REPORT

OF THE

CANADIAN PACIFIC RAILWAY

ROYAL COMMISSION

VOLUME III

CONCLUSIONS

OTTAWA

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ERRATA.

VOLUME I.

Page 193, question 2,921, in answer, instead of "can" read "cannot."
" 194, " 2,929, " " "harbour" read "hardware."
" 713, " 10,964, " " "there was any material" read "there was not any material."
" 918, question 13,493, in answer, instead of "Gorman" read "Fairman."
" 918, " 13,493, " " "Fairman" read "Gorman."

VOLUME II.

Page 1,290, question 18,501, in answer, instead of "a person you may rely on" read "of a person you relied on."
" 1,334, question 18,935, in question, instead of "$16,000" read "$216,000."
" 1,335, " 18,960, " " "$116,000" read "$216,000."
" 1,393, " 19,520, in answer, " "ties" read "the."

VOLUME III.

Page 33, on 8th line, before "receiving" read "of."
" 48, on 16th line, strike out "and yet."
" 81, on 22nd line, omit "with" before "plan" and read "on the."
" 160, in price column opposite contracts 9 and 10, instead of "53.33" read "53.53."
" 186, on 23rd line, take out "the" before "Guest & Co."
" 418, on 13th line, instead of "piles" read "Piles."
" 423, on 9th line, instead of "1769" read "1879."

INTRODUCTION.

The first official step towards the Canadian Pacific Railway was taken in 1870. On the 14th August, 1869, the Colonial Secretary addressed a despatch to the Governor of British Columbia on the subject of the incorporation of that colony with the Dominion of Canada. Rupert's Land and the North-West Territory being about to be incorporated in the Dominion, the main obstacle in the way of the Imperial Government entertaining the question had been removed. A legislature drawn from an extended area could hardly fail to deal with questions comprehensively and impartially. The interest of every province of British North America would be advanced by enabling the wealth, credit and intelligence of the whole to be brought to bear on every part. Especially was this true in the case of internal transit. The difficulties in the way of union, presented by distance, were in this respect an advantage, that they would render easy communication indispensable. A copy of this despatch was forwarded on the 16th August, 1869, to His Excellency the Governor-General. After some further correspondence a delegation from British Columbia came to Ottawa and conferred with the Privy Council. The result, an Order-in-Council passed on the 1st July, 1870, submitted certain conditions as a base of political union, amongst them being the following: —

Clause 11. "The Government of the Dominion undertake to secure the commencement, simultaneously, within two years from the date of the Union, of the construction of a railway from the Pacific towards the Rocky Montains, and from such point as may be selected east of the Rocky Mountains towards the Pacific, to connect the sea-board of British Columbia with the railway system of Canada; and further, to secure the completion of such railway within ten years from the date of the Union.

And the Government of British Columbia agree to convey to the Dominion Government, in trust, to be appropriated in such manner as the Dominion Government may deem it advisable in furtherance of the construction of the said railway, a similar extent of public lands along the line of railway throughout its entire length in British Columbia, not to exceed, however, twenty miles on each side of said line, as may be appropriated for the same purpose by the Dominion Government from the public lands in the North-West Territories and the Province of Manitoba. Provided that the quantity of land which may be held under pre-emption right or by Crown grant within the limits of the tract of land in British Columbia to be so conveyed to the Dominion Government, shall be made good to the Dominion from contiguous public lands; and provided further, that until the commencement, within two years, as aforesaid, from the date of the Union of the construc-

tion of the said railway, the Government of British Columbia shall not sell or alienate any further portion of the public lands of British Columbia in any other way than under right of pre-emption, requiring actual residence of the pre-emptor on the land claimed by him. In considerati n of the land so to be conveyed in aid of the construction of the said railway, the Dominion Government agree to pay to British Columbia from the date of the Union the sum of $100,000 per annum in half-yearly payments in advance."

Long prior to official action of any kind, the germinal idea of the Canadian Pacific Railway is to be found in the minds of the early explorers who sought a route across the continent for the purpose of facilitating intercourse with China and the East. The literature and history connected with those explorations are full of interest and instruction.

