumfrau*
*Maduxnakeag*
*Manquart*
Mars Hill
Meduxnekeag
Monquart
*Munquart*
Newburg
*Newburg Junction*
*Peckagomique*
Presquile
Richmond
*Richmond Corner*
Rivière-des-Chutes
*Shictahawk*
Shiktahawk

### Charlotte.

*Belas*
Campobello
*Campo Bello*
*Canous*
*Canouse*
Deadman
*Etang*
*Flag, Flag's or Flagg's*
Grand Manan
*Grand Manan*
*Harbour de Lute*
Kanus
Lepreau
L'Etang
*L'Etete*
Letite
Loutre
Mace
Mascabin
Mascareen
*Mascarin*
*Mehollan*
*Meholland*
*Menan*
Midjik
*Mijic*
Mulholland
North Head
*North Road*
*Paskckegan*
Piskahegan
Rollingdam
St. Andrews
St. Stephen
Watt
*Watt Junction*
Welshpool

### Gloucester.

*Alemek*
*Baie des Chaleur*
Bartibog
Caraquet
*Caraquet*
*Caron*
Carron
Chaleur
Elmtree
Flemming
Grande-Anse
Green Point
Lamek
Laplante
Limestone
*Little Nipisiguit*
Maisonnette
*Mezonet*
Millstream
Miltonbrae
Miscou
*Mizonette*
*Mizzenette*
Mya
*Mya*
*Nepisiguit*
*Nickadow*
Nigadu
Nipisiguit
*Nipisiguit Millstream*
*North Mya*
Petit Rocher
*Pockmouche*
*Pocmouche*
Pokemouche
Pokesudi
Shippigan
*S. Brch. Little* (river)
*South Mya*
Tetagouche
*Teteagouche*
*Young's*

### Kent.

Cocagne
Galloway
*Galway*
*Kingston*
Macdougall
Molus
*Moulie's*
*New Galloway*
*New Galway*
Pelerin
Point Sapin
*Puellering*
Rexton
St. Mary
St. Paul

## NEW BRUNSWICK—*Continued.*

### Kings.

Newtown
*Pequaket*
Philmonro
*Pickwaket*
Pikwaket
Quispamsis

### Madawaska.

*Gounamitz*
Gunamitz
*Little Fork*
*Waagan*
Wagan

### Northumberland.

Barnaby
Cain
Cain River
*Kains*
Mamozekel
Miramichi
*Mirimichi*
*Momozekel*
*Nepisiguit*
Nipisiguit
Rivière-des-Caches
Rogersville
Stratharbo
*Tabasintac*
*Tabisintac*
Tabusintac

### Queens.

Gaspereau
Grimross
Washademoak
*Washedemoak*

### Restigouche.

*Baie des Chaleur*
Campbellton
Chaleur
*Cold Brook*
Colebrooke
*Dawsonvale*
Dawsonville
*Gounamitz*
Gunamitz
Kedgwick
*La Lime*
Lanim
*Le Nim*
*Little Fork*
*Little Tobique*
Nictor
*Quatawamkedgewick*
Restigouche
*Ristigouche*

### St. John.

Courtenay
Lorneville
McCoy
Manawagonish
Martin
*Maspeck*
*Michepasque*
*Mispec*
*Mispeck*
Mispek
*Misshapec*
*Mizpeck*
*Pisarinco*
Quaco
*Quaco*
*St. Martin*
St. Martins
Thompson

### Sunbury.

Gaspereau
Oromocto
*Oronocto*
Portobello
Rusagonis
*Rushagornis*

### Victoria.

Aroostook
Arthuret
Campbell
Ennishone
*Ennishore*
*Gounamitz*
Gulquac
Gunamitz
*Little Fork*
*Little Tobique*
Mamozekel
*Momozekel*
Nictau
Odellach
*Otelloch*
Rapide-de-Femme
*Right Hand Brch. Tobique R.*
Riley
Sisson
Tobique
*Tobique*
Trousers
*W. Brch. Tobique R.*

### Westmorland.

Aboushagan
Aulac
Baie-Verte
*Bay Verte*
Belliveau
Berrys Mills
*Boyd*
Bristol
Chignecto
*Folly*
Fort Folly
Gaspereau
*Gaudet*
*Great Shemogue*
Grindstone
Jolicœur
Léger
*Legère Corner*
Lutz
Missaguash
*Misseguash*
*Missiguash*
*Missiquash*
*Oulac*
Painsec
*Petcoudiac*
Petitcodiac
*Point de Bute*
Pont-à-Buot
Shemogue
Sunny Brae

### York.

Becaguimec
Brockway
*Brookway*
Chiputneticook
*Coac*
Koak
McAdam
*Nacawicac*
Nackawic
Newmarket
Oromocto
*Oronocto*
*Peckagomique*
*Pocowagamis*
Poklok
Pokowagamis
*Poquiock*
*Sheogomoc*
Shogomoc
Springfield
Springhill
Stanley
*Stanley Village*
Taxes
*Taxis*
*Taxous*
*Texas*

## NORTHWEST TERRITORIES (Unorganized)

*A. H. Ward*
Akpatok
Akuling
Allen
Anderson
Archibald
*Ark-e-leeuik*
Asho
Ava
Axel Helberg
Backs
*Back's Western*
Baffin
Banks
*Baring*
Bathurst
*Bear*
Beaumont
Bedford
Beckman
*Best*
Bishop
Blanford
Blunt
Bonney
Boucanquet
Beavoort
Bruce
Butler

## NORTHWEST TERRITORIES (Unorganized)—*Concluded.*

Button
Carys Swan Nest
*Cathawhachaga*
Chamberlain
Charles
Chase
Chorkbak
Christie
Chudliasi
Church
Clark
Clements Land
Clinton-Colden
Cockburn
Colmer
*Copper Indian*
Cornwall
Cornwallis
Countess Warwick
*Crete*
Crooks
Cumberland
Cyrus Field
Dahadinni
Delthore
Devon
Diamond
Doctor
*Doobaunt*
Dubawnt
*Dyer*
Earl Grey
East
Edith
Eduni
*Egypt*
*Ehkwee*
Eider
Ekwi
Ellesmere
Emma
Fair Ness
Findlay
*Finlay*
Fisher
Fletcher
*Fort Good Hope*
*Fort Norman*
*Fort Providence*
*Fort Resolution*
*Fort Simpson*
*Fort Wrigley*
Fox
*Fox*
*Foxe*
*Frank Clark*
Frobisher
Gabriel
Glasgow
Glencoe
God's Mercie
Gods Mercy
Good Hope
Gordon
Govan
Gravel
Great Bear
*Great Fish*
Great Slave
Greenwood Land
Grey Goose
Griffin
Grinnell
Hall
*Harbour*
Hatton
Haven
Hector
Henderson
*High*
Hill Island (lake)
*Hogarth*
Home
Icy
Inlin
*Innarulligang*
Irving
Jacob
*Jackman*
James
Jordan
Jubilee
Julian
*Ka-lik-took-duag*
*Kangerflung*
Kathawachaga
*Katutok*
Keele
*Khartum*
*King Christian*
King William
*Kitigtung*
Klewi
Kneeland
Korikduardu
Lady Franklin
Laurier
Leopold
Liard
*Little Charlton*
Lockhart
Loks Land
Lower Savage
Lubbock
*Luke Fox*
*Lumley*
Macdonald
Maiden
Mansel
*Mansfield*
Markham
Middle Savage
Montrose
Monumental
Moses-Oates
*Mountain*
Murchison
Murray
Nainlln
Natla
Nauyats
Newell
Newton
Nidhe
Noel
Norman
North
*North Cornwall*
*North Devon*
*North Foreland*
*North Somerset*
*Northumberland*
*Nusheth*
Nyarling
Olga
Overflow
Pauktorvlk
*Penny*
Pethlnue
Plover
Prince Albert
*Prince Arthur Land*
Prince of Wales
*Prince of Wales*
Prince Patrick
Pritzler
Providence
Queen Elizabeth
Ramsay
Rawson
Reeves
Resolution
*Resolution*
Ringnes
Robert
Robinson
*Rocher*
*Rock*
Roes Welcome
Ross
*Rowes*
Saddleback
Sass
*Sass-tessi*
*Savage*
Sayunei
Sekwi
*Setidgi*
Shezal
*Siggia*
Simpson
*Sir E. Home's*
*Sir Thomas Rowe's Welcome*
Sitidgi
Solomons Temples
Somerset
Spicer
Strathcona
Sylvia Grinnell
Taltson
Tazin
*Tchork-back*
*Tess-Clewee*
*The-cul-thi-li*
Thekulthili
*Thelew*
Thelon
*Thleweechodezeth*
*Toohoolitas*
*Tornait*
Trodely
Tsichu
Tsu
*Tudjakdjuan*
*Tudjakdjudusirn*
Tuhulitas
Twitya
Upper Savage
Victoria
Waddell
Wales
Ward
Warwick
Westbourne
Western
*West Fox*
Wharton
White
White Bear
Wholdaia
Wollaston
*Wollaston Land*
Wrigley
*Yellow Knife*
York

# NOVA SCOTIA.

## Annapolis.

*Cegemecega*
Chute
Delap Cove
Kejimkujik
Margaretville
*Marshall Cove*
Port Lorne
*Port William*
*Segum Sega*

## Antigonish.

George
*Harbour au Bouche*
Havre Bouché
*St. George*

## Cape Breton.

*Big Loran*
*Big Lorraine*
Bras d'Or
Clark
*Cow*
*Cow Bay* (village)
Flat
Fourchu
Gabarus
*Gabarouse*
Great Bras d'Or
*Great Bras d'Or*
Little Bras d'Or
*Little Loran*
Little Lorembec
*Little Lorraine*
Lorembec
Low
*Low*
Mainadieu
*Menadou*
Morien
*Morien Bay* (village)
*Murgin*
*Neal*
Nell
*Peter's*
*Petre*
Petrie
*Petrie's*
Port Morien
St. Andrew
Seatarl
Winging
*Wining*
*Winning*

## Colchester.

*Basin of Mines*
Debert
*Debert*
Kemptown
Masstown
Minas basin
*Mines basin*
*Partiplique*
Portaplique
Waughs

## Cumberland.

*Basin of Mines*
Chignecto
*Chinimicash*
Conn Mills
D'Or
*Dore*
Joggins
*Macan*
Maccan
Minas basin
*Mines basin*
Parrsboro
Philip
*Phillip*
Salem
*Salent*
Shinimikas
*Shoulie*
Shulie
*South Joggins*
*South Joggings*

## Digby.

Bear
Belliveau
Brier
*Bryer*
*Hebert*
*Metaghan*
Meteghan
Meteghan Station
Prim
*Rogers*
St. Mary

## Guysborough.

Caledonia
Charlo
*Charlo's Cove*
Country
*Crow Harbour*
Green
Isaac Harbour
Liscomb
*Middle Caledonia*
*Newton*
Newtown
Port Bickerton
Queensport
Sherbrooke

## Halifax.

Barrie
Big Thrumcap
*Black Duck Run*
Boutilier
*Boutillier*
*Brian*
Brine
Caribou Mines
*Catch*
Clarke
Cleaveland
*Cleveland*
Coachman
*Coolen*
Coonan
*Covey*
Coyle
Dauphinee
*Dauphney*
*Dover*
Doyle
Eisner
*Eisenhaur*
Elderbank
Fleming
Frederick
Frostfish
George
*Grampus*
*Grand*
Hackett Cove
*Haggert*
Harbour
Hosier
Hubbards
Hubley
*Hubly*
*Isnor*
Ketch
*Kieley*
Kitiwiti
Leary
Lichfield
*Litchfield*
*Little Musquodoboit*
*Little River Musquodoboit*
Mauger
*Meagher*
Mosher
Myra
Navy
*Oakland*
*Osier*
Peggy Cove
*Perpisawick*
Perrang
*Perrin*
Petpeswick
*Pine Wood*
Ponhook
*Reed*
Reid
*St. Croix*
St. Margaret
Schnare
*Shad*
Shag
Sheehan
*Shehen*
Shubenacadie
Slaughenwhite
*Smith*
*Snares*
*Stephens*
*Stevens*
*Stony*
*Tangier*
Taylor
*Tenants*
Terence
*Tern*
Thom
Thrumcap
*Tom*
Tun
*Turner*
*White*
Wynott

## NOVA SCOTIA—*Concluded.*

### Hants.

*Basin of Mines*
Cheverie
*Chiverie*
*Cockmagun*
*Cockmigun*
Cogmagun
*Grand*
Hennigar
*Joshua Hennigar*
*La Tete*
Minas basin
*Mines basin*
*Northfield*
*Petite*
Ponhook
St. Croix
*St. Croix*
Shubenacadie
*Tenecape*
Tenny
Tennycape
*Teny*
*Tenycape*
Threemile Plains
Walton
*Weir*

### Inverness.

Balache
*Belache*
*Belhache*
Bras d'Or
Cheticamp
*Cheticamp Harbour*
*Dennis*
Denys
Eastern Harbour
*Eastern Harbour*
Grand-Etang
*Great Bras d'Or* (lake)
Henry
Low
*McMillan*
Margaree
*Outer*
*Outer I. of Port Hood*
*Plaster Cove* (pt.)
Port Hood
Port Hood Island (P.O.)
River Denys
St. Patrick
*Smith's*
*W. D. Smith's*

### Kings.

*Basin of Mines*
Baxter Harbour
Billtown
*Canaan*
Chipman Corner
Coldbrook
Hall
Hall Harbour
*Indian*
Kinsman
Longspell
Meehin
Minas basin
*Mines basin*
New Canaan
*North Corner*
Norths
Scotsman
Sheffield Vault
Split
Square
*Square Cove*
Wheaton Vault
Whiterock
*White Rock Mills*
Whites
*White's Corner*

### Lunenburg.

*Aspatagoen*
Aspotogan
Coleman
Dares
Dauphinee
*Dauphney*
Gaetz
*Green*
Hobson
*Indian*
Lahave
*Le Havre*
Meisner
*Misener*
Pearl
Upper Lahave

### Pictou.

Barney
Barney River
*Big*
East
John
Merigomish
Middle
River John
West
*West river of Pictou*

### Queens.

*Cegemecega*
Fairy
Joli Head
Kejimkujik
Medway
Port Joli
*Port Matoon*
*Port Medway*
*Port Metway*
Port Mouton
*Segum Sega*

### Richmond.

*Ardoise*
Bras d'Or
*Creighton*
Crichton
D'Escousse
*Discousse*
Dog
Framboise
*Freestone*
*George*
*Gooseberry*
*Great Bras d'Or* (lake.)
Green
Gregory
*Habitants*
Inhabitants
Janvrin
*Jauvrin's*
L'Ardoise
*La Ronde*
Marjorie
Petitdegrat
*Petit Degrat*
*Petit de Grat*
Poulamon
Rond
*Round*
St. George
*Seal*

### Shelburne.

Barrington
Barrington Passage
*Big Port l'Hebert*
Cape Negro (island)
Cape Negro Island (P.O.)
Emulous
*Emulow*
*Head of Jordan* (river)
Jordan River
Locke
Lockeport
McNutt
Negro
*Negro*
*Port Ebert*
Port Hebert
*Port L'Hebert*
Port Latour
*Ragged*
*Ragged Island* (harbour)
*Rugged*
*Rugged Island* (harbour)
Shelburne
*Shelburne Harbour*
*West Passage*

### Victoria.

Aspy
*Bird*
Boularderie
Bras d'Or
Ciboux
Great Bras d'Or
*Great Bras d'Or* (lake)
*Hiboux*
Indian
*Inganish*
Ingonish
Munro
*Niganishe*
St. Andrew
St. Ann
St. Patrick

### Yarmouth.

*Cegoggin*
*Chagoggin*
Chegoggin
*Great Tusket*
*Green Cove*
*Maitland*
Port Maitland
Tusket
*Tusket Wedge*
Wedgeport

# ONTARIO.

## Addington.

Ashby
*Big*
Effingham
*Island*
*Little Weslemcoon*
Weslemkoon
Wilton

## Algoma (district).

Agawa
*Bachéwanaung*
*Bagutchuan*
Batchawana
*Blind*
Bridgland
*Brulé*
Chiblow
*Chippewa*
*Clear*
Coldwater
*Corbay*
Corbeil
*E. Branch Thessalon R.*
Endikai
Grand
*Grasett*
*Harmonie*
Harmony
Hilton
*Jackson*
Jones
*Kaikaquabick*
Kenogami
*Macoming*
*Madendanada*
Magog
Marksville
*Matinativdo*
Michipicoten
*Misinabi*
*Missanabie*
Missinalbi
Mississagi
*North Lizard*
Pagwachuan
*Pakowagaming*
*Pakowcaming*
Pakowkami
*Parisian*
Parisienne
*Patauquin*
*Pawghtchewan*
*Pawgutchewan*
Pegamasai
Petauguin
*Powgulchuan*
Reception
Robertson
Rowe
St. Mary
*Shookum*
Skookum
Superior
Tendinenda
*Waagoosh*
*Wahblquckobing*
*Wahcomatagaming*
*Wahquckobing*
Wakoimata
Wakwekobi
Waugush

## Brant.

Alford
*Alford Junction*
Eaglenest
*Middleport*
Mohawk
*Mt. Pleasant*
Nith (river)
*Smith's* (creek)
Tuscarora

## Bruce.

Arbutus
Argyle
Bad Neighbour
Baptist
Barrett
Beament
Belcher
*Birch*
Boyer
Burke
Campbell
Cataract
Cavalier
Chantry
Chiefs
China
Cigar
Clark
Corisande
Cornet
Corsair
Cove
Cove Island
Crab
Dack
Dane
Doctor
Dorcas
Doré
Douglas
Eagle
Earl Patches
Echo
Evelyn
Fishing
Flowerpot
Gat
Gauley
Georgian
*Gheghcto*
Gilphie
Golden
Greenfield
Greenough
*Gull*
Gunn
Hopkins
Horton
Huntress
Hurd
Inverhuron
*Isle of coves*
Johnston
Juno
Kineardine
Knife
Kolfage
Lambert
Lee
Lionhead
Logie
Loscombe
Lyal
McCallum
McElhinney
MacGregor
McNab
Macpherson
McRae
Mad
Main
Malcolm
Milton
Parker
Penetangore
*Pine*
Pine Tree
Porcupine
Port Elgin
Ragged
Red
Reid
Ripple
Russel
Saturn
Saugeen
Saxon
Scott
Scougall
Scout
Seasbell
Shute
Sibert
Simon
Smokehouse
*Snake*
Southampton
Stokes
Stony
Tecumseh
Terry
Tobermory
Tolmie
Turning
*Twin*
Vrooman
Wanderer
Warner
Warren
Wells
Welsh
Wreck
Youell
Zinkan

## Carleton.

Bells Corners
Britannia Bay
*Britannia-on-the-Bay*
Buckham
Dwyerhill
Goulbourn
*Hardwood Plains*
Harwood Plains
*Hemlock*
Herbert Corners
Hurdman
*Hurdman's Bridge*
Jockvale
Johnston Corners
Limebank
Mackay

## ONTARIO—*Continued.*

### Carleton—*Con.*

Orleans
Ottawa
Remic
*Remous*
Rockcliffe
*Rockliffe*
*St. Joseph d'Orleans*
Stanley Corners
Stittville
Westboro
Woodroffe

### Dundas.

Bouckhill
Brinston
*Brinston's Corners*
Dixon Corners
Farran Point
Froatsburn
Galop
*Little Nation*
*Nation*
Newross
*Petite Nation*
Reid Mills
South Nation
Toussaint
*Toussons*
Toyehill

### Elgin.

Aldborough
Aylmer
Big Otter
*Big Otter Creek*
Glencolin
*Otter*
Port Burwell

### Essex.

Edgar
*Edgar's Mills*
Fighting
*Isle aux Pêches*
Peach
Pelee
*Pointe Pelee*
Puce
Ruscom
St. Clair
St. Joachim

### Frontenac.

*Afazon*
*Ambella*
Arabella
Barrett
Bayfield
*Big*
*Blunder*
*Bolivia*
*Brown's*
Carpenter
Cataraqui
Cedar
*Deep Eau*
Depot
Ferguson
*Ferguson*
Francis
Frederick
*Gage*
Garden
Gates
*Great Cataraqui*
Grog
*Halliday*
Henry
*Hickory*
*Hinckley*
Holliday
Horseshoe
Howe
Johnson
Knapp
*Levi*
*Little Cranberry*
*Long*
*Marysville*
Melville
Milton
*Mud*
Myles
Ninemile
*Pearson's*
Penitentiary
*Prince Regent*
Quebec
*Royal George*
*Seven Acre*
*Spardan*
Spit
Traverse
Upper Rock (lake)
Wilton
Wolfe
Wolfe Island (Tp. and Vil.)