One of the earliest of those who stated the policy of a part rail and part water route, was Captain Synge, who, in 1848 and again in 1852, pressed his views on public attention. About the same time Major Carmichael Smith published a pamphlet, and Captain F. A. Wilson and A. B. Richards, of Lincoln's Inn, a book in which a railway across Britsh North America was advocated with great force as part of a scheme for relieving the pauperism, and decreasing the criminal population, in the United Kingdom.

Early in 1851, Mr. Allan McDonell, of Toronto, brought before the public and the Legislature of Canada, a scheme for building a railway from Lake Superior to the Pacific. He interested in his project one of the prominent statesmen of that day, the Hon. Henry Sherwood. A company was formed under the style of the "Lake Superior and Pacific Railroad Company," and on the 17th June, 1851, Mr. Sherwood obtained leave to bring in a bill to incorporate it. The main idea was that the Government should sell to a company, sixty miles wide of the lands from Lake Superior to the Pacific at a reduced rate, or at such price as should be paid the Indians for surrendering it to the Crown. He was in advance of his day, and the Standing Committee of Railways and Telegraphs, of which Sir Allan MacNab was Chairman, rejected his proposal, reporting that the application for a charter was premature. In 1853 and in 1855, Mr. McDonell returned to the charge, but on both occasions his petitions met the same fate as his bill.

On the 30th November, 1854, the Hon. A. N. Morin and others, petitioned for an Act of incorporation under the name of the "Northern Pacific Railway Company."

In 1857 a Select Committee of the English House of Commons was appointed to consider the state of the British possessions in North America under the administration of the Hudson Bay Company, or over which they

possessed license to trade. The subject of enquiry of this Committee of the Imperial Parliament does not bear directly on the Canadian Pacific Railway, but the evidence given before it by two distinguished Canadians was of such a character as to justify the reference made here.

The Hon. John Ross, who was the first witness examined, said that it was conceded by American engineers that British America afforded the most feasible route for a trans-continental railway. The admirable pamphlets alluded to could have made very little impression in Canada, for Mr. Ross testified before this Committee in 1857 that it was only during the summer of the previous year the subject of a trans-continental railway began to be discussed. "The question of the opening up of the territory has often for years been incidentally mooted, but a regular discussion of the question has never arisen until the course of the last summer, that I am aware of." Later on, in reply to questions, he dwelt on the importance of the line from an Imperial and Canadian standpoint, and with special reference to the trade of China and India. The late Chief Justice Draper was examined. He said he entertained no doubt his children would see a railway go across the country to the Pacific. He suggested that the Imperial Government should make an arrangement for the construction of the railway across the Rocky Mountains so as to avoid two colonial governments hereafter having to deal with the question, for he always found if you could foresee a difficulty it was better to anticipate and prevent it than have to deal with it after it had arisen.

On the 14th July, 1858, Mr. S. J. Dawson sent in a most valuable report on the surveys between Lake Superior and the Red River Settlement, and between the Red River and the Assineboine. Professor Hind, who made some reports about this time, afterwards published a book containing a narrative of the Red River exploring expeditions of 1857, and of the Assineboine and Saskatchewan exploring expedition of 1858. The natural advantages of the basin of Lake Winnipeg for a route across the continent is well stated in the second volume at p. 233. Hind quotes the Palliser exploration in favour of the practicability of the route.

This exploration organized by the Imperial Government was made during the years 1857, 1858, 1859 and 1860, and the journals, observations and detailed reports of Capt. Palliser and his colleagues have proved most valuable, and by prominent engineers examined before this Commission, have been referred to in a marked manner, and so as to suggest that they

had formed a hand-book in the earlier surveys in connection with the Canadian Pacific Railway.

The objects for which the Imperial Government sent out an expedition, were to obtain information relative to a route favourable for emigration; for this and other purposes, to ascertain the nature of the country westward of Red River and the elbow of the Saskatchewan; to find a pass or passes across the Rocky Mountains, north of the boundary line and south of a point not far from the Boat Encampment.