### Glengarry.

Baudet
*Beaudet*
*Black*
*Bodet*
Cashionglen
Colquhoun
*Craigs*
Delisle
Garry
Glenbrook
Glengarry
Glennevis
Glenroy
*Graisse*
Grant Corners
*L'Isle*
*Mouile*
*Mouille*
Mouillée
Munroe Mills
Raisin
Rigaud
*Riv. aux Raisins*
St. Raphael
Stanley
*Stonehouse*

### Grenville.

Acton Corners
Bishop
*Bishop's Mills*
Burritt Rapids
Easton
*Easton's Corners*
Kemptville
*Little Nation*
Lordmills
McReynolds
*McReynold's Corners*
Millar
*Millar's Corners*
*Nation*
*Petite Nation*
Shanly
South Nation
*South Rideau*
Wilson
*Wilson's Bay*

### Grey.

Georgian

### Haldimand.

Canboro
Cook
DeCewville
McKenzie
Nelles
*Nelles Corners*
Sherbrooke
Willowgrove

### Haliburton.

Boshkung
Bright
Burnt
Canning
*Cay-ka-quah-be-kung*
Davis
Drag
East
*Eel*
Eels
Farquart
Fishtail
Fletcher
Grace
Haliburton
*Hall's*
Harry
Johnson
Kabakwa
*Kah-bah-bah-quah*
*Kah-shah-gah-wig-e-mog*
*Kah-wah-she-be-mah-gog*
*Kahwambejewagamog*
Kashagawi
Kashagawigamog
Kawagama
Kekkekwabi
*Ken-ne-big*
*Ken-ne-ses*
Kennibik
Kennisis
Kimball
Kingscote
Kushog
Little Boshkung
Louisa
Macdonald
McFadden
McKenzie

## ONTARIO—*Continued.*

### Haliburton—*Con.*

Miskwabi
*Mis-quah-be-nish*
Monk
Monmouth
Moore
*Ne-na-tik-go*
Ninatigo
North
*Numnekaming*
Nunikani
Oxtongue
Paudash
*Pee-pee-ke-wah-be-kung*
Pen
Percy
Pipikwabi
Poverty
Redstone
Rock
*Sah-wah-mish-she*
St. Nora
Sawamisshi
Sheldon
Soyers
Stormy
Straggle
Welcome

### Halton.

Bronte
Milton
*Milton West*
Oakville
*Sixteen Mile*
Snider
*Snider's Corners*
*Twelve Mile*

### Hastings.

Anne
Baker
Baptiste
Bayside
Boulter
Clark
Cochill
*Coe Hill Mines*
Copeway
Crow
Deseronto
Diamond
Dickey
Dixon
Egan
Fraser
Grimsthorpe
Gunter
Hastings
Hungry
Jamieson
*Jamieson's*
Jordan
*Katlick Manitou*
Kamaniskeg
L'Amable
Limestone
Long
*Long*
Moira
Myers
Nigger
Ox
Papineau
Quinte
Salmon
Shannonville
Sidney
Snake
Tangamong
Telegraph
Thomson
Thurlow
Trent
Trenton
Trident
Tyendinaga
Wadsworth
Whetstone
*Wolf*
York
Zwick

### Huron.

Albert
Ausable
Bayfield
Blacks
Cantin
Goderich
Kintail
Maitland
Menesatung
*Sable*
St. Joseph
Wright

### Kenora (district).

*Abraham*
Abram
Adam
Affleck
Aiabewatik
Alexandra
Amik
*Ant*
Anzhekumming
Armstrong
Ash
Asheigamo
Assinkepatakiso
Atikwa
Austin
*Bad Rice*
Bailey
Bakado
Ball
Baine
Barclay
Barnston
Barren
Barrie
Basket
*Bass*
Beaubien
Beaverhouse
Bending
Bent
Berry
*Black Bird*
*Black Sauchill*
*Blueberry*
Botsford
*Boulder*
Bowden
Boyer
Brownie
Burnet
Burntwood
Butler
Calder
Cameron
Cañon
*Canoe*
Carleton
Caron
Celtis
Centrefire
Cherry
Circle
*Clear*
*Clearwater*
Cleftrock
Cliff
Cook
Corn
*Crow*
Daniels
*Danish*
Deacon
*Deer*
Delany
Denmark
Dinorwic
Discovery
Dominick
Don
Drewry
Dryberry
Dryden
Dyment
Eagle
Eagle Rock
*Edith*
Edward
Elbow
English
Ethel
Eva
Evening
Favel
Fawcett
Fiord
Fisher
Flint
Fluke
Fog
Foreleg
Forest
Gamskagamik
Gawjewiagwa
Ghost
Gilbert
Gordon
*Grassy River (lake)*
Grindstone
Gryphon
Hall
Harris
Hawk
Hawkcliff
*Hawkrock*
Hebden
Hector
Highstone
Hill
Hodgins
Hourglass

## ONTARIO—*Continued.*

**Kenora (district)**—*Con.*

Hughes
Hutchison
Ingall
Jay
John
Kabagukski
Kabikwabik
*Kabitustigwciak*
Kagiwiosa
Kaiashkomin
Kakagi
Kakinnozhans
Kamanatogama
Kaminnassin
*Kaminnaweiskagwok*
Kaminni
Kamongus
Kaopskikamak
Kaoskauta
Kapesakosi
*Kapikwabikok*
*Kasakacheweiwak*
Kawashegamuk
*Kawasheibemagagamak*
Kawawia
*Kawawiagamak*
Keikewabik
Kekekwa
Kennabutch
Kennewapekko
Kenora
Kenozhe
Keys
Kilvert
Kimmewin
Kinnickoneship
Kinnyu
*Kinoje*
*Kiskopkechewans*
Knob
Kramer
Kukukahu
Kukukus
*Kukus*
*Large Trout*
Laurier
Lester
Lewis
Lindal
Line
Linklater
*Little Jackfish*
*Little Wabigoon*
Lobstick
*Lonely*
*Lone Man's*
*Long*
*Loon*
Lorne
Lost
Lount
Low
*Lynx*
McDonald
McHugh
McIntyre
McLennan
MacMillan
Mang
*Manitou*
Manitumeig
Manomin
Mark
Martin
Matilda
Maynard
Meander
Meggisi
Menikwesi
Mennin
Meskwatessi
Mestowana
Miller
Minnaweiskag
Minnehaha
Minnesabik
Minnikau
Minnitaki
Mongus
*Moonshine*
Morgan
*Mountain*
*Mud*
Mystery
Namego
Nemeibennuk
Nimrod
Norse
N. W. Angle
Nozheiatik
*Nurse*
Oak
Oneman
Ord
Osbourne
Osipasinni
Otakus
*Oval*
Oxdrift
*Painkiller*
Parrywood
Peak
Pelican
Penassi
*Perault*
*Pereault*
Perrault
Pichenninnis
Picture Narrows
*Pine*
Power
Priam
*Rat Portage*
Rosamond
Ross
Route
Rowan
*Saganaga*
Sasakwei
Schist
Schnarr
Seggemak
Selby
Separation
Seul
*Shallow*
Shingwak
Shongwashu
Silver
*Small Trout*
Smoothrock
Spar
Stanawan
Stanzhikimi
Stephen
Stewart
Stranger
*Sucker*
Summit
*Summit*
Sunday
Sunshine
Syndicate
Taché
Talbot
*Tasheigama*
Tawatinaw
Teggau
Threefork
Thunder
Tide
Twilight
*Unaminnikan*
Uphill
*Upper Manitou*
Vermilion
*Vulture*
Wabigoon
*Wabigwunn*
Wall-eye
Walsh
Wapageisi
*Wapoose*
Wapus
Washeibemaga
Wasp
Weiseieno
Whitney
Wickens
*Wigwas*
Wilcox
Willard
Williams
Winnange
Woods

**Kent.**

Dover East
*Dover South*
*East Dover*
Ennett
Jeannette
Mitchell
Mitchell Bay
Muirkirk
Paincourt
Rondeau
St. Clair
*Turnerville*

**Lambton.**

Blackwell
*Blind*
*Blue*
Chematogan
Edward
*Eddy's Mills*
Edy Mills
*Fawn*
Harris
Henry Corners
*Ipperwash*
Kettle
Kingscourt
Mandamin
Moore
Petrolia
Point Edward
St. Anne
St. Clair
Woodtick

## ONTARIO—*Continued.*

### Lanark.

Allan Mills
Christie Lake
Ferguson Falls
Franktown
Smiths Falls

### Leeds.

Adelaide
Admiralty
*Amazon*
Anderson
*Ash*
Aspasia
Astounder
Aubrey
Axeman
Bagot
Barge
Bass
*Bathing*
*Bathurst*
Battersby
Baumgardt
Beaurivage
Belabourer
Bellmay
*Big*
*Big Stave*
Bingham
*Black Charlie*
Bloodletter
Bloomfield
Bluff
*Bluff*
*Boss Dick*
Bouchier
*Bowes*
Bratt
Bridge
Brock
Broughton
*Brush*
*Buck's*
*Burnt*
*Burntstone*
*Bush*
Camelot
Campbell
Carnegie
*Cary*
*Catline*
Champagne
*Cherry*
Chichester
*Chimney*
*Chimney Island* (point)
*Citron*
Cleopatra
Club
Cockburn
Collier
Conran
Constance
Cook
Corn
*Corn*
*Corn Island* (shoals)
Cunliffe
*Cut*
Dark
*Dark*
Dashwood
Davis
Deathdealer
*Deer*
DeRottenburg
DeWatteville
Dinghy
Dobbs
Doctor
*Donald*
Downie
Dromedary
Dumfounder
*E. Chimney Island* (shoals)
Endymion
Everest
Fairfield
*Fairfield East*
Fiddlers Elbow
Fisher
*Float*
Forsyth
Fort Wallace
Garrett
Georgina
*Gibraltar*
Gig
Glenelbe
Gordon
*Goulbourne*
*Grape*
*Grass*
Grenadier
Griswold
*Guide*
*Gunliffe*
*Halsted*
Hambly
*Hamilton*
Harvey
*Hay*
Hickey
Hill
*Hog*
Holsted
Hooper
*Horse Block*
*Huckleberry*
*Humbly*
Ingall
Jackstraw
Jones
Killenbeck
Lake Fleet
*Leak*
*Leek*
*Leroux*
*Lindoe*
Lindsay
*Little*
Littlejohn
*Little Stave*
Lynedoch
McCoy
McDonald
*McDonald's*
McIntosh
McMahon
McNair
Melville
Mermald
Mile
*Mile*
*Millar's*
Milton
*Mink*
*Montgomery*
Mulcaster
Murray
Myers
*Narrow*
Navy
Needles Eye
Netley
Niagara
Niddery
Ninette
*O'Connor*
O'Conor
*Old Bluff*
O'Neil
Otty
Owen
Patterson
*Pear*
Peel
Perch
*Picnic*
Pilot
*Pine*
Pitchpine
Poole
Pooles Resort
Popham
Prince Alfred
*Prince Edward*
Prince Regent
Princess Charlotte
Psyche
*Quarry*
Raft
Ramsden
*Raspberry*
*Rattlesnake*
Redhorse
*Reed*
*Refugee*
Renny
Riall
Rich
Robert
Robinson
Rocksprings
Rolleston
Rose
Rough
*Round*
Rowley
Royal
St. Helena
St. Lawrence
Savage
Scorpion
Seeley
*Seven Pines*
*Shantee*
*Shanty*
Sheaffe
Sherbrooke
Sherwood Spring
Shoe
*Shoemaker*
Simcoe
Sir William
Sisters
Skelton
*Smith's*

## ONTARIO—*Continued.*

### Leeds—*Con.*

*Smoke*
*Snake*
Sparrow
Spectacles
Spilsbury
Spong
*Squaw*
Stave
Stovin
*Sugar*
*Sumac*
*Sumach*
Surveyor
Tar
*Tent*
*Tent Island* (shoal)
The Punts
Thwartway
Tidds
Troughton
Twin Sisters
Van Buren
Vansittart
Victoria
Wallace
Watch
Wedlock
Willoughby
Wiltse
Yeo
Yorke

### Lennox.

Amherst
*Fish*
Kerr
*Nicholson*
*O'Drains*
Parrott
Preston
Salmon
*Scott*
Unger
Wemps
Wright

### Lincoln.

Amherst
Bismarck
*Camden*
Campden
Gainsborough
*Grassey's Corners*
Grassie
Jordan Harbour
Queenston
St. Ann
St. Catharines
St. David
Wellandport

### Manitoulin (district).

Advance
*Aquawa*
Ainslie
Bain
Beech
Bélanger
Benson
Birch
*Black*
Blake
Blue Jay
Boom
Buckeye
Buller
Burnt
Burnt Island
*Cariboo*
Carroll Wood
Carter
Castilian
Channel
Charlton
Chisholm
Christina
Cinder
Cockburn
Dave
Dean
Desert
Dominion
Dunn
*East Belanger*
East Sister
Edna
Ella
Emily Maxwell
Everett
Fagan
False Detour
Fisher
Fitzwilliam
Frechette
Froude
Gaspesia
Gatacre
Genesta
Girouard
Glycerine
Goose
*Grand Manitoulin*
Grantham
*Grant*
Gravel
Great Duck
Green
Greene
Greene Island
*Gull*
Hammond
Hannah
Hensley
Herschell
*Hewson*
Horseshoe
*Houston*
Hughson
Hungerford
*Husten*
Hyndman
Indian
Inkster
Inner Duck
Ivan
James
Jenkins
Jennie Graham
Jones
Kipling
Kitchener
Kitty
Labrador
Larry
Leask
Little
*Little Cockburn*
*Little Grant*
*Little Green*
Lonely
Lougheed
Lucas
Lynn
Macauley
McCarthy
McGaw
McKay
McKim
McLelan
Magnetic
Maiden
Manitoba
Manitou
Manitoulin
*Manitoulin gulf*
Manitowaning
Mary
Mayflower
Meldrum
Melville
Methuen
Michael
Middle Duck
*Mildram*
*Mildrum*
Milton
Mindemoya
Mink
Misery
Mississagi
Monell
Murphy
Mutchmore
North
Outer Duck
Owen
Pearson
Perseverance
Phœbe
Portage
Providence
Pulpwood
Purvis
Quarry
Queen
Rathbun
Red Dan
Rickett
Rickley
Rixon
Roberts
Rudyard
*Sand*
Saunders
Scotchie
Seaman
Shamrock
Shecake
Ship
Simcoe
*Simms*
Sims
Smith
South
S. Baymouth
Square
Srigley

## ONTARIO—*Continued.*

### Manitoulin (dist.)—*Con.*

Stafford
Steevens
Stewart
*Stony*
Taylor
The Narrows
The Ridge
Thibault
Thistle
Thomas
Timber
Todman
Vigilant
Volunteer
Wagosh
Walker
Walkhouse
Wallace
*West Belanger*
West Duck
Western Duck
West Sister
Wheeler
White
Wild
*Woods*
*Yeo*

### Middlesex.

*Arva*
Fairfield
Glenwillow
Hutchinson
*Hutchison*
Kerwood
*London Junction*
McGillivray
McInnes
*McInness*
Maplegrove
Medway
Parkhill
Pottersburg
The Grove
Walker
*W. McGillivray*

### Muskoka (district).

Bays
Brébeuf
Georgian
*Ley*
Muldrew
Muskoka
*Rice*
St. Mary
Trading

### Nipissing (district).

Aylen
Cache
Camp
Cassels
Dotty
*Great Opeongo*
Hay
Link
Little Madawaska
*Little Opeongo*
Lobster
Lorrain
Macaulay
McNevin
Madawaska
Maggie
Net
Obashkong
Opeongo
*Peeshabo*
Pishabo
Provoking
Ragged
Rib
Sea
Smoke
Source
Sutton
*Sutton's*
*Tamagaming*
Tasso
Tea
*Temagami*
*Temiscaming*
*Temiscamingue*
*Temiskaming*
Timagami
Timiskaming
Two Rivers (lake)
*White Bear*

### Norfolk.

Fairground
Kinglake
LaSalette
Long
Long Point
Mabee
*Maybee*
*North Foreland*
*Outer Bay of Long Pt.*
Villanova

### Northumberland.

Brighton
Calf Pasture
Carrying Place
Crow
*Gale*
Hastings
Murray
Peter
Presqu'ile
Salt
Sherwood
Shoal
*Stoney*
Stony
Trent
Twelve O'Clock
Weese

### Ontario.

*Big Rouge*
Couchiching
Champlain
Chiefs
Duffin
Frenchman
*Pickering*
Rouge
*Starvation*
Strawberry

### Oxford.

Banner
Currie
*Currie's Crossing*
Folden
*Folden's Corners*
Goble
Harrington
*Harrington West*
Hawtrey
Nith river
*Smith's creek*
Tillsonburg

### Parry Sound (district).

Alwin
Bigsby
Bray
Cherry
Counts
Dead
Depot
Dokis
Frances Smith
*Franklin*
Georgian
Germain
Guano
Hanna
Keefer
Key
Lash
Maganatawan
*Maguctawan*
Mann
Murray
Perkins
Phillips
Pine
Pratt
Ruel
Shawanaga
Shebeshekong
*Supply*
Wedge
Wicksteed

### Patricia (district).

*Achigo*
Anamebini
Annimwash
Ashewelg
Attawapiskat
Badesdawa
Bamaji
*Bamajigma*
*Birch*
*Black-iron*
Blackstone
Bluffy
Cat
*Cedar*
*Chuch Kaone*
Chukuni
Cochrane
*Cross*
Eabemet
Ekwan
English
*Fagan*

## ONTARIO—*Continued.*

### Patricia (dist.)—*Con.*

*Fairy*
Favourable
Fawn
Fishbasket
*Fort Severn*
Greenshields
Gullrock
*Hair*
Hudson
Kabania
*Kah-mini-ti-gwa-quiack*
*Kakinookama*
Kanuchuan
Kapikik
Kapiskau
Kapkichi
Kasagiminnis
*Kay-gat*
*Kaypiscow*
Kee-she-kas
Keigat
Kenozhe
Kishikas
*Kishki*
*Lake of the Narrows*
*Little Cedar*
*Little Sachigo*
*Little Shallow*
*Lonely*
Long-legged
*Lower Clearwater*
Machawaian
Makokibatan
Mamakwash
Mameigwess
Manitush
Margaret
Marten Drinking
*Matawa*
Medicine-stone
Meggisi
Michikamog
Michikenis
Michikenopik
Miminiska
Mimominatik
Misamikwash
Monsomshi
Nameins
Nankikà
Nechigona
Nemeigusabins
Nibinamik
Nolin
Obashi
Ochig
Ogani
Opikeigen
Opinnagau
Oponask
Otoskwin
Ozhiski
Ozhuskans
*Packhoon*
*Pagaonga*
Pakhoan
Pakwash
Papaonga
*Paquash*
*Pe-kange-kum*
*Pekangikum*
*Pepisquew*
Pichinamei
Pickle
Pikangikum
*Pincchannel*
Pizustigwan
*Powingow*
Red
Root
Sachigo
Sagaminnis
Sesikinaga
Seul
Severn
Shabumeni
Shagamu
*Shakaneh*
*Shallow*
Shamattawa
Slate
Sogakwa
Sutton
Tabasokwia
Tashka
Totogan
*Upinnakaw*
*Vermilion*
Wadopi
Wagabkedei
*Wai-nusk*
*Wapikik*
Wapikopa
Wapitotem
Washagami
Washagomis
*Washegummy*
Washi
*Weenisk*
Weibikwei
Wenasaga
*West Winisk*
*Whitefish Spawning*
Whitestone
Wigwasikak
Wilcox
Williams
Windigo
Winisk
*Winisk*
Winiskisis
Winonitikameg
Wintawanan
Wizida
Wizidans
Woman
Wunnummin

### Peel.

Caledon East
Campbell Cross
*Campbell's Cross*
Credit Forks
Derry
*Derry West*
*East Caledon*
*Forks of Credit*
Inglewood
Stanley Mills

### Perth.

Listowel
St. Marys

### Peterborough.

Anstruther
Barrette
Bolger
Buzzard
Catchacoma
Chemung
Compass
Cox
Crow
*Eagle*
*Gull*
Jack
*Kag-ish-a-bog-a-mog*
Kasshabog
*Ketchacum*
Loucks
Mississagua
Oak
Pencil
Pilot
Serpentine
*Shemong*
Stony
Stoplog
Tallan

### Prescott.

*Atocas*
*Autaca*
Azatika
*Deseticaux*
*Dez Amecane*
Fournier
*Fournierville*
George
*Graisse*
Gratton Corners
*Great*
Hamilton
*Large*
*Little Nation*
L'Orignal
McAlpine
*Nation*
*Petite Nation*
Rigaud
South Nation

### Prince Edward.

Albury
Ameliasburg
Athol
Bald
Becroft
Big
Bigelow
*Big Sandy*
Bongard
Cadman
*Captain John's*
Carrying Place
Cedar
Charwell
Cole
Consecon
Cornwall Park
Cow
*Egg*
False Ducks
Foresters
Fox
Grape

## ONTARIO—*Continued.*

### Prince Edward—*Con.*

*Gravelly*
Green
Grove
*Gull*
Horse
Huff
Indian
*Indian*
*Little Sandy*
*McDonnel*
Massasauga
Miller
Muscote
Northport
Onderdonk
Ostrander
Owen
Pine
Pleasant
Potter,
Prince Edward
Prinyer
Quinte
Rednersville
Robinson
Rossmore
*Salmon*
*Salt*
Scotch Bonnet
Ship
Smoke
Solmes
Solmesville
Sophiasburg
*South*
*South Bay*
Stoneberg
*Stoneburgh's*
Swetman
Telegraph
Timber
Wallbridge
Way
Weller
Wellington
*West*
Wicked
Youngs

### Rainy River (district).

Basswood
Bayley
Big Knife
Birch
Bottle
Cache
Carp
Chaudière
*Chaudière*
Crooked
Curtain
Cypress
David
Fort Frances
Hunter
Iron
*Kawawlagamak*
*Kettle*
Knife
Koochleching
LaCroix
Little Knife
Little Vermilion
Long Sault
Loon
McGinnis
*McInnis*
Manitou
Melon
Merriam
Namakan
*Nameukan*
*Namoukan*
*Nequaquon*
Pooh-bah
Portage
Rainy
Saganaga
Sand
Sand Point (lake)
Seed
*Seiganagah*
*Seiganagan*
*Seiganagaw*
*Sewell*
Stanjikoming
Swamp
Swell
Thompson
*Vermilion*
Wawiag
*Whitefish*
*Whitewood*
Woods

### Renfrew.

Allumette
*Allumette*
Bark
Barron
Beardwood
Blackfish
Carson
Cartier
Chalk
Chalk River
Charlotte
Corry
*Currys*
Gorman
Greenan
Lève
McMaster
Madawaska
Paugh
*Pembroke*
Petawawa
*Petewawa*
*Rockliffe*
*South Petawawa*
Stonecliff
*Sturgeon*
Tucker
York

### Russell.

Bearbrook
Bray
*Bray's Crossing*
Carlsbad Springs
Cheney
*Cheney Station*
Cobb
*Eastman's Springs*
Embrun
*Little Nation*
Martel
*Martel Corners*
*Nation*
*Petite Nation*
St. Onge
South Nation
*The Lake*