On the 23rd July, 1858, they arrived at 8 o'clock a.m. at the Nick Hills, where they obtained their first view of the Rocky Mountain Chain, which, to the north, appeared on the horizon like a blue line, while to the south they rose more distinct, higher, and more massive, "their summits clad in snow, which glittered at intervals like silver crowns." On the 18th of August, 1858, with a party of four men and nine horses, they made their journey through the Kananaskis Pass. Later in the same month Dr. Hector passed through Kicking Horse Pass. Captain Palliser, as Mr. S. J. Dawson at a later period pointed out, was favourably impressed with the British Kootanie Pass. Dr. Hector explored Howse Pass, which, having crossed, he found himself in the Valley of the Columbia, with a rocky mountainous country on either side.

With the formation of British Columbia into a colony a yet stronger impulse was given to the forces tending towards a railway across British North America, and several able pamphlets from the pens of persons interested in British Columbia appeared.

The most striking of these was a handbook on British Columbia, published anonymously in 1858, in the concluding portions of which were given extracts from leading English statesmen. The following occurs in an extract from a speech of Mr. Roebuck :—

"Plans had been laid before the Right Hon. Baronet, the Secretary for the Colonies (Sir E. B. Lytton), for carrying a railway completely across the continent, so that a direct communication would be established between England and Vancouver's Island by way of Halifax. This was a magnificent scheme; and he would tell the Right Hon. Baronet that if he succeeded in carrying out the scheme he would achieve a renown that would hand his name down to posterity as a great Colonial Minister."

Mr. Roebuck, on the occasion on which the speech was made, from which the above is an extract, was followed by Viscount Bury, Sir E. Bulwer Lytton, Mr. Gladstone and Lord John Russell, all of whom heartily approved of his views.

The handbook gives the proposal:—

"For carrying a railway from the head of Lake Superior through the Red River Settlement (about to be formed into a colony) and along the Valley of the Saskatchewan, and through British Columbia to the mouth of the Fraser River, opposite Vancouver's Island"; also from Halifax to Quebec.

A small map is appended to this handbook showing the projected line, much the same as the line surveyed by Mr. Fleming in 1871, and now under construction. From Ottawa it is drawn to Red River, to the south of Lake Manitoba, and then by the Valley of the Saskatchewan to the mouth of the Fraser River. There is a branch drawn from this main line from Red River to Fort William on Lake Superior, and another from Mattawa to the Georgian Bay.

The main line crosses the Columbia River twice about on a line with the Howse Pass. With the exception of the Rocky Mountain Pass the line proposed looks very much like the reality.

In 1858 the Provincial Legislature of Canada incorporated "The North-West Transportation, Navigation and Railway Company," with extensive and multifarious powers, but for reasons not apparent on the surface it never accomplished anything worthy of record.

In the Speech from the Throne, at the opening of the Canadian Parliament, on the 14th of August, 1863, there occurs the following passage:—

"I have received a despatch from the Secretary of State for the Colonies, enclosing copies of a correspondence between Her Majesty's Government and the Agent of the 'Atlantic and Pacific Transit and Telegraphic Company,' in reference to a proposal made by that Company for the establishment of a Telegraph and Postal communication between Lake Superior and New Westminster, in British Columbia. The importance of such an undertaking to the British North American Provinces, both in a commercial and in a military point of view, induces me to commend the subject to your consideration. Copies of the correspondence shall be laid before you, and I feel assured that, should any proposal, calculated to effect the establishment of such communication, on terms advantageous to the Province, be submitted to you, it will receive encouragement at your hands."

In 1868, Mr. Alfred Waddington, a distinguished engineer, and a man deeply interested in British Columbia, brought his views on the subject of the building a Canadian Pacific Railway before the British public. On the 9th of March, 1868, he read a paper before the Royal Geographical Society, in which he ably stated the whole case, and with a knowledge of the country so accurate and authoritative as might well excite admiration and surprise. In this paper, and in a pamphlet published shortly afterwards, like a practical man he with facts disposes of the difficulties in the way of

the enterprise. The port to which he directed his line was Bute Inlet, his main points being Ottawa, Fort Garry, Yellow Head Pass and Bute Inlet. The passage in which he tabulated the various passes indicated an assured knowledge and well grounded confidence.