### Simcoe.

Bond-Head
Carthew
Couchiching
Georgian
Glenhuron
Kempenfelt
McPhee
Orchard
Penetanguishene
Simcoe

### Stormont.

*Black*
*Chrysler*
Croil
Crysler
Dickinson Landing
Eamer
Harrison
*Harrison's Corners*
Hoople
*Little Nation*
Mille-Roches
Monckland
*Monklands*
*Nation*
Osnabruck
Osnabruck Centre
*Osnabruck*
*Petite Nation*
Raisin
*Raisins, Riv. aux*
St. Andrews
*Sheak*
Sheck
*Sheik's*
*Shieck*
South Nation

### Sudbury (district).

Katherine
*Wahnapitae*
*Wakamaganing*
Wakami
Wanapitei

### Thunder Bay (district).

Aldridge
Allanwater
Arrow
*Bagutchuan*
Barbara
Barnard
Barrington
Beckington
Black Sturgeon
Bonnet
Brodeur

## ONTARIO—*Continued.*

**Thunder Bay (dist.)**—Con.

*Brulé*
Bukemiga
Caldwell
Campbell
*Caribou*
*Carp*
Cat-tail
Chivelston
*Cock*
Crystal
*Crystal*
Davies
Dawson
Devizes
Edward
Elbow
Elizabeth
Emma
English
Eskwanonwatin
*Esquanonwatin*
Flatland
Fort William
Fowl
Frank
Frazer
Geikie
George
Georgia
Gourdeau
Grand
*Grand*
Granite
*Grassy*
*Great New*
Greenbush
Grey
*Gull*
Gunflint
Gzowski
Hannah
Harris
Haystack
Heathcote
*Hen*
Houghton
Humboldt
*Island Portage* (lake)
Jarvis
Jean
Jean-Pierre
Jessie
Jojo
Kabitotikwia
*Kabitotiquia*
Kagianagami
Kaiashk
Kama
Kaministikwia
Kashaweogama
*Kawakashkagama*
Kawashkagama
Kawaweogama
*Kawawiagamak*
Kelvin
Kenny
Kenogami
Keshkabuon
Kopka
Lasher
Lily
*Little Flatland*
Logan
Lomond
Long
Lookout
McEwen
McIntyre
McKay
McKellar
Mackenzie
McLaurin
Magnet
Magnetic
Makokibatan
Manitou
Maria
Marshall
Martin
Masinabik
Mattice
*Mazokama*
Michipicoten.
Middlebrun
Miminiska
Mission
Montreal
Moose
Mountain
*Mud*
*Muddy*
Murchison
Nameiben
*Nepigon*
Neston
Nipigon
Nonwatin
Nonwatinose
North
North Fowl
North Wind
Obonga
Oboshkegan
Obowanga
Ogoki
Ombabika
Onamakawash
Onaman
*Onamanisagi*
Opichuan
*Orient*
Pagwachuan
Parks
Partridge
Pashkokogan
*Pawghtchewan*
*Pawgutchewan*
*Pickitigouching*
Pigeon
Piiitawabik
*Piiitawabekong*
Pikitigushi
Pine
Pishidgi
*Pittiwabikong*
Porphyry
Port Arthur
*Powaulchuan*
Rabbit
Randolph
Rat
*Reef*
Robinson
Rose
*Rove*
St. John
Saganaga
*Sapasook*
*Sapassoose*
Sapasuk
Savant
*Seiganagah*
*Seiganagan.*
*Seiganagaw*
Selwyn
Seseganaga
Shaganash
Shakespeare
Shangoina
*Sharp Mt.* (lake)
*Sheepshank*
*Sheesheeb*
Shesheeb
Silver
Smoothrock
South
South Fowl
Superior
Surprise
Swede
Tempest
Threemount
*Tiernan*
Triangle
*Turtle*
Wabakimi
Wabinosh
Wanogu
Watap
Waweig
Wawiag
Wawong
*Wendigokan*
Whiteclay
*White's*
Whitesand
Wigwasan
Windigo
Windigokan

**Timiskaming (district).**

Abitibi
*Asipimocasi*
Barber
*Bass*
*Bear*
Beaverhouse
Benson
Blanche
Cassidy
*Clear*
Cobalt
Crosby
Crown
Dawson
Farr
Friday
Gem
Gillies
Giroux
Goodwin
Gowganda
Grace
Haileybury
Hannah
*Hannah Bay* (river)
Harricanaw
*Isabemagussi*

## ONTARIO—*Concluded.*

**Timiskaming (dist.)**—Con.

*Johnny*
Johnson
Labyrinth
Larder
Latchford
Liskeard
Magusi
Mallon
Martineau
*Matabechawan*
Matabitchuan
Mattagami
Montague
Montreal
*Mud*
*New Liskeard*
Nicol
Okikodosik
Peterson
*Present*
*President*
Prud'homme
Raven
Rib
Rousselet
St. Anthony
Sasaginaga
Sharp
*S. Br. Moose R.*
*Temiscaming*
*Temiscamingue*
*Temiskaming*
Timiskaming
Wabi
Ward
Wright

**Victoria.**

Burnt
*Montgomery*
Young

**Waterloo.**

Galt
German Mills
*Mill*
Nith river
*Smith's creek*

**Welland.**

Chantler
Chippawa
*Chippewa*
Gasline
Welland

**Wellington.**

Galt
Glenallan
*Mill*
Puslinch
*Schaw*

**Wentworth.**

Binbrook
Blackheath
Clappison
Flamboro Centre
Flamboro East
Flamboro West
Galt
Harper Corners
*Mill*
Ryckman
*Stony*
Stoney
*W. Flamboro*
*W. Flamborough*

**York.**

*Big Rouge*
*Clairville*
Don
*Don*
Eglinton
*Elder*
Elder Mills
*Elder's Mills*
Fox
Hagerman
*Hagerman's Corners*
Humber
Laskay
*Laskey*
Little Don
*Middletons*
Milliken
O'Sullivan
*O'Sullivans Corners*
Reesor
Rouge
*Snake*
Springhill
Stouffville
*W. Brch. Don R.*
Wilcocks
*Willcocks*

## PRINCE EDWARD ISLAND.

**Kings.**

*East Souris*
*Hd. of St. Peter's Bay*
Montague
*Montague Bridge*
*Naufrage*
Peters Road
Refuge
St. Peter
Shipwreck
Souris

**Queens.**

*Grand Rustico*
*New Wiltshire*
North Rustico
*North Wiltshire*
St. Peter
Wiltshire

**Prince.**

*Big (or N.) Miminigash*
Cascumpeque
*Holland*
*Little Miminigash*
Malpeque
Miminegash
*Minimegash*
Princetown
*Richmond*
Roseville
Skinner Pond
*South Miminigash*

## QUEBEC.

**Abitibi (territory).**

Allard
Asinitchibastat
Assinika
Baxter
Bell
Broadback
Buck-hill
*Cabane*
Chebistuanonekau
Chensagi
Chibougamau
Coban
Cold
Cone
Dome
*Eatchepashi*
Elizabeth
Etchipotchi
Evans
Florence
Gelkie
Gizzard
*Hannah Bay* (river)
Harricanaw
Height of land
Hugh
Ice
Iserhoff
Kamshigama
*Kamiapiskau*
Kelvin
Kenlapiskau
Kenouiska
Klask
Kirk
Kitchiganna
Lady Beatrix
*Little Nottaway*
Long
Maikasagi
Mattagami
*Mattagami*
*Michadama*

## QUEBEC—*Continued.*

### Abitibi (territory).—*Con.*

Middleton
*Middle Gull* (lake)
Mikwasach
Mishagomish
Mistawak
Natchipotchi
Nipukatasi
*Noddawai*
*Nodway*
Nottaway
Obatawagush
Obatogamau
Olga
*Opamiska*
Opatawaga
Opawika
Opemiska
*Opiwatakan*
O'Sullivan
Otchisk
Pijuwyan
Puskitamika
Rabbit
*Rapid*
Reid
Scott
Soskumika
Southwest
Surprise
Taibi
*Tshensagi*
*Upper Gull* (lake)
*Victoria*
Waswanipi
Wawagosik
Wedding
Wemistagosew
West
Wetetnagami
*Wikwasash*

### Argenteuil.

Beechridge
Dalesville
Greece Point
Hillhead
Kingham
*Kingsey*
*Mid. Br. West* (river)
St. Andrews
Ste. Perpétue

### Ashuanipi (territory).

Atikonak
*Attikonak*
*Bowdoin*
*Groswater*
Kenemich
McLean
Melville
Rigolet
St. John

### Bagot.

Actonvale
Clairvaux-de-Bagot
St. Dominique-de-Bagot
St. Hector
*St. Hector de Bagot*
Ste. Hélène-de-Bagot
St. Simon-de-Yamaska
St. Theodore-d'Acton

### Beauharnois.

Buisson
Cartier
*Cartierville*
DeSalaberry
*Grand*
St. Etienne-de-Beauharnois
St. Stanislas-de-Kostka

### Bellechasse.

Abenakis
*Abenaquis*

### Berthier.

*Askwahani*
Eskwahani
Kapitachuan
*Kapitajewin*
*Kapitashewinna*
*Mashamengoose*
Matashi
*Matawa*
*Matawin*
Mattawin
*Mejomanguse*
*Menjobaguse*
Mitchinamekus

### Bonaventure.

*Baie des Chaleur*
Caplan
Chaleur
Cross
*Crosspoint*
East
*Goacha*
*Maguacha*
*Maguasha*
Matapedia
*Metapedia*
*Migoacha*
*Miguasha*
New Richmond
Pointe-à-la-Garde
Port Daniel
*Port Daniel East*
*Restigouche*
*Richmond*
Ristigouche
St. André-de-Ristigouche
St. Charles-de-Caplan
*St. George Port Daniel*
West
*West Port Daniel*

### Brome.

Call Mill
Glensutton

### Chambly.

Chambly
St. Lambert

### Champlain.

*Antikamisk*
Assiwanan
*Atem*
Atim
*Caousacouta*
*Caousagouta*
Chakwa
*Chisaouataisi*
Citrouille
Great Beaver
Hair Cutting
Kamitsgamak
*Kapitoukamick*
Kapitswe
Kausakuta
*Kawachikamick*
*Kawashekamick*
Kekeo
*Kickendatch*
Kikendatch
*Kirkendatch*
Mâle
Manuan
*Mashamengoose*
*Matawa*
*Matawin*
Mattawin
*Mejomanguşe*
Mekinac
*Menjobaguse*
Mitchinamekus
Mondonak
Najan
Normand
Obiduan
Onkammis
Oskelaneo
Pabelognang
Pasiminikana
Pitopiko
Proud-sitting
Ribbon
*Ruban*
*Sackawatisi*
St. Maurice
Salone
Sandy-beach
Sassawatisi
Sincennes
Travers
*Wakaumekouke*
Wayagamak
Weymontachi
White Bear

### Charlevoix.

Baie-St.-Paul
Brandypot
Cap-à-l'Aigle
Comporté
Corneille
Coudres
Eagle
Goose
*Jareux*
Jean-Noël

## QUEBEC—*Continued.*

### Charlevoix—*Con.*

Jureux
LeHeu
Malbaie
Mailloux
Murray
Murray Bay
Noire
Oies
Persil
Pikauba
Pointe-au-Pic
Port-au-Persil
Port-au-Saumon
*Port-à-l'eau-de-vie*
Rochers
Sain
St. Etienne
St. Fidèle
St. Irénée
*St. Paul's Bay*
St. Siméon
Salmon
Saumon
*Upikauba*

### Chateauguay.

Allan Corners
Fèves
Rivière-des-Fèves
St. Urbain-de-Chateauguay

### Chicoutimi.

Askitichi
*Baie des Ha Ha*
*Bay Ha Ha*
Foamfall
Hache
Ha Ha
Jonquière
Kapikltegoitch
Kenogami
Metabetchouan
Nikabau
Pipmakan
*Pitmakan*

### Compton.

Ste. Edwidge
St. Francis
St. François
Sawyerville

### Dorchester.

Bras
*Coulombe*
Fourchette
*Brise-culotte*

### Drummond.

St. Francis
St. François
Wickham
*Wickham West*

### Frontenac.

Adstock
Aylmer
Coldstream
Courcelles
Price
St. Francis
St. François
Springhill

### Gaspe.

Anse-à-Beaufils
Anse-au-Vallon
Beaufils (anse à)
*Bonfils*
Brion
*Bryon*
*Byron*
Cap-chat
*Cap-de-Chate*
*Cap Chatte*
*Chlorydorme*
*Cloridon*
Cloridorme
*Cross*
*Despair*
Espoir
Gaspe
Gaspé
Grande Anse
Griffon
*L'Anse au Beaufils*
*L'Anse-à-Valleau*
*Macquereau*
Maquereau
*Martin*
Martre
Rivière-à-la-Martre
Ste. Anne-des-Monts

### Huntingdon.

Anderson Corners
*Calvin Grove*
Carr
*Carr's Crossing*
Clyde Corners
Coffey
*Coffey's Corners*
Cowan
Hinchinbrook
Kelvingrove
Maybank
O'Neil
*O'Neil's Corners*
Port Lewis
*Port Louis*
Ste. Agnès-de-Dundee
St. Regis
Starnesboro
Whites

### Iberville.

Mount Johnson
St. Alexandre
Ste. Brigide
*St. Grégoire*

### Jacques-Cartier.

Allan
*Back*
Bizard
Caron
*Dowker*
Ile-Bizard
*Isle Bizard*
Lynch
*Macdougall's*
Marion
*Marion*
Orme
Prairies
Ste. Anne-de-Bellevue
*Ste. Anne du bout de L'Ile*
St. Geneviève
St. Laurent
*St. Laurent, Montreal*
*Tortue*
Valois
*Valoisville*

### Joliette.

*Askwahani*
Bull
*Blanche*
*Boule*
Eskwahani
Kapemitchigama
Kapitachuan
*Kapitajewin*
*Kapitashewiana*
*Matawa*
*Matawin*
Mattawin
Tunagamik

### Kamouraska.

Caps
Diable
Dumais
Ferme
Fouquette
Goudron
Julien
Kamouraska
Moreau
Orignaux
Pèlerins
Pilgrim
Pohenagamuk
St. André
St. Denis
St. Eleuthère
St. Germain

### Labelle

Arcand
Arcans
Arosen
Bœuf
*Cardinal's*
*Chevebots*
*Coursiardoux*
*Grand Lac du Cœur-Alsace*
Kiamika
Kiwago

## QUEBEC—*Continued.*

### Labelle—*Con.*

*La Macaza*
L'Annonciation
Macaza
Montebello
Mont-Laurier
Montpellier
*Nation*
Nomining
*North Nation*
Notre-Dame-de-Pontmain
Papineau
Petite-Nation
*Rousseau*
*Roussin*
Ste. Rosalie
St. Sixte
*Salmon*
*Sincique*
Sugarbush
Thirty-one-mile

### Lake St. John.

Alex
Ashuapmuchuan
Commissioners
File-axe
Mistassibi
*Muskosibi*
*Ouasiemska*
Pemonka
Peribonka
Pipe
*Plamorganne*
*Pmonka*
St. Louis-de-Chambord
St. Maurice
*Ticouabi*
*Tikonabi*
Tikuape
Washimeska
*Wassicuska*

### Laval.

*Back*
Bélanger
Côte-des-Neiges-Ouest
Longue-Pointe
Nuns
Prairies
Rivière-des-Prairies
St. Helen
Ste. Hélène
*St. Paul*
Sœurs (île des)
Tétreauville
*Village Bélanger*

### Lévis.

*Aulnes*
Auneuse
Baillargeon
Bras
*Brise-culotte*
*Coulombe*
Cugnet
*Cuignet*
Fourchette
*Gaspé*
*Grillage*
*Neux*
*Noeds*
Pintendre
*Quenotte*
*St. Etienne*
St. Henri
*St. Henri Station*
*Vicontent*
*Vitcontent*

### L'Islet.

Algernon
*Roche à Veillons*
St. Pamphile
St. Roch-des-Aulnaies
*South*

### Lotbinière.

Deschaillons
*Eschaillons*
*Langlais*
Langlois
Pointe-Platon
St. Antoine-de-Tilly
*St. Antoine, Lotbinière*
*Ste. Emelie*
*Ste. Emilie*
Ste. Emmélie
*St. Jean Deschaillons*

### Maskinonge.

Kapitachuan
*Kapitajewin*
*Kapitashewinna*
*Mashamengoose*
*Matawa*
*Matawin*
Mattawin
*Mejomanguse*
*Menjobaguse*
Mitchinamekus
*Nemicachingue*
Nemikachi

### Matane.

Causapscal
*Cosupscoult*
*Great Metis*
Matapedia
*Metapedia*
Metis
*Mitis*
Ste. Angèle-de-Rimouski
St. Edmond
Ste. Florence
Sayabec
*Taouagadec*
Tawagadik
*Towagodi*
Val-Brillant

### Megantic.

Bécancour
Black
Black Lake
Clapham
Coldstream
Coleraine
*Colraine*
Ireland
*Lake Megantic*
Megantic
Pontbriand
Robertson
*Robertson Station*
Sacré-Cœur-de-Marie
St. Antoine-de-Pontbriand
Thetford

### Missisquoi.

Abbott Corners
Farnam Corners
Meig
*Meig's Corners*
Nutt
*Nutt's Corners*

### Mistassini (territory).

Abatagush
Albanel
*Cabistachuan*
Chabatok
Cooper
Kabistachuan
Kanotaikau
Kokomenhani
*Little Mistassini*
Marten
Miskittenau
Mistassini
*Mistassinis*
Mokwawastuk
*Namiska*
Nemiskau
Pinched-neck
Pontax
*Pontiac*
Poplar
Punichuan
Robert
Rupert
*Tesaycau*
Tesekau
*Wahwanichi*
*Wakinichi*
Wakonichi
Wettigo

### Montcalm.

Akos
Bear-grease
Bouchette
Kakashe
Kamachigama
Kapitachuan
*Kapitajewin*
*Kapitashewinna.*
Namegos
Namegosis
*Nemegos*
*Nemegosis*
Nipmenanni
O'Sullivan
*Shesheinquann*
Shoshokwan
Tapani

## QUEBEC—*Continued.*

### Montmagny.

Frontier
Frontière
Lacaille
St. Paul-du-Buton

### Montmorency.

Cap Brûlé
*Grand Lake Jacques Cartier*
Jacques-Cartier
Metaskuak
Montée du Lac
*Montée du Lac*
Nakwagami
*Naquagami*
Upika
*Upsika*

### New Quebec (territory).

(*Ungava.*)

Abloviak
*Akpatok*
Akwatuk
Alukpaluk
*Aquatuk*
Aukpatuk
*Beacon*
Bennett
*Big*
*Big Rock*
*Bishop Roggan*
*Bowdoin*
Burgoyne
Burwell
Cairn
*Cape of Hopes Advance*
Chidley
Chimo
*Chudleigh*
Comb
Deception
Diana
Douglas
Dyke
Eastmain
Fisher
*Fort Chimo*
*Foster's*
George
Gray
*Great Bishop Roggan*
High Fall
Hopes Advance
Hudson
Inukshilgaluk
Inukshuktuyuk
Ittimenotok
Joy
Junnusuksoak
*Kangerthialuksoak*
Kaniapiskau
Kattaktok
Keglo
*Kenogamissee*
Kernertut
King George
Koksoak
Kyak
Labrador (reef)
Larch
Leaf
McLean
*McLean*
McLelan
Manitounuk
Nedluk
*Nepihjee*
Neptune Head
*North*
Old Factory
*Opinaca*
Opinaka
Payne
*Petatstekupau*
*Petishikupau*
Petitsikapau
*Petshikupau*
*Prince Henry Foreland*
Richmond
Roggan
*Seal*
*Shedlui*
*South*
Stimukoktok
*Straight*
Stupart
*Tasurak*
The Wart
Tisiriuk
Tunnussaksuk
Tuttle
Tuvalik
*Uibvaksoak*
Uinaksoak
Wakeham
*Wauguash*
Weggs
Whale
Whitley
Wiachuan
William Smith

### Nicolet.

Godfroy
Manseau
*Moran*
Moras
Ste. Cécile-de-levrard
*St. Pierre des Becquets*
St. Pierre-les-Becquets
*St. Pierre les Bequets*

### Ottawa.

Aylmer
*Aylmer East*
Baskatong
Deschênes
*Deschênes Mills*
*Gatineau Point*
Gens-de-terre
*Grand Lac du Commissaire*
*Jean de Terre*
Kazabazua
Kirk Ferry
Lapêche
*McLaren*
McLaurin
*Mushonga*
Ottawa
Pemichangan
*Penichangan*
Pointe-Gatineau
Remic
*Remous*
Thirty-one-mile
Wabassi
Wilson Corners

### Pontiac.

Anwatan
*Armstrong*
Atik
*Atikosipi*
Barrière
*Birch*
Burnt Bay
Chartier
Downey
Dozois
Garden Island (lake)
Gens-de-terre
*Jean de Terre*
Kabona
*Kahuch*
Kakabonga
*Kakebonka*
Kampigukakatoka
Kanikawinika
Kanimitti
Kanusio
Kapitachuan
*Kapitajewin*
*Kapitashewinna*
Katonche
Kazabazua
Kekek
Lapêche
Mackey
*Macoostigan*
Makustigan
Matchimanito
*Megiskun*
*Mekiscan*
*Metchiskan*
*Metiscan*
Migiskan
Millie
Nipmenanni
Northeast
*Opequanne*
*Opequon*
Opikwan
Paskagama
Quio
*Quio*
Quyon
Rapides
Sassaganaga
Shabogama
Shamus
*Sheshelnquann*
Shoshokwan
Sifton
*Thomasine*
Tomasine
*Wajabakante*
Washeka
*Waskeau*
Wetetnagami
Whitegoose
Wotinimata