Until his death Mr. Waddington was full of the idea of building the railway; and on the 24th of March, 1871, he and Mr. William Kersteman presented a petition to the Canadian Parliament, praying for an Act of incorporation under the name of the "Canadian Pacific Railway Company." He had a bill introduced and printed.

On the 17th of March, 1870, was read the petition of Charles P. Treadwell and others, praying for an Act of incorporation under the name of the "Canadian Pacific Railway and Navigation Company," with power to construct a railway from Ottawa through the Red River Territory and Rupert's Land to the Pacific Ocean, at Bute Inlet; also for the interposition of the House in their behalf, to assist them in obtaining a grant of wild lands in aid of their undertaking.

It may be worth here recording that Mr. Allan McDonell and many other projectors fixed on Fucas Straits, or what we now know as Burrard Inlet, as the objective point on the Pacific.

In January, 1871, the Legislative Council of British Columbia, which had been considering the action taken in the preceding year in Ottawa, adopted an Address to Her Majesty, representing that British Columbia was prepared to enter into the Union with the Dominion of Canada, on terms which were substantially the same as those agreed on between the British Columbia Delegation and the Dominion Privy Council in the previous year. The Address was, on the 23rd January, sent by the Lieutenant Governor of British Columbia to the Governor General of Canada.

On the 17th of March, 1871, agreeably to a recommendation of His Excellency the Governor General of Canada, a series of resolutions respecting the admission of British Columbia into the Union with Canada were referred to a Committee of the Whole House, and on the 30th of the same month the House of Commons of Canada in committee concurred in the terms and conditions of Union set forth in the above-mentioned Address, and resolved that an Address should be presented to Her Majesty under the 146th clause of the British North American Act, 1867, to unite British Columbia with the Dominion of Canada on the said terms and conditions. On the 31st the resolutions were reported, read a second time and agreed to, and a Select

Committee was appointed to draw up an Address to Her Majesty, embodying said resolutions, which was passed at the next sitting.

On the 16th of May, 1871, the terms of Union between the Dominion of Canada and British Columbia were confirmed by Her Majesty in Council, and union directed to take effect on the 20th of July, 1871.

On the 24th March, 1871, was read a petition from Alfred Waddington and Wm. Kersteman praying for an act of incorporation under the name of the "Canada Pacific Railway Company."

On the 11th of April, 1871, Sir Geo. E. Cartier moved, seconded by Mr. (now Sir Leonard) Tilley, that the House resolve itself into a Committee to consider the following resolution:—

"That the railway referred to in the Address to Her Majesty concerning the Union of British Columbia with Canada, adopted by this House on Saturday the 1st of April inst., should be constructed and worked by private enterprise and not by the Dominion Government, and that the public aid to be given to secure that undertaking should consist of such liberal grants of land, and such subsidy in money or other aid, not increasing the present rate of taxation, as the Parliament of Canada shall hereafter determine."

The House having resolved itself into Committee and the resolution having been reported, was read a second time and agreed to.

On the 13th of March, 1871, on a memorandum of the Minister of Public Works recommending the organization of a survey in view of the contemplated extension of the railway system of British North America from the Atlantic to the Pacific, an Order in Council was passed authorizing the Minister to organize for survey parties along the route of the proposed Railway Extension (1) between the Valley of the Ottawa and Nipigon; (2) between Nipigon and Fort Garry; (3) between Fort Garry and the Rocky Mountains; (4) between the Rocky Mountains and the Pacific Ocean.

For the fiscal year ending 30th June, 1871, the sum of $250,000 was appropriated for the Canadian Pacific Railway, of which the sum of $30,148.32 was expended.

On the 26th of April, 1872, Sir George E. Cartier obtained leave to bring in a bill respecting the Canadian Pacific Railway. The bill was read a first time and ordered for second reading on the following Tuesday.

On the 29th of April, 1872, a petition of the Hon. D. L. Macpherson and others was presented praying for an Act of incorporation under the name of the "Interoceanic Railway Company of Canada," and on the same day a

petition of Sir Hugh Allan and others was presented praying for an Act of incorporation under the name of the "Canada Pacific Railway Company." Bills on the above petitions were introduced on the 30th April and passed through the different stages, and in due course became law.