## QUEBEC—*Continued.*

### Portneuf.

Dombourg
*Donbour*
*Fréchette*
Lac-Sergent
Pierre
Rivière-à-Pierre
St. Casimir
St. Marc-des-Carrières
Sergent
St. Basile-de-Portneuf

### Quebec.

Barrès
Biart
Briand
Epaule
*Kajoualwang*
*Kakisksagamak*
*Kamamintigongue*
*Kamilikamac*
Lescarbot
*Little Metascouac*
*Najualand*
Najwalwank
Nakwagami
*Naquagami*
Notre-Dame-des-Laurentides
Ste. Foy
Ventadour
*Wamilkaszibic*

### Richmond.

St. Francis
St. François

### Rimouski.

*Arignole*
*Mistigouche*
*Mistigougèche*
Mistikus
Orignal

### Rouville.

*Ange Gardien de Rouville*
Barbue
*Barbue de St. Césaire*
*Belœil*
Canrobert
Huron
*L'Ange Gardien*
Marieville
Papineau d'Abbotsford
Richelieu
*Rouville*
St. Hilaire
St. Michel-de-Rougemont
*Village Richelieu*

### Saguenay.

Alouettes
*Bason*
Bergeronnes
Bersimis
*Betsiamits*
Bouleau
*Chaloupe*
*Choniaban*
Eau Dorée
*Englishman's*
Escoumains
Eskimo
*Esquimaux*
*Fall*
Godbout
*Goodbout*
Harrington
*Ichimanicuagan*
*Ile aux Morts*
Ishimanikuagan
Jupiter
*Jupiter*
Lark
*Lark*
La Tabatière
Leman
*Les Bergeronnes*
Lionnet
*Little Mecattina*
*Little Natashquan*
*Manicouagan*
*Manicuagan*
Manikuagan
Marguerite
Martimoki
*Mecatina*
Mekattina
Mille-Vaches
Moisie
Monts
*Mooshaulagan*
*Mouchalagan*
Mushalagan
Muskwaro
*Nabesipi*
*Nabesippi*
Nabisipi
Napetipi
Natashkwan
*Natashquan*
*Observation*
Olomanoshibo
Pashashibu
*Peashteebee*
Pentecôte
*Pepechekau*
Piashtl
*Piastre*
Pikapao
*Pikopao*
Pipishikau
*Point Aux Alouette*
Pointe-des-Monts
Quetachu
Romaine
St. Augustin
*St. Augustine*
Ste. Marguerite
*Ste. Marguerite*
Sault-au-Cochon
*Saut de Cochon*
*Saut de Mouton*
*Sawbill*
Sept-Iles
Seven Islands
Shallop
*Shecatica*
Shekatika
Sheldrake
Sholiaban
*Souriban*
*Sourilaban*
Southwest
Tadoussac
*Takameshau*
Tête-à-la-Baleine
*Todnustook*
*Toolnustook*
Tortue
Tulnustuk
Wapustagamu
Washikuti
*Washsheecootai*
*Watcheeshoo*
*Watsheeshoo*
Watshishu

### St. Hyacinthe.

St. Barnabé-R.-Yamaska
St. Joseph-de-St. Hyacinthe

### St. Johns.

Belle-Vallée
*Fort Lennox*
Ile-aux-Noix
Meule
Noix
*North of Halfway*
St. Bernard-Sud
St. Valentin

### St. Maurice.

Aigles
*Clair*
*Camamableacossa*
*Cawaskikamick*
DeVenyns
*Eagle*
Glaises
Goldfinch
Goulet
Kawaskisigat
*Kawasgisguegat*
Kempt
*Loutres*
*Mashamengoose*
Maskeig
*Matawa*
*Matawin*
Mattawin
*Mejomanguse*
*Menjobaguse*
Mitchinamekus
Pakonsigane
Pieromonta
St. Maurice
*Shawenegan*
Shawinigan
Shawinigan Falls
*Wabaskoutyunk*
*Wagwabeya*
Wagwablka

## QUEBEC—*Continued.*

### Shefford.

Grandboro
Milton
*Milton East*
Rochelle
Roxton East
St. Alphonse-de-Granby
*Ste. Anne-de-Stukely*
Ste. Cécile-de-Milton
St. Joachim-de-Shefford
Savage

### Sherbrooke.

Ascot
*Little Magog*
Magog
St. Francis
St. François
Sherbrooke

### Soulanges.

Baudet
*Beaudet*
*Bôdet*
*Bouleau*
Cedars
*Chateauguay*
*Dadancourt*
*Dalhousie Mills*
Dalhousie Station
*D'Alogmy*
DeBeaujeu
Giroux
*Grande Batture*
*Grande Ile aux Erables*
Joubert
Lalonde
Leonard
Maple
*Petite Ile aux Cygnes*
*River Beaudette*
*Round*
Sévigny
*Soulanges*
*Thorn*

### Stanstead.

*Baldwin's pond*
*Barnston pond*
*Little Magog*
Magog
Lyster

### Temiscouata.

Barrett
Cabano
Cacouna
Demers
Fraserville
*Frazerville*
Hare
Lièvres
Loup
Marmen
Notre-Dame-du-Portage
Rivière-du-Loup
Roche-Percée

### Terrebonne.

Achigan
*L'Achigan*
Rouge
Ste. Agathe-des-Monts
Ste. Thérèse-de-Blainville

### Timiskaming.

*Abbika*
Abitibi
*Agotawekami*
*Amikitik*
Amos
Apika
*Asapikona*
*Asipimocasi*
*Askikwaj*
*Atikamek*
*Atikmahik*
*Bagwah*
*Bass*
*Bear*
Beauchamp
Beaudry
Bell
Bellefeuille
*Big*
*Big Obashing*
Blouin
*Brownwater*
Brushy
Carcajou
Caron
Chief
Chikobi
Christopherson
Clay
Coffee
Crémazie
*Crooked*
Darlens
Dasserat
Davy
De Montigny
Dufault
Dufay
Dufresnoy
Dumoine
Duparquet
Eagle
Eel
*Eel*
Evain
Expanse
Faucher
Figuery
*Fish*
Fisher
Fréchette
Gaboury
Gaotanaga
*Grand*
Grand lake Victoria
*Hannah Bay* (river)
Harricanaw
Hébécourt
Hébert
*High Water*
*Isabemagussi*
*Island*
Islands
Jacob
*Kaishk*
*Kajakanikamak*
*Kakameonan*
*Kakinokamak*
*Kamoukakwiti*
Kanasuta
Kapitagama
Kawasachuan
Kawastaguta
*Keec*
*Kee-ec-kee-ec*
*Keepewa*
Kekeko
Kewagama
*Kewagodoongojioon*
Kiekkiek
Kiemawisk
*Kienawisik*
Kinojevis
Kipawa
Kokomis
Laberge
Labyrinth
*Lake of Islands*
La Motte
Lamy
LaPause
*Lartigue*
La Sarre
Lemoine
Lily
*Little Roger*
*Lizard*
Lois
Lonely
*Long*
*Lorenzo*
Lorrainville
Maganasibi
Magusi
Makamik
Mance
Mann
*Matamik*
*Mattawagosik*
*Mekamio*
*Merrill*
Mishomis
*Molesworth*
Montague
Mooschorn
Mourier
*Mud*
Namawash
*Nawapitechin*
Newagama
*Obadowagashing*
Obalski
Obashing
Obaska
Obikoba
*Obiska*
Octave
Okikodosik
Opasatika
Osisko
Otanabi
*Pakitanika*
Pelletier
Pichè
Pontleroy
Quinze

## QUEBEC—*Concluded.*

### Timiskaming—Con.

*Rest*
Robertson
Roger
*Rogers*
Routhier
Rouyn
*Rush*
St. Eugène-de-Guigues
*Seals Home*
Shabogama
*Shi-shi-shi*
Simon
Sleepy
*Spirit*
*Stewart*
*Sturgeon*
*Temiscaming*
*Temiscamingue*
*Temiskaming*
Tiger
Timiskaming
Vaudray
Villemontel
Wabanoni
Wabaskus
*Wabinoni*
Wapusanan
*Whitefish*
*Wikwaskapauk*
Winawiash

### Two Mountains.

Chicot
LaChapelle
*Petit Chicot*
St. Columban
Ste. Monique
*Ste. Monique des Deux Montagues.*

### Vaudreuil.

*Bruey's*
Brussy
*Dorion*
*Graisse*
*Green Valley*
Ile-Perrot
Point Fortune
Raquette
Rigaud
Vaudreuil
Verte-Vallée

### Wolfe.

Aylmer
Bisby
Belmina
Breeches
*Colombe*
Coulombe
Garthby
*Garthby Station*
St. Francis
St. François
Stratford
Ward
Wolfestown

### Yamaska.

St. Francis
St. François

## SASKATCHEWAN.

Acheninni
Aiktow
Alcott
Anerley
Antler
Arcola
Arm
Armit
*Armitt*
Aroma
Ashe
Attitti
Ballantyne
*Barrel*
Basin
*Basquia*
Battle
Battleford
*Bear*
*Bear Lake* (river)
Beaver
*Beaver*
Bergheim
*Big Cutarm*
*Big Quill*
*Big Sturgeon*
Birchbark
Björk
*Blackfeet*
Blaine
Bonald
Bowtree
Brightstand
Bronson
Buffalo Pound
Buffer
Bulls Forehead
Cabri
Cactus
Calder
Candle
*Caribou*
Carrot
Chapleau
Chaplin
Chitek
Churchill
Clearwater
*Clear Water*
Cold
Cole
Copeau
Cosine
Coteau
Cottonwood
Cowan
Crayfish
Crean
Crooked
*Crooked*
*Cross*
Cumberland
Cutarm
Cutknife
Cypress
Deschambault
*Dirtywater*
Doctor
Duck
*Duck*
Duck Lake
Eagle
*Eagle*
Eaglehill
Ear
*Ecapo*
Echo
Elns
Ekapo
Englishman
*Etoimami*
*Etoimami South*
Etomami
Eyebrow
Eyehill
Farrier
Fife
File
Fir
*Fish*
Fishing
Foam
Forks
Frenchman
Frobisher
Gainsborough
Gap
Garden
Garson
*Goose*
Goosehunting
Gordon
Graham
Grassberry
*Grassy*
*Great Bear Sand* (hills)
*Hanging Hide*
*Heron*
*Highpound*
Highview
Hillfarm
Horsehead
Houghton
*Houghton*
Humboldt
*Indian Pear*
Iroquois
Iskwatikan
*Island*
Jackson
Jansen
Johnston
Jumping
Jumping Deer
Kakinagimak
*Kakinokumak*
Kamatsi
Kaposvar
Katepwe
Keg
Killsquaw
Kiylu

## SASKATCHEWAN—*Concluded.*

Kutawagan
Kyaska
*La Colle*
Ladder
*La Loche*
Lavallée
Lawrence
LaRonge
Leather
Lebret
Lenore
Lilian
*Little Candle*
*Little Cutarm*
*Little Fishing*
*Little Island* (lake)
*Little Pelican*
*Little Quill*
*Little Red*
*Lobster*
Lodge
Long
*Long*
*Loon*
Lowes
McFarlane
Macleod
McMurray
Madge
Makwa
Manawan
Manito
Many Island (lake)
Maple
*Maple*
Maskwa
Meadow
*Medicine Lodge*
Meeting
Melfort
*Merion*
Methye
Midnight
*Mineronte*
Ministikwan
Mirond
*Missinnippi*
Montague
Montreal
Moose
*Moose*
Moosejaw
Morin
Mudie
Mudjatik
Mukoman
Murray
Muskiki
Muskwesi
Namew
Neale
Negik
Nemei
Nemeiben
*North Antler*
Notukeu
Nut
*Old Wives*
Okemasis
Opachuanau
Opuntia
*Pachewanow*
Paddling
Pagato
Paquin
Pasquia
Patience
*Payoonan*
*Pebble*
Peck
*Pelican*
Peonan
*Pheasant*
Piapot
*Pine Island* (lake)
Pink
Pinto
Pita
Ponass
Porcupine
Potato
Presbyterian
Primeau
Primrose
Qu'Appelle
Quill
*Rapid* (river)
*Rapid River* (lake)
*Rat*
Redberry
*Red Deer*
*Red Deer* (lakes)
Reindeer
Rivers
Roche Percée
*Root*
Round
Scentgrass
Seagram
*Seepanock*
Shaver
Shell
Shellbrook
*Silver*
Sipanok
Sisipuk
Souris
*South Antler*
Spruce
Stockwell
*Stone*
*Stony*
*Sturgeon*
Sturgeon-weir
*Sucker*
Suggi
Taggart
The Coteau
Thickwood
Thunder
Torch
Touchwood
Trade
Tramping
*Trout*
*Upper Fishing*
Valleyview
*Vermilion*
Voisin
Wakaw
Wapawekka
*Wapoos*
Wapus
Wasawakasik
*Waseana*
Waskana
Waskesiu
Weed
Whitebear
*Whitefish*
Whitefox
*White Mud*
Whitesand
Whiteshore
Whitewood
Willowbunch
Wintego
Witchekan
Wiwa
Wood
*Wood Mt.* (river)
Woody
Wrench

## YUKON.

Adams
Aishihik
Alki
Allgold
Alligator
Alma
Alsek
Ammerman
Anderson
Annie
Anticline
Arkansas
*Arkell*
Atlin
Australia
Bach
Baker
Bald
Bear
Beaton
Beaver
Becker
Bedrock
Bell
Benson
Bern
Berney
Big Salmon
Bird
Bisel
Blackfox
Blanchard
Bonanza
Boswell
Boulder
Boundary
*Boundary*
Braeburn
Brantnober
Brewer
British
Browns
Bryant
Bunker
Burnham

## YUKON—*Continued.*

Burns
Burton
Bush
Calder
Calf
Campbell
Canalaska
Canyon
Carbon
Carcross
Caribou
*Caribou*
*Caribou Crossing*
Carmack
Cassiar
Cathedral
Cave
Chandindu
*Charley*
Chieftain
Christie
Clear
Clinton
*Clondyke*
Coal
Cone
Conrad
Cooper
Corwin
Crater
Crooked
Cudahy
Dail
Dalton
Daoust
Davidson
Davis
Dawson
*Dawson City*
Deadwood
Dewdney
Dezadeash
Dickson
Dion
Division
Dognose
Dollis
Dome
Dominion
Donjek
Dundalk
Eagle
Eagle Nest
Earn
Edith
Eldorado
Emil
Ensley
Ethel
Ettrain
Eureka
Fairfield
Fay
Fenwick
Field
Finger
Finlayson
Five-finger
Flat
Florence
Follé
*Fort Selkirk*
Fortymile
Frances
Frederick
Fresno
Friday
Galena
Garnet
Gilliam
Glacier
Gladman
Glenlyon
Gnat
Gold
Goldbottom
Golden
Golden Horn
Gold-run
Granger
Granite
Gray
Green
Grizzly
Gull
Gustavus
Haeckel
Haggart
Haldane
Hall
Hancock
Harper
Harris
Hart
Healy
Henderson
Hendon
Henrietta
Hess
Hester
Hinton
Hodnett
Hoole
*Hootalinqua*
Hopkins
Horton
Hunker
Hutshi
Hutshiku
Illes
Independence
Indian
Ingram
Itsi
Janet
Jensen
Jim
Joel
John
Johnston
Joy
Jubilee
Jungle
Kalzas
Kandik
Kaskawulsh
Katrina
Keele
Ketza
*Kitza*
Klatsa
Klokhok
Klondike
Klotassin
Klotz
Kluane
Kluhini
Klukshu
Klusha
Koidern
Kusawa
*Kusiwah*
*Kwichpak*
Laberge
Ladue
Lake
Lansdowne
Lansing
Lapie
Last-chance
Laura
Laurier
*Lebarge*
Leotta
Lewes
Lewis
*Lewis*
Liard
Little Atlin
Little Blanche
Little-gem
Little Salmon
Logan
Lombard
Lorne
Lubbock
Lucky
McCann
M'Clintock
McConnell
McEvoy
Macmillan
McNeil
McPherson
McQuesten
Malcolm
Maloney
Marsh
Mary
Matheson
Maunoir
Mayo
Meadow
Mendenhall
Michaud
Michie
Miles
Miller
Milton
Miners
Minnie Bell
Mint
Mistake
Monson
Montana
Moose
Moosehide
Morley
Morrison
Mosquito
*Mountain*
Nahoni
Narchilla
Nares
Nation
Needle
Nello
Nevin
New Zealand
Nipple
Nisling
Nisutlin

## YUKON—*Concluded.*

Nogold
Nordenskiöld
*North*
O'Brien
*O'Connor*
Ogilvie
Oldman
Oldwoman
Ophir
Orange
Orchay
Ortell
Osgoode
Ottawa
Parker
Partridge
Pelly
Perkins
*Perther's*
Perthes
Peterson
Pitts
Poker
Porcupine
Porter
Povoas
Prejevalsky
Prevost
Ptarmigan
Pugh
Pyramid
Quartz
Quebec
Quiet
Quinn
Rowlinson
Reid
Reindeer
Remington
Richthofen
Riddell
Rink
*River* (mtn.)
Rob Roy
Rogue
Rose
Rosebud
Ross
Ruby
Saint-Cyr
St. Hilary
Satasha
*Sayia*
Sayyea
Schnabel
Schwatka
Scroggie
Sekulmun
Selkirk
Selous
Selwyn
Semenof
Shakwak
Sheep
Sheldon
Sifton
Simmons
Simpson
Simpson Tower
Sixty
Sixtymile
Slate
Slipper
Small Duck
Soda
Stake
Star
Starr
Stevens
Stewart
Stony
Stutzer
Sulphur
Sunday
Surprise
Swede
Tagish
*Tahte*
Takhini
Taku
Taltmain
Tantalus
Tasin
Tatchun
Tatonduk
Tatshenshini
Tay
Taye
Terrace
Teslin
The Three Guardsmen
Thistle
Thomas
Thompson
*Thron-diuck*
*Til-e-i-tsho*
Tillei
Tintina
*Tlet-tlan-a-tsoots*
Too-flat
Too-much-gold
*Too-tlas*
Tower
Traffic
Tummel
Tustles
Tyers
Unahini
Vancouver
Vesuvius
Von Wilczek
Vowle
Walker
Ward
Watson
Wellesley
Wesketahin
Wheaton
White
Whitehorse
Whitestone
Wilson
Windy
Wolf
Woodside
Yukon

## COUNTIES AND DISTRICTS IN CANADA.

### New Brunswick.

Albert
Carleton
Charlotte
Gloucester
Kent
Kings
Madawaska
Northumberland
Queens
Restigouche
St. John
Sunbury
Victoria
Westmorland
York

### Nova Scotia.

Annapolis
Antigonish
Cape Breton
Colchester
Cumberland
Digby
Guysborough
Halifax
Hants
Inverness
Kings
Lunenburg
Pictou
Queens
Richmond
Shelburne
Victoria
Yarmouth

### Ontario.

Addington
Algoma (district)
Brant
Bruce
Carleton
Dufferin
Dundas
Durham
Elgin
Essex
Frontenac
Glengarry
Grenville
Grey
Haldimand
Haliburton
Halton
Hastings
Huron
Kenora (district)
Kent
Lambton
Lanark
Leeds
Lennox
Lincoln
Manitoulin (district)
Middlesex
Muskoka (district)
Nipissing (district)
Norfolk

## COUNTIES AND DISTRICTS IN CANADA—*Concluded.*

Northumberland
Ontario
Oxford
Parry Sound (district)
Patricia (district)
Peel
Perth
Peterborough
Prescott
Prince Edward
Rainy River (district)
Renfrew
Russell
Simcoe
Stormont
Sudbury (district)
Thunder Bay (district)
Timiskaming (district)
Victoria
Waterloo
Welland
Wellington
Wentworth
York

### Prince Edward Island.

Kings
Prince
Queens

### Quebec.

Abitibi (territory)
Argenteuil
Arthabaska
Ashuanipi (territory)
Bagot
Beauharnois
Beauce
Bellechasse
Berthier
Bonaventure
Brome
Chambly
Champlain
Charlevoix
Chateauguay
Chicoutimi
Compton
Dorchester
Drummond
Frontenac
Gaspe
Hochelaga
Huntingdon
Iberville
Jacques Cartier
Joliette
Kamouraska
Labelle
Lake St. John
Laprairie
L'Assomption
Laval
Lévis
L'Islet
Lotbinière
Maisonneuve
Matane
Maskinongé
Megantic
Missisquoi
Mistassini (territory)
Montcalm
Montmagny
Montmorency
Napierville
New Quebec (territory)
Nicolet
Ottawa
Pontiac
Portneuf
Quebec
Richelieu
Richmond
Rimouski
Rouville
Saguenay
Shefford
Sherbrooke
Soulanges
Stanstead
St. Hyacinthe
St. Johns
St. Maurice
Temiscouata
Terrebonne
Timiskaming
Two Mountains
Vaudreuil
Verchères
Westmount
Wolfe
Yamaska

## TOWNSHIPS IN ONTARIO.

| Township. | County or District. |
|---|---|
| Aberdeen | Algoma. |
| Abinger | Addington. |
| Adams | Timiskaming. |
| Adelaide | Middlesex. |
| Adjala | Simcoe. |
| Admaston | Renfrew. |
| Adolphustown | Lennox. |
| Airy | Nipissing. |
| Afton | Sudbury. |
| Albemarle | Bruce. |
| Albert | Algoma. |
| Albion | Peel. |
| Aldborough | Elgin. |
| Alexandra | Timiskaming. |
| Alfred | Prescott. |
| Algona, North | Renfrew. |
| Algona, South | " |
| Alice | " |
| Allan | Manitoulin. |
| Allen | Sudbury. |
| Alma | Timiskaming. |
| Alnwick | Northumberland. |
| Amabel | Bruce. |
| Amaranth | Dufferin. |
| Ameliasburg | Prince Edward. |
| Ames | Thunder Bay. |
| Amherst Island | Lennox. |
| Amundsen | Algoma. |
| Amyot | Sudbury. |
| Ancaster | Wentworth. |
| Anderdon | Essex. |
| Anderson | Algoma. |
| Anglesea | Addington. |
| Anglin | Nipissing. |
| Anson | Haliburton. |
| Anstruther | Peterborough. |
| Antoine | Nipissing. |
| Appleby | Sudbury. |
| Arcadia | " |
| Archibald | Algoma. |
| Argyle | Timiskaming. |
| Armagh | Sudbury. |
| Armour | Parry Sound. |
| Armstrong | Timiskaming. |
| Arnold | " |
| Arran | Bruce. |
| Artemesia | Grey. |
| Arthur | Wellington. |
| Ashby | Addington. |
| Ashfield | Huron. |
| Askin | Nipissing. |
| Asphodel | Peterborough. |
| Asquith | Sudbury. |
| Assiginack | Manitoulin. |
| Aston | Nipissing. |
| Athol | Prince Edward. |
| Atwood | Rainy River |
| Aubin | Timiskaming. |
| Aubrey | Kenora. |
| Auden | Algoma. |
| Augusta | Grenville. |
| Auld | Timiskaming. |
| Aurora | Timiskaming. |
| Awenge | Algoma. |
| Aweres | " |
| Awrey | Sudbury. |
| Aylmer | " |
| Aylsworth | Rainy River. |
| Baden | Timiskaming. |
| Badgerow | Nipissing. |
| Bagot | Renfrew. |
| Bain | Thunder Bay. |
| Baldwin | Sudbury. |
| Balfour | " |
| Ballantyne | Nipissing. |
| Bangor | Hastings. |
| Banks | Timiskaming. |
| Bannerman | Algoma. |
| Bannockburn | Timiskaming. |
| Barber | " |
| Barker | Algoma. |
| Barlow | Thunder Bay. |
| Barnet | Timiskaming. |
| Barr | " |
| Barrie | Frontenac. |
| Barrie Island | Manitoulin. |
| Barron | Nipissing. |
| Bartlett | Timiskaming. |
| Barton | Wentworth. |
| Barwick | Rainy River. |
| Bastard | Leeds. |
| Bastedo | Nipissing. |
| Bathurst | Lanark. |
| Baxter | Muskoka. |
| Bayham | Elgin. |
| Bayly | Timiskaming. |
| Beardmore | " |
| Beaucage | Nipissing. |
| Beatty | " |
| Beauchamp | Timiskaming. |
| Beaumont | Sudbury. |
| Beck | Timiskaming. |
| Beckwith | Lanark. |
| Bedford | Frontenac. |
| Beemer | Sudbury. |
| Belfast | Nipissing. |
| Bell | Thunder Bay. |
| Belmont | Peterborough. |
| Bennett | Rainy River. |
| Ben Nevis | Timiskaming. |
| Benneweiss | Sudbury. |
| Benoit | Timiskaming. |
| Bentinck | Grey. |
| Beresford | Sudbury. |
| Bernhardt | Timiskaming. |
| Berry | " |
| Bertie | Welland. |
| Bertram | Nipissing. |
| Bethune | Parry Sound. |
| Beulah | Sudbury. |
| Beverly | Wentworth. |
| Bexley | Victoria. |
| Bicknell | Algoma. |

## TOWNSHIPS IN ONTARIO—*Continued.*

| Township. | County or District. |
|---|---|
| Biddulph | Middlesex. |
| Bidwell | Manitoulin. |
| Bigelow | Sudbury. |
| Biggar | Nipissing. |
| Bigwood | Sudbury. |
| Billings | Manitoulin. |
| Binbrook | Wentworth. |
| Bishop | Nipissing. |
| Bisley | Timiskaming. |
| Black | " |
| Blackstock | Nipissing. |
| Blain | Timiskaming. |
| Blair | Parry Sound. |
| Blake | Thunder Bay. |
| Blandford | Oxford. |
| Blanshard | Perth. |
| Blenheim | Oxford. |
| Blewett | Sudbury. |
| Blezard | " |
| Blount | Timiskaming. |
| Blue | Rainy River. |
| Blyth | Nipissing. |
| Blithfield | Renfrew. |
| Bompas | Timiskaming. |
| Bond | " |
| Bonfield | Nipissing. |
| Bonis | Timiskaming. |
| Booth | Thunder Bay. |
| Borden | Sudbury. |
| Bosanquet | Lambton. |
| Boston | Timiskaming. |
| Botha | Sudbury. |
| Boulter | Nipissing. |
| Bowell | Sudbury. |
| Bower | Nipissing. |
| Bowman | Timiskaming. |
| Bowyer | " |
| Boyce | Algoma. |
| Boyd | Nipissing. |
| Bradburn | Timiskaming. |
| Brant | Bruce. |
| Brantford | Brant. |
| Brethour | Timiskaming. |
| Brewster | " |
| Bridgland | Algoma. |
| Bright | " |
| Brighton | Northumberland. |
| Briggs | Nipissing. |
| Brigstocke | Timiskaming. |
| Bristol | " |
| Britton | Kenora. |
| Brock | Ontario. |
| Broder | Sudbury. |
| Bromley | Renfrew. |
| Bronson | Nipissing. |
| Brooke | Lambton. |
| Broughham | Renfrew. |
| Brower | Timiskaming. |
| Brown | Parry Sound. |
| Browning | Sudbury. |
| Bruce | Bruce. |
| Brudenell | Renfrew. |
| Brunel | Muskoka. |
| Brunet | Sudbury. |
| Brunswick | " |
| Bruton | Haliburton. |
| Bryce | Timiskaming. |
| Buchan | Algoma. |
| Buchanan | Renfrew. |
| Bucke | Timiskaming. |
| Buller | Kenora. |
| Burford | Brant. |
| Burgess, North | Lanark. |
| Burgess, South | Leeds. |
| Burk | Kenora. |
| Burleigh | Peterborough. |
| Burns | Renfrew. |
| Burpee | Parry Sound. |
| Burpee | Manitoulin. |
| Burrell | Algoma. |
| Burriss | Rainy River. |
| Burritt | Sudbury. |
| Burrows | " |
| Burt | Timiskaming. |
| Burton | Parry Sound. |
| Burwash | Sudbury. |
| Butt | Nipissing. |
| Byers | Timiskaming. |
| Byron | Thunder Bay. |
| Cabot | Sudbury. |
| Cairo | Timiskaming. |
| Caistor | Lincoln. |
| Caithness | Algoma. |
| Calder | Timiskaming. |
| Caldwell | Nipissing. |
| Caledon | Peel. |
| Caledonia | Prescott. |
| Calvert | Nipissing. |
| Calvin | " |
| Cambridge | Russell. |
| Camden | Kent. |
| Camden East | Addington. |
| Cameron | Nipissing. |
| Campbell | Manitoulin. |
| Canborough | Haldimand. |
| Cane | Timiskaming. |
| Canisbay | Nipissing. |
| Canonto, North | Frontenac. |
| Canonto, South | " |
| Canton | Nipissing. |
| Capreol | Sudbury. |
| Caradoc | Middlesex. |
| Carden | Victoria. |
| Cardiff | Haliburton. |
| Cardwell | Muskoka. |
| Carling | Parry Sound. |
| Carlow | Hastings. |
| Carlyle | Manitoulin. |
| Carman | Timiskaming. |
| Carnarvon | Manitoulin. |
| Carnegie | Timiskaming. |
| Carney | Algoma. |
| Carpenter | Rainy River. |
| Carr | Timiskaming. |
| Carrick | Bruce. |
| Carscallen | Timiskaming. |
| Carter | Sudbury. |
| Cartier | " |
| Cartwright | Durham. |
| Cascaden | Sudbury. |
| Casey | Timiskaming. |
| Casgrain | Algoma. |
| Cashel | Hastings. |
| Casimir | Sudbury. |
| Cassels | Nipissing. |

## TOWNSHIPS IN ONTARIO—*Continued.*

| Township. | County or District. |
|---|---|
| Catharine | Timiskaming. |
| Cavan | Durham. |
| Cavendish | Peterborough. |
| Cayuga, North | Haldimand. |
| Cayuga, South | " |
| Chaffey | Muskoka. |
| Chamberlain | Timiskaming. |
| Chambers | Nipissing. |
| Champagne | Sudbury. |
| Chandos | Peterborough. |
| Chapleau | Sudbury. |
| Chapman | Parry Sound. |
| Charlottenburg | Glengarry. |
| Charlotteville | Norfolk. |
| Charlton | Nipissing. |
| Charters | Timiskaming. |
| Chatham | Kent. |
| Cherriman | Sudbury. |
| Chesley | Algoma. |
| Chenier | Sudbury. |
| Chewett | " |
| Childerhose | Timiskaming. |
| Chinguacousy | Peel. |
| Chipman | Thunder Bay. |
| Chisholm | Nipissing. |
| Chown | Timiskaming. |
| Christie | Parry Sound. |
| Churchill | Sudbury. |
| Clancy | Nipissing. |
| Clara | Renfrew. |
| Clarence | Russell. |
| Clarendon | Frontenac. |
| Clarke | Durham. |
| Clary | Sudbury. |
| Clavet | Algoma. |
| Cleaver | Timiskaming. |
| Cleland | Sudbury. |
| Clement | " |
| Clergue | Timiskaming. |
| Clifford | " |
| Clinton | Lincoln. |
| Clouston | Algoma. |
| Clute | Timiskaming. |
| Clyde | Haliburton. |
| Cobden | Algoma. |
| Cochrane | Sudbury. |
| Cockburn Island | Manitoulin. |
| Coderre | Algoma. |
| Cody | Timiskaming. |
| Colborne | Huron. |
| Colchester, North | Essex. |
| Colchester, South | " |
| Cole | Timiskaming. |
| Coleman | " |
| Colenso | Kenora. |
| Collingwood | Grey. |
| Collins | Sudbury. |
| Colquhoun | Timiskaming. |
| Commanda | Nipissing. |
| Conger | Parry Sound. |
| Connee | Thunder Bay. |
| Connaught | Sudbury. |
| Cook | Timiskaming. |
| Corkill | " |
| Corley | " |
| Cornwall | Stormont. |
| Cosby | Sudbury. |
| Coté | Timiskaming. |
| Cotton | Sudbury. |
| Coulson | Timiskaming. |
| Cox | Sudbury. |
| Craig | " |
| Cramahe | Northumberland. |
| Crawford | Timiskaming. |
| Creelman | Sudbury. |
| Creighton | " |
| Crerar | Nipissing. |
| Croft | Parry Sound. |
| Crooks | Thunder Bay. |
| Crosby, North | Leeds. |
| Crosby, South | " |
| Crothers | Sudbury. |
| Crowland | Welland. |
| Crozier | Rainy River. |
| Culross | Bruce. |
| Cumberland | Russell. |
| Curran | Rainy River. |
| Currie | Timiskaming. |
| Curtis | Algoma. |
| Dack | Timiskaming. |
| Dalhousie | Lanark. |
| Dalton | Victoria. |
| Dana | Nipissing. |
| Dance | Rainy River. |
| Dane | Timiskaming. |
| D'Arcy | Sudbury. |
| Dargavel | Timiskaming. |
| Darling | Lanark. |
| Darlington | Durham. |
| Davidson | Timiskaming. |
| Davin | Algoma. |
| Davis | Sudbury. |
| Dawn | Lambton. |
| Dawson | Manitoulin. |
| Day | Algoma. |
| Deacon | Nipissing. |
| Delamere | Sudbury. |
| Delaware | Middlesex. |
| Delhi | Sudbury. |
| Deloro | Timiskaming. |
| De Morest | Sudbury. |
| Denbigh | Addington. |
| Denison | Sudbury. |
| Dennis | Algoma. |
| Denton | Timiskaming. |
| Derby | Grey. |
| Dereham | Oxford. |
| Derochie | Algoma. |
| Devine | Nipissing. |
| Devitt | Algoma. |
| Devlin | Rainy River. |
| Dewart | " |
| Dickens | Nipissing. |
| Dickson | " |
| Digby | Victoria. |
| Dilke | Rainy River. |
| Dill | Sudbury. |
| Doble | Rainy River. |
| Doherty | Algoma. |
| Dokis | Timiskaming. |
| Donovan | " |
| Doon | " |
| Dorchester, North | Middlesex. |
| Dorchester, South | Elgin. |
| Dorion | Thunder Bay. |

## TOWNSHIPS IN ONTARIO—*Continued.*

| Township. | County or District. |
|---|---|
| Douglas | Timiskaming. |
| Douro | Peterborough. |
| Dover, East | Kent. |
| Dover, West | " |
| Dowling | Sudbury. |
| Downie | Perth. |
| Doyle | Timiskaming. |
| Draper | Muskoka. |
| Drayton | Kenora. |
| Drummond | Lanark. |
| Drury | Sudbury. |
| Dryden | " |
| Dudley | Haliburton. |
| Duff | Timiskaming. |
| Dufferin | " |
| Dumfries, North | Waterloo. |
| Dumfries, South | Brant. |
| Dummer | Peterborough. |
| Dunbar | Sudbury. |
| Duncan | Algoma. |
| Dundee | Sudbury. |
| Dundonald | Timiskaming. |
| Dungannon | Hastings. |
| Dunlop | Sudbury. |
| Dunmore | Timiskaming. |
| Dunn | Haldimand. |
| Dunnet | Sudbury. |
| Dunwich | Elgin. |
| Dymond | Timiskaming. |
| Dysart | Haliburton. |
| Easthope, North | Perth. |
| Easthope, South | " |
| Eastnor | Bruce. |
| Ebbs | Algoma. |
| Eby | Timiskaming. |
| Eddy | Nipissing. |
| Edgar | " |
| Edwards | Timiskaming. |
| Edwardsburgh | Grenville. |
| Effingham | Addington. |
| Egan | Timiskaming. |
| Egremont | Grey. |
| Eilber | Algoma. |
| Ekfrid | Middlesex. |
| Elderslie | Bruce. |
| Eldon | Victoria. |
| Eldorado | Timiskaming. |
| Elizabethtown | Leeds. |
| Ellice | Perth. |
| Elliott | Timiskaming. |
| Ellis | Sudbury. |
| Elma | Perth. |
| Elmsley, North | Lanark. |
| Elmsley, South | Leeds. |
| Elzevir | Hastings. |
| Emerald | Sudbury. |
| Emily | Victoria. |
| Emo | Sudbury. |
| English | " |
| Ennisikillen | Lambton. |
| Ennismore | Peterborough. |
| Eramosa | Wellington. |
| Erin | " |
| Ermatinger | Sudbury. |
| Ernestown | Lennox. |
| Escott | Leeds. |
| Esquesing | Halton. |
| Essa | Simcoe. |
| Esten | Algoma. |
| Etobicoke | York. |
| Eton | Kenora. |
| Euphemia | Lambton. |
| Euphrasia | Grey. |
| Evanturel | Timiskaming. |
| Evelyn | " |
| Eyre | Haliburton |
| Fairbairn | Sudbury. |
| Fairbank | " |
| Falconbridge | " |
| Falconer | Nipissing. |
| Fallon | Timiskaming. |
| Faraday | Hastings. |
| Farr | Timiskaming. |
| Farrington | Rainy River. |
| Fasken | Timiskaming. |
| Fauquier | " |
| Fawcett | Sudbury. |
| Fell | Nipissing. |
| Fenelon | Victoria. |
| Fenwick | Algoma. |
| Ferguson | Parry Sound. |
| Fernow | Thunder Bay. |
| Ferrie | Parry Sound. |
| Ferris | Nipissing. |
| Field | " |
| Finch | Stormont. |
| Findlay | Timiskaming. |
| Finlayson | Nipissing. |
| Fintry | Algoma. |
| Firstbrook | Timiskaming. |
| Fisher | Algoma. |
| Fitzgerald | Nipissing. |
| Fitzroy | Carleton. |
| Flamborough, East | Wentworth. |
| Flamborough, West | " |
| Flavelle | Timiskaming. |
| Fleck | Algoma. |
| Fleming | Rainy River. |
| Flos | Simcoe. |
| Foley | Parry Sound. |
| Foster | Sudbury. |
| Fournier | Timiskaming. |
| Fox | Nipissing. |
| Foy | Sudbury. |
| Fraleck | " |
| Fraleigh | Thunder Bay. |
| Franklin | Muskoka. |
| Franz | Algoma. |
| Fraser | Renfrew. |
| Frechette | Sudbury. |
| Fredericksburg, North | Lennox. |
| Fredericksburg, South | " |
| Freeman | Muskoka. |
| French | Nipissing. |
| Freswick | " |
| Fripp | Timiskaming. |
| Fullarton | Perth. |
| Fushimi | Algoma. |
| Gainsborough | Lincoln. |
| Galbraith | Algoma. |
| Gallagher | Sudbury. |
| Galna | Timiskaming. |
| Galway | Peterborough. |
| Gamble | Timiskaming. |
| Gamey | Sudbury. |

## TOWNSHIPS IN ONTARIO—*Continued.*

| Township. | County or District. |
|---|---|
| Garafraxa, East | Dufferin. |
| Garafraxa, West | Wellington. |
| Garibaldi | Sudbury. |
| Garrow | Nipissing. |
| Garson | Sudbury. |
| Garvey | " |
| Gaudette | Algoma. |
| Gauthier | Timiskaming. |
| Geary | " |
| Gelkie | " |
| Georgina | York. |
| German | Timiskaming. |
| Gibbons | Nipissing. |
| Gibson | Muskoka. |
| Gill | Algoma. |
| Gillies | Thunder Bay. |
| Gillmor | Algoma. |
| Glackmeyer | Timiskaming. |
| Gladman | Nipissing. |
| Gladstone | Algoma. |
| Glamorgan | Haliburton. |
| Glanford | Wentworth. |
| Glenelg | Grey. |
| Gloucester | Carleton. |
| Goderich | Huron. |
| Godfrey | Timiskaming. |
| Goldwin | Algoma. |
| Gooderham | Nipissing. |
| Goodwin | Thunder Bay. |
| Gordon | Manitoulin. |
| Gorham | Thunder Bay. |
| Goschen | Sudbury. |
| Gosfield, North | Essex. |
| Gosfield, South | " |
| Gough | Sudbury. |
| Gouin | " |
| Goulbourn | Carleton. |
| Gould | Algoma. |
| Gowan | Timiskaming. |
| Gower, North | Carleton. |
| Gower, South | Grenville. |
| Graham | Sudbury. |
| Grant | Nipissing. |
| Grantham | Lincoln. |
| Grasett | Algoma. |
| Grattan | Renfrew. |
| Greenock | Bruce. |
| Grenfell | Timiskaming. |
| Grey | Huron. |
| Griffith | Renfrew. |
| Grigg | Sudbury. |
| Grimsby, North | Lincoln. |
| Grimsby, South | " |
| Grimsthorpe | Hastings. |
| Gross | Timiskaming. |
| Groves | Sudbury. |
| Guelph | Wellington. |
| Gulbord | Timiskaming. |
| Gullford | Haliburton. |
| Gurd | Parry Sound. |
| Gurney | Timiskaming |
| Guthrie | Nipissing. |
| Gwillimbury, North | York. |
| Gwillimbury, East | " |
| Gwillimbury, West | Simcoe. |
| Haddo | Sudbury. |
| Haentschel | " |
| Hagar | " |
| Hagarty | Renfrew. |
| Hagerman | Parry Sound. |
| Haggart | Timiskaming. |
| Haldimand | Northumberland. |
| Halkirk | Rainy River. |
| Hallam | Sudbury. |
| Halliday | Sudbury. |
| Hallowell | Prince Edward. |
| Hamilton | Northumberland. |
| Hammell | Nipissing. |
| Hanlan | Algoma. |
| Hanmer | Sudbury. |
| Hanna | Timiskaming. |
| Harburn | Haliburton. |
| Harcourt | " |
| Hardiman | Sudbury. |
| Hardy | Parry Sound. |
| Harley | Timiskaming. |
| Harris | " |
| Harrison | Parry Sound. |
| Harrow | Sudbury. |
| Hart | " |
| Hartman | Kenora. |
| Harty | Sudbury. |
| Harvey | Peterborough. |
| Harwich | Kent. |
| Hassard | Sudbury. |
| Haughton | Algoma. |
| Haultain | Timiskaming. |
| Havelock | Haliburton. |
| Havilland | Algoma. |
| Hawkesbury, East | Prescott. |
| Hawkesbury, West | " |
| Hawkins | Algoma. |
| Hawley | Sudbury. |
| Hay | Huron. |
| Haycock | Kenora. |
| Hayward | Algoma. |
| Hazen | Sudbury. |
| Head | Renfrew. |
| Hearst | Timiskaming |
| Henderson | Thunder Bay. |
| Hendrie | Sudbury. |
| Hennessy | " |
| Henry | " |
| Henwood | Timiskaming |
| Herrick | Algoma. |
| Herschell | Hastings. |
| Hess | Sudbury |
| Hibbert | Perth |
| Hillary | Timiskaming |
| Hilliard | " |
| Hillier | Prince Edward |
| Hilton | Algoma |
| Himsworth, North | Parry Sound |
| Himsworth, South | " |
| Hinchinbrooke | Frontenac. |
| Hincks | Timiskaming |
| Hindon | Haliburton |
| Hislop | Timiskaming |
| Hobbs | Nipissing |
| Hodgetts | Sudbury |
| Hodgins | Algoma |
| Hogarth | Thunder Bay |
| Holland | Grey |
| Holmes | Timiskaming |