On the 7th of May, 1872, the House resolved itself into Committee to consider certain resolutions respecting the Canadian Pacific Railway. The resolutions were recommitted on the 21st and ordered to be reported. There were eight resolutions, the first affirming the expediency of providing for the construction of the said railway; the second relating to the extent between some point near Lake Nipissing and some point on the Pacific Ocean, and the sixth fixing the gauge at four feet eight inches and a-half. The third, fourth, fifth, seventh and eighth resolutions were as follows:—

"3. That the whole line of such railway be constructed and worked by one Company, to be approved of and agreed with by the Governor in Council, and be commenced within two years and completed within ten years from the admission of British Columbia into the Dominion.

"4. That the land grant to such Company to secure the construction and working of the railway, shall not exceed fifty million acres, in blocks of twenty miles in depth on each side of the line of the railway in Manitoba, the North-West Territories and British Columbia, alternating with blocks of like depth reserved for the Government of the Dominion, and to be sold by it, and the proceeds of such sale applied towards reimbursing to the Dominion the sums expended by it on the construction of the said railway; such lands to be granted from time to time as any portion of the railway is completed, in proportion to the length, difficulty of construction and cost of such portion, and in Ontario such land grant to be subject to the arrangement which may be made in that behalf by the Government of the Dominion with the Government of that Province: provided that, if the total quantity of land in the alternate blocks to be so granted to the Company should be less than fifty million acres, then the Government may in its discretion grant to the Company such additional quantity of land elsewhere as will make up, with such alternate blocks a quantity not exceeding fifty million acres; and in the case of such additional grant, a quantity of land elsewhere equal to such additional grant shall be reserved and disposed of by the Government for the same purposes, as the alternate blocks to be reserved as aforesaid by the Government on the line of the railway.

"5. That the subsidy or aid in money to be granted to such Company be such sum not exceeding thirty million dollars in the whole, as may be agreed upon between the Government and the Company, such subsidy to be granted from time to time by instalments as any portion of the railway is completed in proportion to the length, difficulty of construction and cost of such portion; the company allowing the cost of the surveys of the line in 1871-72, as part of such subsidy; and that the Governor in Council be authorized to raise by loan such sum as may be required to pay such subsidy.

"7. That the Government may make such agreement as aforesaid with any Company, approved by the Governor in Council, and being incorporated with power to construct a railway on a line approved by him, from Lake Nipissing to the Pacific Ocean; or, that if

there be two or more such companies having power singly or together to construct such railway, they may unite as one Company. and such agreement may be made with the united Company, or, that if there be no such Company with whom the Government deems it advisable to make such agreement, and there be persons able and willing to form such Company, the Governor may by charter incorporate them, and make such agreement with the Company so incorporated.

"8. That the Government may further agree with the Company with whom such agreement as aforesaid shall have been made, to construct and work a branch line of railway from some point on the main line in Manitoba to some point on the boundary line between that province and the United States, to connect with the system of railways in the said States, and another branch line from some point on the main line to some point on Lake Superior, in British Territory; and that such branch lines shall be deemed part of the said Canadian Pacific Railway, and a land grant in aid thereof may be made by the Government to such extent as may be agreed upon between the Government and the Company, not however to exceed 20,000 acres per mile of the branch line in Manitoba, nor 25,000 acres per mile in the branch line to Lake Superior."

A Bill embodying these resolutions became law on the 1st June, 1872, under the title of "An Act respecting the Canadian Pacific Railway, 35 Vic., cap. 71."

For the fiscal year ending 30th June, 1872, $250,000 more was appropriated, which made, together with the balance of the previous year, $469,851.68, the expenditure exceeding the appropriation by $19,576.48, having been in effect $489,428.16.