## TOWNSHIPS IN ONTARIO—*Continued.*

| Township. | County or District. |
|---|---|
| Homer | Thunder Bay. |
| Hope | Durham. |
| Horton | Renfrew. |
| Hoskin | Sudbury. |
| Houghton | Norfolk. |
| Howard | Kent. |
| Howe Island | Frontenac. |
| Howey | Sudbury. |
| Howick | Huron. |
| Howland | Manitoulin. |
| Hoyle | Timiskaming. |
| Hudson | " |
| Hugel | Nipissing. |
| Hullett | Huron. |
| Humberstone | Welland. |
| Humboldt | Manitoulin. |
| Humphrey | Parry Sound. |
| Hungerford | Hastings. |
| Hunter | Nipissing. |
| Huntingdon | Hastings. |
| Huntley | Carleton. |
| Huron | Bruce. |
| Hutt | Sudbury. |
| Hutton | " |
| Hyman | " |
| Idington | Algoma. |
| Ingram | Timiskaming. |
| Innes | Thunder Bay. |
| Innisfil | Simcoe. |
| Irving | Algoma. |
| Ivanhoe | Sudbury. |
| Jack | " |
| Jacques | Thunder Bay. |
| Jaffray | Kenora. |
| James | Timiskaming. |
| Jamieson | " |
| Janes | Sudbury. |
| Jarvis | Algoma. |
| Jessop | Timiskaming. |
| Jennings | Sudbury. |
| Jocelyn | Algoma. |
| Johnson | " |
| Joly | Parry Sound. |
| Jones | Renfrew. |
| Kaladar | Addington. |
| Kapuskasing | Algoma. |
| Kars | " |
| Katrine | Timiskaming. |
| Keefer | " |
| Keely | Nipissing. |
| Kehoe | Algoma. |
| Keith | Sudbury. |
| Kelly | " |
| Kelvin | " |
| Kemp | " |
| Kendall | Algoma. |
| Kendrey | Timiskaming. |
| Kennebec | Frontenac. |
| Kennedy | Timiskaming. |
| Kenny | Nipissing. |
| Kenogaming | Sudbury. |
| Kenyon | Glengarry. |
| Keppel | Grey. |
| Kerns | Timiskaming. |
| Kerrs | " |
| Kimberley | " |
| Kincaid | Algoma. |
| Kincardine | Bruce. |
| Kidd | Timiskaming. |
| King | York. |
| Kingsford | Rainy River. |
| Kingsmill | Timiskaming. |
| Kingston | Frontenac. |
| Kinloss | Bruce. |
| Kirkland | Timiskaming. |
| Kirkpatrick | Nipissing. |
| Kirkwall | Algoma. |
| Kirkwood | " |
| Kitchener | Sudbury. |
| Kitley | Leeds. |
| Kittson | Timiskaming. |
| Klock | " |
| Klotz | Thunder Bay. |
| Knight | Timiskaming. |
| Knox | " |
| Kohler | Algoma. |
| Korah | " |
| Lackner | Sudbury. |
| Ladysmith | Kenora. |
| Laidlaw | Algoma. |
| Laird | " |
| Lake | Hastings. |
| Lamarche | Timiskaming. |
| Lampman | Sudbury. |
| Lanark | Lanark. |
| Lancaster | Glengarry. |
| Landry | Algoma. |
| Langmuir | Timiskaming. |
| Langton | Kenora. |
| Lansdowne | Leeds. |
| Lash | Rainy River. |
| Latchford | Nipissing. |
| Lauder | " |
| Laura | Sudbury. |
| Laurier | Parry Sound. |
| Lavant | Lanark. |
| Law | Nipissing. |
| Lawrence | Haliburton. |
| Lawson | Timiskaming. |
| Laxton | Victoria. |
| Leask | Sudbury. |
| Lebel | Timiskaming. |
| Leckie | " |
| Ledger | Thunder Bay. |
| Lee | Timiskaming. |
| Leeds | Leeds. |
| Lefroy | Algoma. |
| Legge | " |
| Leitch | Timiskaming. |
| Leith | " |
| Lennox | " |
| Leo | " |
| Leonard | " |
| LeRoche | Nipissing. |
| Lerwick | Algoma. |
| Levack | Sudbury. |
| Lewis | Algoma. |
| Ley | " |
| Limerick | Hastings. |
| Lindsay | Bruce. |
| Lister | Nipissing. |
| Little | Timiskaming. |
| Livingstone | Haliburton. |
| Lobo | Middlesex. |

## TOWNSHIPS IN ONTARIO—*Continued.*

| Township. | County or District. |
|---|---|
| Lochiel | Glengarry. |
| Lockhart | Nipissing. |
| Logan | Perth. |
| London | Middlesex. |
| Londonderry | Sudbury. |
| Long | Algoma. |
| Longford | Victoria. |
| Longueuil | Prescott. |
| Lorne | Sudbury. |
| Lorrain | Timiskaming. |
| Loudon | Nipissing. |
| Loughborough | Frontenac. |
| Lougheed | Algoma. |
| Loughrin | Sudbury. |
| Louise | " |
| Lount | Parry Sound. |
| Louth | Lincoln. |
| Lowther | Algoma. |
| Loveland | Timiskaming. |
| Low | Thunder Bay. |
| Lucas | Timiskaming. |
| Lumsden | Sudbury. |
| Lundy | Timiskaming. |
| Luther, East | Dufferin. |
| Luther, West | Wellington. |
| Lutterworth | Haliburton. |
| Lybster | Thunder Bay. |
| Lyell | Nipissing. |
| Lyman | " |
| Lyndoch | Renfrew. |
| Lyon | Thunder Bay. |
| Mabee | Timiskaming. |
| McArthur | " |
| Macaulay | Muskoka. |
| Macbeth | Sudbury. |
| McBride | " |
| McCallum | Nipissing. |
| McCann | Timiskaming |
| McCart | " |
| McCarthy | Sudbury. |
| McCaul | Rainy River. |
| M'Clintock | Haliburton. |
| M'Clure | Hastings. |
| McCoig | Algoma. |
| McConkey | Parry Sound. |
| McConnell | Sudbury. |
| McCool | Timiskaming. |
| McCrae | Algoma. |
| McCraney | Nipissing. |
| McCrosson | Rainy River |
| Macdiarmid | Timiskaming. |
| Macdonald | Algoma. |
| McDougall | Parry Sound. |
| McElroy | Timiskaming. |
| McEvay | " |
| McFadden | " |
| McGarry | " |
| McGee | Sudbury. |
| McGiffin | Timiskaming. |
| McGillivray | Middlesex. |
| McGiverin | Algoma. |
| McGowan | " |
| McGregor | Thunder Bay. |
| Machar | Parry Sound. |
| Machin | Timiskaming. |
| McIntyre | Thunder Bay. |
| McIrvine | Rainy River. |
| Mack | Algoma. |
| McKay | Renfrew. |
| Mackelcan | Sudbury. |
| McKellar | Parry Sound. |
| McKenzie | " |
| McKeown | Timiskaming. |
| McKillop | Huron. |
| McKim | Sudbury. |
| Mackinnon | " |
| McLaren | Nipissing. |
| McLaughlin | " |
| McLean | Muskoka. |
| Macklem | Timiskaming. |
| Maclennan | Sudbury. |
| McLeod | " |
| McMahon | Algoma. |
| McMillan | " |
| McMurchy | Sudbury. |
| McMurrich | Parry Sound. |
| McNab | Renfrew. |
| McNamara | Sudbury. |
| McNaught | " |
| McNeil | Timiskaming. |
| McNish | Sudbury. |
| McTavish | Thunder Bay. |
| McVittie | Timiskaming. |
| McWilliams | Nipissing. |
| Macpherson | Nipissing. |
| Madoc | Hastings. |
| Mafeking | Kenora. |
| Mahaffy | Timiskaming. |
| Maidstone | Essex. |
| Maisonville | Timiskaming. |
| Malachi | Kenora. |
| Malahide | Elgin. |
| Malden | Essex. |
| Mann | Timiskaming. |
| Manvers | Durham. |
| Mara | Ontario. |
| Marathon | Timiskaming. |
| March | Carleton. |
| Marconi | Sudbury. |
| Maria | Renfrew. |
| Mariposa | Victoria. |
| Markham | York. |
| Marks | Thunder Bay. |
| Marlborough | Carleton. |
| Marmora | Hastings. |
| Marquis | Timiskaming. |
| Marshay | Sudbury. |
| Marter | Timiskaming |
| Martin | Algoma. |
| Martland | Sudbury. |
| Maryborough | Wellington. |
| Marysburg, North | Prince Edward. |
| Marysburg, South | " |
| Mason | Sudbury. |
| Massey | Timiskaming |
| Master | Nipissing |
| Matawatchan | Renfrew. |
| Matchedash | Simcoe. |
| Mather | Rainy River. |
| Matheson | Timiskaming |
| Mathieu | Rainy River. |
| Matilda | Dundas. |
| Mattagami | Sudbury. |
| Mattawan | Nipissing. |

## TOWNSHIPS IN ONTARIO—*Continued.*

| Township. | County or District. |
|---|---|
| May | Sudbury. |
| Mayo | Hastings. |
| Medina | Timiskaming. |
| Medonte | Simcoe. |
| Medora | Muskoka. |
| Melancthon | Dufferin. |
| Melba | Timiskaming. |
| Melick | Kenora. |
| Melgund | " |
| Meredith | Algoma. |
| Merick | Nipissing. |
| Merritt | Sudbury. |
| Mersea | Essex. |
| Metcalfe | Middlesex. |
| Methuen | Peterborough. |
| Michaud | Timiskaming. |
| Michie | " |
| Mickle | " |
| Middleboro | Sudbury. |
| Middleton | Norfolk. |
| Midlothian | Timiskaming. |
| Miller | Frontenac. |
| Milligan | Timiskaming. |
| Mills | Parry Sound. |
| Mills | Manitoulin. |
| Milne | Nipissing. |
| Milner | Timiskaming. |
| Minden | Haliburton. |
| Minto | Wellington. |
| Miramichi | Sudbury. |
| Miscampbell | Rainy River. |
| Moberly | Sudbury. |
| Moffat | " |
| Moher | " |
| Monaghan, North | Peterborough. |
| Monaghan, South | Northumberland. |
| Monck | Muskoka. |
| Moncrieff | Sudbury. |
| Mond | " |
| Monmouth | Haliburton. |
| Mono | Dufferin. |
| Montague | Lanark. |
| Monteagle | Hastings. |
| Monteith | Parry Sound. |
| Montgomery | Algoma. |
| Montrose | Timiskaming. |
| Moody | " |
| Moore | Lambton. |
| Moorehouse | Algoma. |
| Morel | Timiskaming. |
| Morgan | Sudbury. |
| Morin | Algoma. |
| Morley | Rainy River. |
| Mornington | Perth. |
| Morris | Huron. |
| Morrisette | Timiskaming. |
| Morrison | Muskoka. |
| Morson | Rainy River. |
| Mortimer | Timiskaming. |
| Mosa | Middlesex. |
| Moss | Thunder Bay. |
| Moulton | Haldimand. |
| Mountain | Dundas. |
| Mountjoy | Timiskaming. |
| Mowat | Parry Sound. |
| Mulligan | Timiskaming. |
| Mulloy | Algoma. |
| Mulmur | Dufferin. |
| Mulock | Nipissing. |
| Mulvey | Algoma. |
| Munro | Timiskaming. |
| Murchison | Nipissing. |
| Murphy | Timiskaming. |
| Murray | Northumberland. |
| Musgrove | Timiskaming. |
| Muskego | Sudbury. |
| Muskoka | Muskoka. |
| Mutrie | Kenora. |
| Nairn | Sudbury. |
| Nansen | Timiskaming. |
| Nassagaweya | Halton. |
| Natal | Sudbury. |
| Neebing | Thunder Bay. |
| Neelon | Sudbury. |
| Neely | Algoma. |
| Nelles | Rainy River |
| Nelson | Halton. |
| Nepean | Carleton. |
| Nesbitt | Timiskaming. |
| Newmarket | " |
| Niagara | Lincoln. |
| Nichol | Wellington. |
| Nicol | Timiskaming. |
| Nightingale | Haliburton. |
| Nipigon | Thunder Bay. |
| Nipissing | Parry Sound. |
| Nissouri, East | Oxford. |
| Nissouri, West | Middlesex. |
| Niven | Nipissing. |
| Nixon | Timiskaming. |
| Noble | Sudbury. |
| Nordica | Timiskaming. |
| Norman | Sudbury. |
| Normanby | Grey. |
| Northrup | Sudbury. |
| Norwich, North | Oxford. |
| Norwich, South | " |
| Notman | Nipissing. |
| Nottawasaga | Simcoe. |
| Nursey | Sudbury. |
| Oakland | Brant. |
| Oakley | Muskoka. |
| Oates | Sudbury. |
| O'Brien | Timiskaming. |
| O'Connor | Thunder Bay. |
| Ogden | Timiskaming. |
| Ogilvie | Sudbury. |
| Olden | Frontenac. |
| Olive | Nipissing. |
| Oliver | Thunder Bay. |
| Olrig | Nipissing. |
| O'Meara | Thunder Bay. |
| Onaping | Sudbury. |
| Oneida | Haldimand. |
| Onondaga | Brant. |
| Ops | Victoria. |
| Orford | Kent. |
| Orillia, North | Simcoe. |
| Orillia, South | " |
| Orkney | Algoma. |
| Oro | Simcoe. |
| Osborne | Nipissing. |

## TOWNSHIPS IN ONTARIO—*Continued.*

| Township. | County or District. |
|---|---|
| Osgoode | Carleton. |
| Osler | Nipissing. |
| Osnabruck | Stormont. |
| Oso | Frontenac. |
| Ossian | Timiskaming. |
| Osprey | Grey. |
| Otonabee | Peterborough. |
| Ottaway | Timiskaming. |
| Otter | Algoma. |
| Otto | Timiskaming. |
| Owens | " |
| Oxford | Grenville. |
| Oxford, North | Oxford. |
| Oxford, East | " |
| Oxford, West | " |
| Pacaud | Timiskaming. |
| Paipoonge | Thunder Bay. |
| Pakenham | Lanark. |
| Palmer | Algoma. |
| Palmerston | Frontenac. |
| Papineau | Nipissing. |
| Pardee | Thunder Bay. |
| Pardo | Nipissing. |
| Parke | Algoma. |
| Parker | Sudbury. |
| Parkin | " |
| Parkinson | Algoma. |
| Patterson | Parry Sound. |
| Pattinson | Sudbury. |
| Patton | Algoma. |
| Pattullo | Rainy River. |
| Paul | Sudbury. |
| Paxton | Nipissing. |
| Pearce | Timiskaming. |
| Pearson | Thunder Bay. |
| Peck | Nipissing. |
| Peel | Wellington. |
| Pedley | Nipissing. |
| Pelham | Welland. |
| Pelican | Kenora. |
| Pellatt | " |
| Pelletier | Algoma. |
| Pembroke | Renfrew. |
| Penharwood | Sudbury. |
| Pennefather | Algoma. |
| Pense | Timiskaming. |
| Pentland | Nipissing. |
| Percy | Northumberland. |
| Perry | Parry Sound. |
| Petawawa | Renfrew. |
| Pettypiece | Kenora. |
| Pharand | Timiskaming. |
| Phelps | Nipissing. |
| Pic | Thunder Bay. |
| Pickering | Ontario. |
| Pilkington | Wellington. |
| Pittsburgh | Frontenac. |
| Plantagenet, North | Prescott. |
| Plantagenet, South | " |
| Playfair | Timiskaming. |
| Plummer | Algoma. |
| Plympton | Lambton. |
| Poitras | Nipissing. |
| Pontiac | Timiskaming. |
| Porter | Sudbury. |
| Portland | Frontenac. |
| Potts | Rainy River. |
| Powell | Timiskaming. |
| Pratt | Rainy River. |
| Preston | Nipissing. |
| Price | Timiskaming. |
| Prince | Algoma. |
| Pringle | Parry Sound. |
| Proctor | Algoma. |
| Prosser | Timiskaming. |
| Proton | Grey. |
| Proudfoot | Parry Sound. |
| Purdom | Thunder Bay. |
| Purvis | Timiskaming. |
| Puslinch | Wellington. |
| Pyne | Timiskaming. |
| Radcliffe | Renfrew. |
| Raglan | " |
| Rainham | Haldimand. |
| Raleigh | Kent. |
| Rama | Ontario. |
| Ramsay | Sudbury. |
| Ramsay | Lanark. |
| Ramsay Wright | Rainy River. |
| Rankin | Timiskaming. |
| Rathbun | Sudbury. |
| Ratter | " |
| Rattray | Timiskaming. |
| Rawdon | Hastings. |
| Ray | Timiskaming. |
| Raymond | " |
| Raynar | Thunder Bay. |
| Rayside | Sudbury. |
| Reach | Ontario. |
| Reaume | Timiskaming. |
| Redditt | Kenora. |
| Redvers | " |
| Regan | Sudbury. |
| Reid | Timiskaming. |
| Revell | Kenora. |
| Reynolds | Timiskaming. |
| Rhodes | Sudbury. |
| Rice | Kenora. |
| Richards | Renfrew. |
| Richardson | Rainy River. |
| Richmond | Lennox. |
| Rickard | Timiskaming. |
| Riddell | Nipissing. |
| Ridout | Muskoka. |
| Ritchie | Algoma. |
| Roadhouse | Timiskaming. |
| Roberts | Sudbury. |
| Robertson | Timiskaming. |
| Robinson | Manitoulin. |
| Robillard | Timiskaming. |
| Robb | " |
| Roblin | Sudbury. |
| Roche | Algoma. |
| Rochester | Essex. |
| Roddick | Rainy River. |
| Rogers | Algoma. |
| Rolph | Renfrew. |
| Romney | Kent. |
| Rorke | Timiskaming. |
| Rose | Algoma. |
| Rosebery | Rainy River. |
| Ross | Renfrew. |
| Rowell | Kenora. |

## TOWNSHIPS IN ONTARIO—*Continued.*

| Township. | County or District. |
|---|---|
| Roxborough | Stormont. |
| Rugby | Kenora. |
| Russell | Russell. |
| Rutherford | Manitoulin. |
| Ryan | Algoma. |
| Ryde | Muskoka. |
| Ryerson | Parry Sound. |
| Sabine | Nipissing. |
| St. Edmunds | Bruce. |
| St. John | Timiskaming. |
| St. Joseph | Algoma. |
| St. Louis | Sudbury. |
| St. Mary | Algoma. |
| St. Vincent | Grey. |
| Salter | Sudbury. |
| Saltfleet | Wentworth. |
| Sandfield | Manitoulin. |
| Sandford | Kenora. |
| Sandwich, East | Essex. |
| Sandwich, South | " |
| Sandwich, West | " |
| Sankey | Algoma. |
| Sarawak | Grey. |
| Sargeant | Timiskaming. |
| Sarnia | Lambton. |
| Saugeen | Bruce. |
| Savard | Timiskaming. |
| Scadding | Sudbury. |
| Scarborough | York. |
| Scarfe | Algoma. |
| Scholes | Nipissing. |
| Scoble | Thunder Bay. |
| Scholfield | Algoma. |
| Scollard | Sudbury. |
| Scotia | " |
| Scott | Ontario. |
| Scugog | " |
| Seagram | Sudbury. |
| Sebastopol | Renfrew. |
| Secord | Sudbury. |
| Selby | " |
| Selkirk | " |
| Selwyn | Thunder Bay. |
| Semple | Sudbury. |
| Seneca | Haldimand. |
| Servos | Sudbury. |
| Seymour | Northumberland. |
| Shackleton | Timiskaming. |
| Shakespeare | Sudbury. |
| Shannon | Algoma. |
| Sharpe | Timiskaming |
| Shaw | Sudbury. |
| Shawanaga | Parry Sound. |
| Sheard | Sudbury. |
| Sheba | Timiskaming. |
| Shedden | Algoma. |
| Sheffield | Addington. |
| Sheguiandah | Manitoulin. |
| Shelburne | Sudbury. |
| Shelley | " |
| Shenango | " |
| Shenstone | Rainy River. |
| Sheppard | Sudbury. |
| Sheraton | Timiskaming. |
| Sherborne | Haliburton. |
| Sherbrooke | Haldimand. |
| Sherbrooke, North | Lanark. |
| Sherbrooke, South | " |
| Sherring | Timiskaming. |
| Sherwood | Renfrew. |
| Shetland | Algoma. |
| Shields | " |
| Shillington | Timiskaming. |
| Shuel | Algoma. |
| Sibley | Thunder Bay. |
| Sidney | Hastings. |
| Sifton | Rainy River. |
| Simpson | Algoma. |
| Sisk | Nipissing. |
| Sinclair | Muskoka. |
| Skead | Timiskaming. |
| Sladen | Sudbury. |
| Smellie | Kenora. |
| Smith | Peterborough. |
| Smyth | Timiskaming. |
| Snider | Sudbury. |
| Snowdon | Haliburton. |
| Sombra | Lambton. |
| Somerville | Victoria. |
| Sophiasburg | Prince Edward. |
| Sothman | Sudbury. |
| South Lorrain | Timiskaming. |
| Southwold | Elgin. |
| Southworth | Kenora. |
| Speight | Timiskaming. |
| Spence | Parry Sound. |
| Spohn | Rainy River. |
| Spragge | Algoma. |
| Springer | Nipissing. |
| Sproule | " |
| Stafford | Renfrew. |
| Stamford | Welland. |
| Stanhope | Haliburton. |
| Stanley | Huron. |
| Staunton | Algoma. |
| Steele | Timiskaming. |
| Stefansson | Algoma. |
| Stephen | Huron. |
| Stephenson | Muskoka. |
| Stetham | Sudbury. |
| Stewart | Nipissing. |
| Stimson | Timiskaming. |
| Stirling | Thunder Bay. |
| Stisted | Muskoka. |
| Stobie | Sudbury. |
| Stock | Timiskaming. |
| Stoddart | Algoma. |
| Storrington | Frontenac. |
| Strange | Thunder Bay. |
| Strathcona | Nipissing. |
| Strathearn | Sudbury. |
| Strathy | Nipissing. |
| Stratton | " |
| Street | Sudbury. |
| Striker | Algoma. |
| Strong | Parry Sound. |
| Studholme | Algoma. |
| Stull | Sudbury. |
| Sullivan | Grey. |
| Sulman | Timiskaming. |
| Sunnidale | Simcoe. |
| Sutherland | Rainy River. |
| Swanson | Timiskaming. |

## TOWNSHIPS IN ONTARIO—*Continued.*

| Township. | County or District. |
|---|---|
| Sweatman | Timiskaming. |
| Sweeny | Sudbury. |
| Sydenham | Grey. |
| Sydere | Timiskaming. |
| Tait | Rainy River. |
| Talbott | Algoma. |
| Tannahill | Timiskaming. |
| Tarbutt | Algoma. |
| Tarentorus | " |
| Tay | Simcoe. |
| Taylor | Timiskaming. |
| Teck | " |
| Tecumseth | Simcoe. |
| Teefy | Timiskaming. |
| Teetzel | " |
| Tehkummah | Manitoulin. |
| Telfer | Sudbury. |
| Temple | Kenora. |
| Templeton | Algoma. |
| Tennyson | " |
| Terry | Timiskaming. |
| Thackeray | " |
| Thessalon | Algoma. |
| Thistle | Nipissing. |
| Thomas | Timiskaming. |
| Thompson | Algoma. |
| Thorah | Ontario. |
| Thorburn | Timiskaming. |
| Thorneloe | " |
| Thorold | Welland. |
| Thurlow | Hastings. |
| Tilbury, North | Essex. |
| Tilbury, East | Kent. |
| Tilbury, West | Essex. |
| Tilley | Algoma. |
| Tilton | Sudbury. |
| Timmins | Timiskaming |
| Tiny | Simcoe. |
| Tisdale | Timiskaming. |
| Togo | Sudbury. |
| Tolstoi | Timiskaming. |
| Torbolton | Carleton. |
| Toronto | Peel. |
| Toronto Gore | " |
| Torrance | Sudbury. |
| Torrington | Nipissing. |
| Tosorontio | Simcoe. |
| Totten | Sudbury. |
| Tovell | Rainy River. |
| Townsend | Norfolk. |
| Trafalgar | Halton. |
| Trethewey | Timiskaming |
| Trill | Sudbury. |
| Truax | Timiskaming. |
| Tucker | Sudbury. |
| Tuckersmith | Huron. |
| Tudhope | Timiskaming. |
| Tudor | Hastings. |
| Tully | Timiskaming. |
| Tupper | Algoma. |
| Turnberry | Huron. |
| Turnbull | Timiskaming |
| Turner | Sudbury. |
| Tuscarora | Brant. |
| Tyendinaga | Hastings. |
| Tyrrell | Timiskaming |
| Umbach | Kenora. |
| Unwin | Sudbury. |
| Upsala | Thunder Bay. |
| Usborne | Huron. |
| Uxbridge | Ontario. |
| Valin | Sudbury. |
| Van Hise | Timiskaming. |
| Van Horne | Kenora. |
| Van Nostrand | Timiskaming. |
| Vankoughnet | Algoma. |
| Vaughan | York. |
| Vernon | Sudbury. |
| Verulam | Victoria. |
| Vespra | Simcoe. |
| Victoria | Algoma. |
| Vogt | Nipissing. |
| Vrooman | Sudbury. |
| Wabigoon | Kenora. |
| Wainfleet | Welland. |
| Wainwright | Kenora. |
| Waldie | Sudbury. |
| Walker | Timiskaming. |
| Wallace | Perth. |
| Wallbridge | Parry Sound. |
| Wallis | Timiskaming. |
| Walpole | Haldimand. |
| Walsingham, North | Norfolk. |
| Walsingham, South | " |
| Warden | Timiskaming. |
| Ware | Thunder Bay |
| Wark | Timiskaming. |
| Warwick | Lambton. |
| Waterloo | Waterloo. |
| Waters | Sudbury. |
| Watt | Muskoka. |
| Watten | Rainy River. |
| Wauchope | Kenora. |
| Wawanosh, East | Huron. |
| Wawanosh, West | " |
| Way | Algoma. |
| Wellesley | Waterloo. |
| Wells | Algoma. |
| Wesley | Timiskaming. |
| Westbrook | Sudbury. |
| Whalen | " |
| Westmeath | Renfrew. |
| Westminster | Middlesex. |
| Whitby | Ontario. |
| Whitby, East | " |
| Whitchurch | York. |
| White | Nipissing |
| Whiteslides | Timiskaming |
| Whitman | Algoma. |
| Whitney | Timiskaming |
| Whitson | " |
| Wicklow | Hastings |
| Widdifield | Nipissing |
| Wigle | Sudbury |
| Wilberforce | Renfrew. |
| Wilhelmina | Timiskaming |
| Wilkes | Nipissing |
| Wilkie | Timiskaming |
| Willet | " |
| Williams, East | Middlesex |
| Williams, North | Timiskaming |
| Williams, West | Middlesex |
| Williamsburgh | Dundas. |
| Williamson | Timiskaming |

## TOWNSHIPS IN ONTARIO—*Concluded.*

| Township. | County or District. |
|---|---|
| Willison | Timiskaming. |
| Willoughby | Welland. |
| Wilmot | Waterloo. |
| Wilson | Parry Sound. |
| Winchester | Dundas. |
| Windham | Norfolk. |
| Wisner | Sudbury. |
| Wolfe Island | Frontenac. |
| Wolford | Grenville. |
| Wollaston | Hastings. |
| Wood | Muskoka. |
| Woodhouse | Norfolk. |
| Woodyatt | Rainy River. |
| Woolrich | Algoma. |
| Woolwich | Waterloo. |
| Worthington | Rainy River. |
| Wylie | Renfrew. |
| Wyse | Nipissing. |
| Yarmouth | Elgin. |
| Yarrow | Timiskaming. |
| Yates | Nipissing. |
| Yonge | Leeds. |
| York | York. |
| Zavitz | Sudbury. |
| Zealand | Kenora. |
| Zone | Kent. |
| Zora, East | Oxford. |
| Zora, West | " |

## TOWNSHIPS IN QUEBEC.

| | |
|---|---|
| Abercrombie | Terrebonne. |
| Aberdeen | Pontiac. |
| Aberford | Pontiac and Timiskaming. |
| Achintre | Champlain and St. Maurice. |
| Acton | Bagot. |
| Adams | Champlain. |
| Addington | Labelle. |
| Adhémar | Pontiac. |
| Adstock | Frontenac. |
| Alguebelle | Timiskaming. |
| Albanel | Lake St. John. |
| Albani | Champlain. |
| Albert | Saguenay. |
| Aldfield | Pontiac. |
| Allard | St. Maurice. |
| Alleyn | Pontiac. |
| Allumettes | " |
| Alton | Portneuf. |
| Amherst | Labelle and Terrebonne. |
| Amyot | Champlain. |
| Angers | Bonaventure. |
| Angoulême | Maskinongé. |
| Arago | L'Islet. |
| Archambault | Montcalm. |
| Armagh | Bellechasse and Montmagny. |
| Armand | Témiscouata. |
| Arnaud | Saguenay. |
| Arthabaska | Arthabaska and Megantic. |
| Arundel | Argenteuil. |
| Ascot | Sherbrooke. |
| Ashburton | Montmagny. |
| Ashford | L'Islet. |
| Ashford, Aug | " |
| Ashuapmouchouan | Lake St. John. |
| Assemetquagan | Bonaventure. |
| Aston | Nicolet. |
| Aston Gore | " |
| Atwater | Timiskaming. |
| Aubin | Champlain. |
| Auckland | Compton. |
| Auclair | Témiscouata. |
| Auger | Pontiac. |
| Aumond | Ottawa. |
| Awantjish | Matane. |
| Aylmer | Frontenac. |
| Aylwin | Ottawa. |
| Babel | Saguenay. |
| Baby | Timiskaming. |
| Bagot | Chicoutimi. |
| Baillargé | Lake St. John. |
| Baillargeon | Gaspe. |
| Bardy | Champlain. |
| Barford | Stanstead. |
| Baril | Champlain. |
| Barnston | Stanstead. |
| Barraute | Timiskaming. |
| Barry | Pontiac. |
| Bartouille | Timiskaming. |
| Baskatong | Ottawa. |
| Basserode | Timiskaming. |
| Baudin | Pontiac and Berthier. |
| Baune | Saguenay. |
| Bauneville | Timiskaming. |
| Bazin | Champlain and St. Maurice. |
| Béarn | Timiskaming. |
| Beaubien | L'Islet. |
| Beaumesnil | Timiskaming. |
| Bédard | Rimouski. |
| Bégin | Chicoutimi. |
| Bégon | Témiscouata. |
| Bellecourt | Saguenay. |
| Belleau | St. Maurice. |
| Bellechasse | Bellechasse. |
| Bellecombe | Timiskaming. |
| Béraud | " |
| Beresford | Terrebonne. |
| Bergeronnes | Saguenay. |
| Bernetz | Timiskaming. |
| Bernier | Pontiac. |
| Berlinguet | Champlain and Lake St. John. |
| Berry | Timiskaming. |
| Bersimis | Saguenay. |
| Berthelot | Pontiac. |
| Biart | Quebec. |
| Bickerdike | " |
| Biencourt | Rimouski. |
| Bigelow | Labelle. |
| Bisaillon | Champlain. |

## TOWNSHIPS IN QUEBEC—*Continued.*

| Township. | County or District. |
|---|---|
| Bissot | Saguenay. |
| Blaiklock | Abitibi. |
| Blais | Matane. |
| Blake | Labelle and Ottawa. |
| Blanche | Saguenay. |
| Blanchet | Gaspe. |
| Blanc-Sablon (archipelago) | Saguenay. |
| Blandford | Arthabaska and Nicolet. |
| Boilleau | Chicoutimi. |
| Bois | Portneuf. |
| Boischatel | Timiskaming. |
| Boisclair | " |
| Boishébert | Saguenay. |
| Boisseau | Pontiac. |
| Bolton | Brome. |
| Bongard | Pontiac. |
| Bonin | Champlain and Lake St. John. |
| Bonne-Espérance | Saguenay. |
| Booth | Timiskaming. |
| Borgia | Quebec. |
| Botsford | Témiscouata. |
| Boucher | Champlain. |
| Bouchette | Ottawa. |
| Bougainville | Saguenay. |
| Bourassa | Champlain. |
| Bourdages | Montmagny. |
| Bourdon | Saguenay. |
| Bourgeois | Champlain. |
| Bourget | Chicoutimi. |
| Bourlamaque | Timiskaming. |
| Bourmont | Berthier and Pontiac. |
| Bousquet | Timiskaming. |
| Bouthillier | Labelle. |
| Bowman | Labelle. |
| Boyer | " |
| Brandon | Berthier and Joliette. |
| Brassard | Berthier. |
| Brassier | Pontiac. |
| Brébeuf | Chicoutimi. |
| Brecourt | Pontiac and St. Maurice. |
| Brest | Saguenay. |
| Bristol | Pontiac. |
| Brochu | Champlain. |
| Brodeur | Timiskaming. |
| Brome | Brome. |
| Brompton | Richmond. |
| Bronague | Saguenay. |
| Broughton | Beauce. |
| Bruchési | Timiskaming. |
| Bryson | Pontiac. |
| Buckingham | Labelle. |
| Buckland | Bellechasse and Dorchester |
| Bules | Maskinongé and St. Maurice. |
| Bulstrode | Arthabaska. |
| Bungay | Kamouraska. |
| Bureau | Champlain. |
| Bury | Compton. |
| Cabano | Témiscouata. |
| Cabot | Matane. |
| Cadieux | Champlain |
| Cadillac | Timiskaming. |
| Caire | " |
| Callières | Charlevoix. |
| Calumet | Pontiac. |
| Cameron | Ottawa. |
| Campbell | Labelle. |
| Campeau | Timiskaming. |
| Cannon | Saguenay. |
| Cap-Chat | Gaspe. |
| Cap-Rosier | " |
| Carignan | Champlain. |
| Carleton | Bonaventure. |
| Caron | Lake St. John. |
| Carpentier | Timiskaming. |
| Cartier | Joliette. |
| Casault | Matane. |
| Casgrain | L'Islet. |
| Castagnier | Timiskaming. |
| Causapscal | Matane. |
| Cathcart | Joliette. |
| Cauchon | Montmorency. |
| Cawood | Pontiac. |
| Caxton | St. Maurice. |
| Céry | Saguenay. |
| Chabert | Timiskaming |
| Chabot | Kamouraska. |
| Champigny | Chicoutimi. |
| Chapais | Kamouraska. |
| Chapleau | Maskinongé. |
| Chapman | Champlain. |
| Chardon | Chicoutimi |
| Charest | Champlain. |
| Charette | Pontiac. |
| Charlevoix | Lake St. John. |
| Charnay | Saguenay. |
| Chassaigne | Maskinongé, Pontiac and St. Maurice |
| Chasseur | Quebec. |
| Chateauvert | Champlain |
| Chatham | Argenteuil |
| Chaumont | Quebec. |
| Chauveau | Charlevoix. |
| Chauvin | Chicoutimi. |
| Chavigny | Portneuf |
| Chazel | Timiskaming |
| Chenier | Rimouski |
| Cherbourg | Matane. |
| Cherrier | Pontiac |
| Chertsey | Montcalm |
| Chesham | Frontenac |
| Chester | Arthabaska |
| Chevalier | Saguenay |
| Chichester | Pontiac |
| Chicoutimi | Chicoutimi |
| Chilton | Montcalm |
| Chonimard | Champlain |
| Choquette | Maskinongé and St. Maurice |
| Christie | Gaspe. |
| Cimon | Chicoutimi |
| Clapham | Pontiac |
| Clarendon | " |
| Clerley | Timiskaming |

## TOWNSHIPS IN QUEBEC—*Continued.*

| Township. | County or District. |
|---|---|
| Clerion | Timiskaming. |
| Clermont | " |
| Cleveland | Richmond. |
| Clifton | Compton. |
| Clinton | Frontenac. |
| Cloridorme | Gaspe. |
| Closse | Pontiac. |
| Cloutier | Champlain. |
| Clyde | Labelle. |
| Coigny | Timiskaming. |
| Colbert | Portneuf. |
| Coleraine | Megantic. |
| Compton | Compton. |
| Cook | Saguenay. |
| Coquart | Chicoutimi. |
| Couillard | " |
| Courcelles | Berthier. |
| Coursol | Pontiac. |
| Couture | Chicoutimi. |
| Courville | Timiskaming. |
| Cox | Bonaventure. |
| Cranbourne | Dorchester. |
| Crémazie | Champlain. |
| Crespieul | Lake St. John. |
| Crusson | Pontiac. |
| Cuvillier | " |
| Daaquam | Bellechasse. |
| Dablon | Lake St. John. |
| Dalibaire | Matane. |
| Dalmas | Lake St. John. |
| Dalquier | Timiskaming. |
| Dandurand | Champlain and St. Maurice. |
| Dansereau | Champlain. |
| Darlens | Timiskaming. |
| Dasserat | " |
| Daudhébourg | Saguenay. |
| David | Maskinongé and St. Maurice. |
| De Beaujeu | Gaspe. |
| De Calonnes | Maskinongé. |
| De Cazes | Lake St. John. |
| Decelles | Champlain. |
| Dechene | Lake St. John. |
| Delâge | Champlain. |
| Delbreuil | Timiskaming. |
| Delisle | Lake St. John. |
| De Maisonneuve | Berthier. |
| Demers | Témiscouata. |
| Demeules | Lake St. John. |
| De Monts | Saguenay. |
| Denholm | Ottawa. |
| Denonville | Témiscouata. |
| Denoue | Gaspe. |
| Dequen | Lake St. John. |
| Derry | Labelle. |
| De Salaberry | Terrebonne. |
| De Sales | Charlevoix. |
| Desandroins | Timiskaming. |
| Desaulniers | St. Maurice. |
| Desboues | Timiskaming. |
| Deschamps | Pontiac. |
| Desmeloizes | Timiskaming. |
| Despinassy | " |
| Desroberts | " |
| Dessane | Champlain. |
| Destor | Timiskaming. |
| Devlin | " |
| Déziel | Champlain. |
| Dionne | L'Islet. |
| Disson | Timiskaming. |
| Ditchfield | Frontenac. |
| Ditton | Compton. |
| Dolbeau | Lake St. John. |
| Dollard | Pontiac. |
| Doncaster | Terrebonne. |
| Dorion | Pontiac. |
| Dorset | Frontenac. |
| Douglas | Gaspe. |
| Doussin | Pontiac. |
| Douville | Maskinongé and St. Maurice. |
| Drouin | Champlain. |
| Duberger | Lake St. John and Mistassini. |
| Dubois | Champlain and Lake St. John. |
| Dubuc | Chicoutimi. |
| Dubuisson | Timiskaming. |
| Duchesnay | Gaspe. |
| Duchesneau | Saguenay. |
| Ducreux | Chicoutimi. |
| Ducros | Timiskaming. |
| Dudley | Labelle. |
| Dudswell | Wolfe. |
| Dufay | Timiskaming. |
| Dufferin | Lake St. John. |
| Dufresnoy | Timiskaming. |
| Duhamel | " |
| Dumas | Chicoutimi. |
| Dumoulin | Champlain. |
| Dundee | Huntingdon. |
| Dunham | Missisquoi. |
| Duparquet | Timiskaming. |
| Duprat | " |
| Dupuis | Champlain. |
| Duquesne | Rimouski. |
| Durham | Drummond. |
| Durocher | Chicoutimi. |
| Duval | Saguenay. |
| Duverny | Timiskaming. |
| Eardley | Ottawa. |
| Eaton | Compton. |
| Eddy | Timiskaming. |
| Edwards | " |
| Egan | Ottawa. |
| Elgin | Huntingdon. |
| Ely | Shefford. |
| Emberton | Compton. |
| Escoumains | Saguenay. |
| Esher | Pontiac. |
| Estcourt | Témiscouata. |
| Evanturel | Champlain. |
| Fabre | Timiskaming. |
| Faguy | Champlain and Lake St. John. |
| Faillon | Pontiac. |
| Falardeau | Chicoutimi. |
| Farnham | Brome and Missisquoi |

## TOWNSHIPS IN QUEBEC—*Continued.*

| Township. | County or District. |
|---|---|
| Faucher | Champlain and St. Maurice. |
| Ferland | Chicoutimi. |
| Fiedmont | Timiskaming. |
| Figuery | " |
| Fitzpatrick | Saguenay. |
| Flahault | Bonaventure. |
| Fleuriault | Matane and Rimouski. |
| Flynn | Rimouski. |
| Forsyth | Frontenac. |
| Fortier | Maskinongé and St. Maurice. |
| Fortin | Gaspe. |
| Fournier | L'Islet. |
| Fournière | Timiskaming. |
| Fox | Gaspe. |
| Frampton | Dorchester. |
| Franklin | Huntingdon. |
| Franquelin | Saguenay. |
| Frechette | Champlain. |
| Frémont | " |
| Gaboury | Timiskaming. |
| Gagné | Chicoutimi. |
| Gagnon | Labelle. |
| Galt | Gaspe. |
| Garneau | L'Islet. |
| Garnier | Lake St. John. |
| Garthby | Wolfe. |
| Gaspe Bay, North | Gaspe. |
| Gaspe Bay, South | " |
| Gauthier | Berthier. |
| Gauvin | Lake St. John and Mistassini. |
| Gayhurst | Frontenac. |
| Gendreau | Timiskaming. |
| Gendron | Quebec. |
| Geoffrion | Champlain. |
| Gillies | Pontiac. |
| Girard | Lake St. John. |
| Girouard | Pontiac. |
| Godmanchester | Huntingdon. |
| Gore | Argenteuil. |
| Gosford | Portneuf. |
| Gosselin | Berthier and Maskinonge. |
| Gouin | Joliette. |
| Goynish | Saguenay. |
| Granby | Shefford. |
| Grandison | Terrebonne. |
| Granet | Timiskaming |
| Grantham | Drummond. |
| Gravel | Labelle. |
| Grenier | Saguenay. |
| Grenville | Argenteuil. |
| Grenville, Aug | " |
| Guay | Timiskaming |
| Guérin | " |
| Guigues | " |
| Guyenne | " |
| Hackett | Champlain. |
| Halifax | Megantic. |
| Ham, North | Wolfe. |
| Ham, South | " |
| Hamel | Champlain. |
| Hamilton | Bonaventure. |
| Hampden | Compton. |
| Hanotaux | Champlain and Pontiac. |
| Harper | Champlain. |
| Harrington | Argenteuil. |
| Hartwell | Labelle. |
| Harvey | Chicoutimi. |
| Hatley | Stanstead. |
| Havelock | Huntingdon. |
| Hébécourt | Timiskaming. |
| Hébert | Chicoutimi. |
| Hemmingford | Huntingdon. |
| Hereford | Compton. |
| Hereford, Gore | " |
| Hinchinbrook | Huntingdon. |
| Hincks | Ottawa. |
| Hocquart | Témiscouata |
| Holmes | Pontiac. |
| Hope | Bonaventure. |
| Horton | Arthabaska and Nicolet. |
| Howard | Argenteuil. |
| Huard | Lake St. John |
| Huddersfield | Pontiac. |
| Huguenin | Champlain. |
| Hull | Ottawa. |
| Humqui | Matane. |
| Hunterstown | Maskinongé. |
| Huot | Champlain. |
| Iberville | Saguenay. |
| Ingall | Champlain. |
| Inverness | Megantic. |
| Ireland | " |
| Ixworth | Kamouraska. |
| Jersey | Beauce. |
| Jetté | Matane. |
| Joanne | Timiskaming. |
| Joliette | Berthier and Joliette. |
| Joly | Labelle. |
| Jonquière | Chicoutimi. |
| Josselin | Pontiac. |
| Jourdan | Timiskaming. |
| Juneau | Pontiac. |
| Jurier | " |
| Kaine | Maskinongé. |
| Kalm | Pontiac. |
| Kecarpoui (archipelago) | Saguenay. |
| Kegashka | " |
| Kenogami | Chicoutimi. |
| Kensington | Ottawa. |
| Klamika | Labelle |
| Kildare | Joliette |
| Kilkenny | Montcalm and Terrebonne. |
| Kilkenny, Gore | Montcalm |
| Kingsey | Drummond |
| Laas | Timiskaming |
| Labarre | Lake St John |
| Labelle | Labelle |
| Labrecque | Chicoutimi |
| Labrie | Pontiac |
| Labrosse | Chicoutimi |
| LaBruère | Lake St John |
| Lacasse | Champlain and Pontiac |
| LaCorne | Timiskaming |

## TOWNSHIPS IN QUEBEC—*Continued.*

| Township. | County or District. |
|---|---|
| Lacoste | Charlevoix. |
| Lafiteau | Champlain and Lake St. John. |
| Laflamme | " |
| Laflèche | Saguenay. |
| Lafontaine | L'Islet. |
| Laforce | Gaspe. |
| Lagacé | Pontiac and Champlain. |
| Lagorgendière | Saguenay. |
| Lalande | " |
| Laliberté | Champlain. |
| Lallemant | Chicoutimi. |
| Lambton | Frontenac. |
| La Minerve | Labelle. |
| Lamorandière | Timiskaming. |
| La Motte | " |
| Lamy | Champlain. |
| Landanet | Timiskaming. |
| Landrienne | " |
| Landry | Champlain and St. Maurice. |
| Langelier | Champlain. |
| Langevin | Dorchester. |
| Languedoc | Timiskaming. |
| La Pause | " |
| Lapeyrère | Champlain. |
| Lapointe | Chicoutimi. |
| Laporte | " |
| La Reine | Timiskaming. |
| Larocque | Gaspe. |
| Lartigue | Chicoutimi. |
| Lareau | Champlain. |
| Larue | Quebec. |
| Lasalle | Portneuf. |
| La Sarre | Timiskaming. |
| Laperrière | " |
| Laterrière | Chicoutimi. |
| Lathbury | Labelle. |
| Latour | Saguenay. |
| Latulipe | Timiskaming. |
| Laubanie | " |
| Launay | " |
| Laure | Quebec. |
| Laurier | Champlain. |
| Laval | Saguenay. |
| Lavallée | Champlain. |
| Laverlochère | Timiskaming. |
| Lavigne | Champlain. |
| Laviolette | Maskinongé. |
| Lavoie | Quebec. |
| Leau | Champlain and St. Maurice. |
| Leblanc | Champlain. |
| Lecomte | Pontiac. |
| Leeds | Megantic. |
| LeGardeur | Saguenay. |
| Leigne | Pontiac. |
| Lejeune | Champlain. |
| Lemay | " |
| Lemoine | Abitibi. |
| Leneuf | Saguenay. |
| Lepage | Matane. |
| Lesage | Labelle. |
| Lescarbot | Quebec. |
| Leslie | Pontiac. |
| Lessard | L'Islet. |
| Lestres | Pontiac. |
| Letellier | Saguenay. |
| Letondal | Champlain. |
| Levasseur | " |
| Leverrier | L'Islet. |
| Liénard | Saguenay. |
| Ligneris | Timiskaming. |
| Lindsay | Champlain and Lake St. John. |
| Lingwick | Compton. |
| Linière | Beauce. |
| Litchfield | Pontiac. |
| Livernois | Champlain. |
| Lochaber | Labelle. |
| Lochaber, Gore | " |
| Logan | Pontiac. |
| Loranger | Labelle. |
| Lortie | Champlain. |
| Louise | Frontenac. |
| Louvicourt | Timiskaming. |
| Low | Ottawa. |
| Lussier | Montcalm. |
| Lynch | Labelle and Montcalm. |
| Lytton | Ottawa. |
| McCorkill | Abitibi, Lake St. John and Mistassini. |
| McGill | Labelle. |
| McKenzie | Abitibi. |
| McLachlin | Timiskaming. |
| McNider | Matane. |
| Macpès | Rimouski. |
| McSweeny | Champlain. |
| Maddington | Arthabaska and Nicolet. |
| Magnan | Champlain. |
| Magog | Stanstead. |
| Mailloux | Bellechasse. |
| Major | Labelle. |
| Malakoff | Pontiac. |
| Malartic | Timiskaming. |
| Malbaie | Gaspe. |
| Malherbe | Lake St. John. |
| Malhiot | Champlain. |
| Manikuagan | Saguenay. |
| Maniwaki | Ottawa. |
| Mann | Bonaventure. |
| Manneville | Timiskaming. |
| Mansfield | Pontiac. |
| Marchand | Labelle. |
| Maria | Bonaventure. |
| Maricourt | Pontiac. |
| Marlow | Frontenac. |
| Marmette | Champlain. |
| Marmier | Portneuf. |
| Marquette | Lake St. John. |
| Marrias | Timiskaming. |
| Marsal | Saguenay. |
| Marston | Frontenac. |
| Martin | Pontiac. |
| Masham | Ottawa. |
| Massé | Matane and Rimouski. |
| Masson | Maskinonge. |
| Matalik | Matane. |
| Matane | " |

## TOWNSHIPS IN QUEBEC—*Continued.*

| Township. | County or District. |
|---|---|
| Matapedia | Bonaventure. |
| Mathieu | Champlain. |
| Mazenod | Timiskaming. |
| Mazerac | " |
| Mazères | Pontiac. |
| Meilleur | Lake St. John. |
| Mekattina, Petit (archipelago) | Saguenay. |
| Mekattina, Gros (archipelago) | " |
| Mekinak | Champlain. |
| Melbourne | Richmond. |
| Mercier | Timiskaming. |
| Mesplets | Pontiac. |
| Mésy | Lake St. John. |
| Metabetchouan | " |
| Métgermette, North | Beauce. |
| Metgermette, South | " |
| Michaux | Quebec. |
| Milnikek | Bonaventure. |
| Milton | Shefford. |
| Milton, Gore | " |
| Miniac | Timiskaming. |
| Moisie | Saguenay. |
| Montagne | Timiskaming. |
| Montanier | " |
| Montauban | Portneuf. |
| Montbeillard | Timiskaming. |
| Montbray | " |
| Montcalm | Argenteuil. |
| Montesson | Saguenay. |
| Montgay | Timiskaming. |
| Montigny | Labelle. |
| Mont Louis | Gaspe. |
| Montminy | Montmagny. |
| Montpetit | Champlain and St. Maurice. |
| Monureuil | Timiskaming. |
| Moquin | Pontiac. |
| Moreau | Labelle. |
| Morin | Argenteuil and Terrebonne. |
| Mortague | Timiskaming. |
| Mousseau | Labelle and Montcalm. |
| Mulgrave | Labelle. |
| Muskwaro | Saguenay. |
| Myrand | Champlain. |
| Natashkwan | Saguenay. |
| Nantel | Montcalm. |
| Nedelec | Timiskaming. |
| Neigette | Rimouski. |
| Nellson | Quebec. |
| Nelson | Megantic. |
| Nemtaye | Matane. |
| Nevers | Champlain. |
| Newport | Gaspe. |
| Newport | Compton. |
| New Richmond | Bonaventure. |
| Newton | Vaudreuil. |
| Noiseaux | Pontiac. |
| Normand | Champlain. |
| Normandin | Lake St John |
| Northfield | Ottawa. |
| Nouvelle | Bonaventure |
| Obalski | Abitibi. |
| Olscamps | Champlain. |
| Onslow | Pontiac. |
| Orford | Sherbrooke. |
| O'Sullivan | Mistassini. |
| Otis | Chicoutimi. |
| Ouapitagone (archipelago) | Saguenay. |
| Ouiatchouan | Lake St. John. |
| Ouimet | Rimouski. |
| Packington | Témiscouata. |
| Painchaud | Kamouraska. |
| Palmarolle | Timiskaming. |
| Panet | Montmagny. |
| Papin | Quebec. |
| Papineau | Labelle . |
| Parent | Lake St. John. |
| Parke | Kamouraska. |
| Pascalis | Timiskaming. |
| Patapedia | Bonaventure. |
| Patton | Montmagny. |
| Payment | Champlain. |
| Pelissier | Timiskaming. |
| Pelletier | Lake St. John. |
| Percé | Gaspe. |
| Périgny | Chicoutimi. |
| Perrault | Quebec. |
| Perrier | Champlain and Pontiac. |
| Peterborough | Berthier and Maskinonge. |
| Petit | Lake St. John. |
| Peuvret | Saguenay. |
| Phelyppeaux | " |
| Picard | Champlain |
| Pinault | Matane. |
| Plessis | Chicoutimi. |
| Pohenegamook | Kamouraska. |
| Poisson | Champlain, Pontiac and St. Maurice |
| Polette | Champlain. |
| Ponsonby | Labelle. |
| Pontbriand | Lake St. John. |
| Pontefract | Pontiac. |
| Pontchartrain | Saguenay. |
| Pontgravé | " |
| Pontleroy | Timiskaming |
| Pope | Labelle. |
| Port Daniel | Bonaventure |
| Portland | Labelle. |
| Portneuf | Saguenay. |
| Pothier | Champlain |
| Potton | Brome. |
| Poularies | Timiskaming |
| Preissac | " |
| Preston | Labelle |
| Price | Frontenac |
| Privat | Timiskaming |
| Provencher | Champlain and St Maurice |
| Provost | Berthier. |
| Racine | Lake St. John |
| Radnor | Champlain |
| Raffeix | Saguenay |
| Raguneau | " |
| Rameau | Gaspe |
| Randet | Temiscouata |
| Rawdon | Montcalm |
| Remigny | Timiskaming |
| Rhéaume | Champlain |

## TOWNSHIPS IN QUEBEC—*Continued.*

| Township. | County or District. |
|---|---|
| Rhodes | Montmorency and Quebec. |
| Richardson | Abitibi and Mistassini. |
| Ripon | Labelle. |
| Risborough | Frontenac. |
| Ristigouche | Bonaventure. |
| Rivard | Labelle. |
| Robertson | " |
| Roberval | Lake St. John. |
| Robidoux | Bonaventure. |
| Robin | Pontiac. |
| Robinson | Témiscouata. |
| Robitaille | " |
| Rocheblave | Labelle. |
| Rochebeaucourt | Timiskaming. |
| Rochemonteix | Saguenay. |
| Rochon | Labelle. |
| Rocmont | Portneuf. |
| Rolette | Montmagny. |
| Rolland | Montcalm. |
| Romieu | Matane. |
| Roquemaure | Timiskaming. |
| Ross | Lake St. John. |
| Roubaud | Timiskaming. |
| Rouillard | Témiscouata. |
| Routhier | Champlain and Lake St. John. |
| Roux | Bellechasse. |
| Rouyn | Timiskaming. |
| Roxton | Shefford. |
| Roy | Abitibi and Mistassini. |
| Royal-Roussillon | Timiskaming. |
| Royer | Saguenay. |
| Sabourin | Timiskaming. |
| Sagard | Saguenay. |
| Saguenay | " |
| St. Augustin (archipelago) | " |
| St. Camille | Wolfe. |
| St. Denis | Matane. |
| St. Germain | Chicoutimi. |
| St. Hilaire | Lake St. John. |
| St. Jean | Chicoutimi. |
| Ste. Marie (archipelago) | Saguenay. |
| St. Maurice | St. Maurice. |
| Saint-Père | Pontiac. |
| St. Vincent | Saguenay. |
| Scott | Abitibi. |
| Senneterre | Pontiac and Timiskaming. |
| Senneville | Timiskaming. |
| Sérigny | Pontiac. |
| Settrington | Charlevoix. |
| Shawenegan | St. Maurice. |
| Sheen | Pontiac. |
| Shefford | Shefford. |
| Shehyn | Timiskaming. |
| Shenley | Beauce. |
| Sherrington | Napierville. |
| Shipton | Richmond. |
| Sicotte | Ottawa. |
| Signai | Lake St. John. |
| Silvy | Chicoutimi. |
| Simard | " |
| Simpson | Arthabaska and Drummond. |
| Sincennes | Champlain. |
| Somerset | Megantic. |
| Spalding | Frontenac. |
| Squart | Pontiac. |
| Stanbridge | Missisquoi. |
| Standon | Dorchester. |
| Stanfold | Arthabaska. |
| Stanstead | Stanstead. |
| Stoke | Richmond. |
| Stoneham | Quebec. |
| Stratford | Wolfe. |
| Stukely | Shefford. |
| Suffolk | Labelle. |
| Sulte | Champlain. |
| Surimau | Timiskaming. |
| Sutton | Brome. |
| Sydenham North | Gaspe. |
| Sydenham South | " |
| Suzor | Champlain. |
| Tabaret | Timiskaming. |
| Taché | Chicoutimi. |
| Tadoussac | Saguenay. |
| Taillon | Lake St. John. |
| Talon | Montmagny. |
| Tanguay | Lake St. John. |
| Tarte | Champlain. |
| Taschereau | Gaspe. |
| Tassé | Champlain. |
| Tavernier | Pontiac. |
| Tellier | Joliette. |
| Templeton | Ottawa. |
| Tessier | Matane. |
| Tewkesbury | Quebec. |
| Thetford | Megantic. |
| Thorne | Pontiac. |
| Tillemont | " |
| Tingwick | Arthabaska. |
| Tonnancour | Pontiac. |
| Tonti | Portneuf. |
| Tourelle | Gaspe. |
| Tourouvre | Champlain. |
| Toussaint | " |
| Tracy | Joliette. |
| Trécesson | Timiskaming. |
| Tremblay | Chicoutimi. |
| Trévet | Pontiac. |
| Tring | Beauce. |
| Trudel | Quebec. |
| Turcotte | Champlain. |
| Turgeon | Labelle. |
| Upton | Bagot, Drummond and Yamaska. |
| Valets | Pontiac. |
| Vallières | Champlain. |
| Valmy | Pontiac. |
| Varsan | Timiskaming. |
| Vassal | " |
| Vasson | Pontiac. |
| Vaudray | Timiskaming. |
| Vauquelin | Pontiac. |
| Verreau | Champlain and Lake St. John. |
| Vieux Fort (archipelago) | Saguenay. |
| Viger | Témiscouata. |
| Vilars | Timiskaming. |
| Villemontel | " |

## TOWNSHIPS IN QUEBEC—*Concluded.*

| Township. | Country or District. |
|---|---|
| Villeneuve | Labelle. |
| Wabassee | " |
| Wakefield | Ottawa. |
| Waltham | Pontiac. |
| Ware | Bellechasse and Dorchester. |
| Warwick | Arthabaska. |
| Washicoutai (archipelago) | Saguenay. |
| Watford | Dorchester. |
| Weedon | Wolfe. |
| Weir | Bonaventure. |
| Wells | Labelle. |
| Wendover | Drummond and Nicolet. |
| Wendover, Gore | Yamaska. |
| Wentworth | Argenteuil. |
| Westbury | Compton. |
| Wexford | Montcalm and Terrebonne. |
| Weymontachingue | Champlain. |
| Whitton | Frontenac. |
| Whitton, Gore | " |
| Whitworth | Témiscouata. |
| Wickham | Drummond. |
| Windsor | Richmond. |
| Winslow | Frontenac. |
| Woburn | " |
| Wolfe | Terrebonne. |
| Wolfestown | Wolfe. |
| Woodbridge | Kamouraska. |
| Wotton | Wolfe. |
| Wright | Ottawa. |
| Wurtele | Labelle. |
| York | Gaspe. |

## TOWNSHIPS IN NOVA SCOTIA.

| Township. | County |
|---|---|
| Amherst | Cumberland. |
| Annapolis | Annapolis. |
| Argyle | Yarmouth. |
| Arisaig | Antigonish. |
| Aylesford | Kings. |
| Barrington | Shelburne. |
| Boulardarie (island) | Cape Breton. |
| Chester | Lunenburg. |
| Clare | Digby. |
| Clements | Annapolis. |
| Cornwallis | Kings. |
| Dartmouth | Halifax. |
| Digby | Digby. |
| Digby Neck | " |
| Dorchester | Antigonish. |
| Douglas | Hants. |
| Economy | Colchester. |
| Egerton | Pictou. |
| Falmouth | Hants. |
| Granville | Annapolis. |
| Guysborough | Guysborough. |
| Guysborough | Queens. |
| Horton | Kings. |
| Halifax | Halifax. |
| Hillsborough | Digby. |
| Kempt | Hants. |
| Kemptown | Colchester. |
| Liverpool | Queens. |
| Londonderry | Colchester. |
| Long Island | Digby. |
| Lunenburg | Lunenburg. |
| Louisburg | Cape Breton. |
| Maitland | Hants. |
| Manchester | Guysborough |
| Maxwellton | Pictou. |
| Milford | Guysborough. |
| Mira | Cape Breton. |
| Morristown | Antigonish. |
| New Dublin | Lunenburg. |
| Newport | Hants. |
| Oldham | Halifax. |
| Onslow | Colchester. |
| Pictou | Pictou. |
| Preston | Halifax. |
| Rawdon | Hants. |
| Sackville | Halifax. |
| St. Andrews | Antigonish. |
| St. Andrews | Cape Breton. |
| St. Josephs | Antigonish. |
| St. Marys | Guysborough. |
| Shelburne | Shelburne. |
| Shubenacadie | Hants. |
| Stewiacke | Colchester |
| Stirling | " |
| Stormont | Guysborough |
| Sydney | Cape Breton |
| Tangier | Halifax |
| Tatamagouche | Colchester |
| Tracadie | Antigonish |
| Truro | Colchester |
| Uniacke | Hants |
| Walton | " |
| Wilmot | Annapolis |
| Wilmot | Guysborough |
| Windsor | Hants |
| Weymouth | Digby |
| Yarmouth | Yarmouth |

## PARISHES IN NEW BRUNSWICK.

| Parish. | County. |
|---|---|
| Aberdeen | Carleton. |
| Acadieville | Kent. |
| Addington | Restigouche. |
| Alma | Albert. |
| Alnwick | Northumberland. |
| Andover | Victoria. |
| Balmoral | Restigouche. |
| Bathurst | Gloucester. |
| Beresford | " |
| Blackville | Northumberland. |
| Blissfield | Northumberland. |
| Blissville | Sunbury. |
| Botsford | Westmorland. |
| Bright | York. |
| Brighton | Carleton. |
| Brunswick | Queens. |
| Burton | Sunbury. |
| Cambridge | Queens. |
| Campobello | Charlotte. |
| Canning | " |
| Canterbury | York. |
| Caraquet | Gloucester. |
| Cardwell | Kings. |
| Carleton | Kent. |
| Chatham | Northumberland. |
| Chipman | Queens. |
| Clarendon | Charlotte. |
| Clair | Victoria. |
| Cloverdale | Albert. |
| Colborne | Restigouche. |
| Dalhousie | " |
| Derby | Northumberland. |
| Dorchester | Westmorland. |
| Douglas | York. |
| Drummond | Victoria. |
| Dufferin | Charlotte. |
| Dumbarton | " |
| Dumfries | York. |
| Dundas | Kent. |
| Durham | Restigouche. |
| Eldon | " |
| Elgin | Albert. |
| Gagetown | Queens. |
| Gladstone | Sunbury. |
| Glenelg | Northumberland. |
| Gordon | Victoria. |
| Grand Falls | " |
| Grand Manan | Charlotte. |
| Greenwich | Kings. |
| Hammond | " |
| Hampstead | Queens. |
| Hampton | Kings. |
| Hartcourt | Kent. |
| Hardwicke | Northumberland. |
| Harvey | Albert. |
| Havelock | Kings. |
| Hillsborough | Albert. |
| Hopewell | " |
| Huskisson | Kent. |
| Inkerman | Gloucester. |
| Johnston | Queens. |
| Kars | Kings. |
| Kent | Carleton. |
| Kingsclear | York. |
| Kingston | Kings. |
| Lancaster | St. John. |
| Lepreau | Charlotte. |
| Lincoln | Sunbury. |
| Lorne | Victoria. |
| Ludlow | Northumberland. |
| McAdam | York. |
| Madawaska | Madawaska. |
| Manners Sutton | York. |
| Maugersville | Sunbury. |
| Moncton | Westmorland. |
| Musquash | St. John. |
| Nelson | Northumberland. |
| New Bandon | Gloucester. |
| Newcastle | Northumberland. |
| New Maryland | York. |
| Northampton | Carleton. |
| Northesk | Northumberland. |
| Northfield | Sunbury. |
| North Lake | York. |
| Norton | Kings. |
| Paquetville | Gloucester. |
| Peel | Carleton. |
| Penfield | Charlotte. |
| Perth | Victoria. |
| Petersville | Queens. |
| Prince William | York. |
| Queensbury | " |
| Richibucto | Kent. |
| Richmond | Carleton. |
| Rogersville | Northumberland. |
| Rothesay | Kings. |
| Sackville | Westmorland. |
| St. Andrews | Charlotte. |
| St. Anns | Madawaska. |
| St. Basil | " |
| St. Croix | Charlotte. |
| St. David | " |
| St. Francis | Madawaska. |
| St. George | Charlotte. |
| St. Hilaire | Madawaska. |
| St. Isidore | Gloucester. |
| St. Jacques | Madawaska. |
| St. James | Charlotte. |
| St. Leonard | Madawaska. |
| St. Louis | Kent. |
| St. Martins | St. John. |
| St. Mary | Kent. |
| St. Marys | York. |
| St. Patrick | Charlotte. |
| St. Paul | Kent. |
| St. Stephen | Charlotte. |
| Salisbury | Westmorland. |
| Saumarez | Gloucester. |
| Shediac | Westmorland. |
| Sheffield | Sunbury. |
| Shippigan | Gloucester. |
| Simonds | Carleton. |
| Simonds | St. John. |
| Southampton | York. |

## PARISHES IN NEW BRUNSWICK—*Concluded.*

| Parish. | County. | Parish. | County. |
|---|---|---|---|
| Southesk | Northumberland. | Weldford | Kent. |
| Springfield | Kings. | Wellington | " |
| Stanley | York. | Westfield | Kings. |
| Studholm | Kings. | West Isles | Charlotte. |
| Sussex | " | Westmorland | Westmorland. |
| Upham | " | Wickham | Queens. |
| Wakefield | Carleton. | Wicklow | Carleton. |
| Waterboro | Queens. | Wilmot | " |
| Waterford | Kings. | Woodstock | " |