On the 31st of Jan, 1873, His Excellency the Governor General in Council approved of a report of a Committee of the Honourable the Privy Council, recommending that, as the Interoceanic Railway Company, and the Canada Pacific Railway Company would not unite, a company should be incorporated under the 15th sec. of the Canadian Pacific Railway Act (35 Vic., cap. 71) by charter, for the construction and working of the Pacific Railway, and further recommending that negotiations for that purpose should be opened with certain gentlemen who were ready to enter into an agreement for the above purpose.

On the 5th Feb, 1873, the charter was signed by the Governor General by the provisions of which a company, at the head of which was Sir Hugh Allan, bound themselves to build the railway within ten years from the 20th July, 1871, in consideration of which they were to receive a land grant of 50,000,000 acres, and a subsidy of $30,000,000, payable from time to time in instalments.

The Governor General, on the 13th of March, 1873, communicated to the House of Commons, by Message, that he had granted a charter

to a body of Canadian capitalists for the construction of the Canadian Pacific Railway: said message was also accompanied by papers and correspondence relating to the subject, and a communication from the Government showing the futile efforts which had been made to bring about an amalgamation between the Interoceanic Railway Company of Canada and the Canada Pacific Railway Company.

On the 31st of March, 1873, Sir John A. Macdonald laid before the House correspondence on the subject of Kersteman's scheme for the construction of the Canadian Pacific Railway.

In consequence of a motion made on the 2nd of April, 1873, by the Hon. Lucius Seth Huntington, concerning the Canadian Pacific Railway, and which alleged amongst other things that he believed that an understanding had been entered into between the Government and gentlemen named by him, concerning the contract for the construction of the said railway, which was negatived;

The Right Hon. Sir John Macdonald, on the 8th of April, moved for a Committee to investigate and report on the several matters contained in Mr. Huntington's motion. The motion was carried.

A bill enabling the Committee to receive evidence under oath having been disallowed, His Excellency the Governor General wrote to Sir John Macdonald suggesting a Royal Commission in order to get over the difficulty.

On the 13th of August Parliament met and was prorogued.

On the 14th of August a Royal Commission was issued to the Hon. Charles Dewey Day, the Hon. Antoine Polette, and James Robert Gowan, Esq., to enquire into the matters and statements made by the Hon. Lucius Seth Huntington.

The Commission met at Ottawa on the 18th of August, 1873, and closed its sittings on the 1st of October. The terms of the Commission did not require the Commissioners to express their opinion. In their report they describe the course of the enquiry, and point to the evidence contained in thirty-six depositions.

On the 23rd of October, 1873, Parliament met.

The Speech from the Throne contained these words:

"The Canadian Pacific Company, to whom a Royal Chapter was granted, have, I regret to say, been unable to make the financial agreements necessary for the construction of that

great undertaking. They have, therefore, executed a surrender of their charter, which has been accepted by me. You will, I trust, feel yourselves called upon to take steps to secure the early commencement and vigorous prosecution of that railway, and thus to carry out in good faith the arrangement made with the Province of British Columbia. A measure for this purpose will be submitted for your consideration."

On the 7th of November, the Ministry having resigned during the debate on the Address, Parliament was prorogued.

The amount spent on the Pacific Railway for 1872-73 was $561,818.44, as per Public Accounts, the sum appropriated being $600,000.

Parliament met on the 26th of March, 1874. In the Speech from the Throne the Members of the Senate and House of Commons were told:

"The enactment of 1872, respecting the Canadian Pacific Railway, having failed to secure the prosecution of that great enterprise, you will be called upon to consider what plan will best and most speedily provide the means of transcontinental communication with British Columbia. A report of the Chief Engineer will be laid before you, showing what progress was made during the past year in the surveys connected with the proposed line."

On the 28th of April, Mr. (now Sir Richard) Cartwright, seconded by the Hon. Mr. Dorion, moved the House into Committee to consider resolutions affirming the expediency of authorizing the raising, by way of loan, for the purpose of the construction of the Canadian Pacific Railway and the improvement and enlargement of the canals, a sum of money not exceeding £8,000,000 sterling. The resolutions were agreed to on the 5th of May, and a bill was introduced founded on the same, which became law. (37 Vic., cap. 2)

During the session of 1874 an Act was passed intituled "An Act to provide for the construction of the Canadian Pacific Railway" (37 Vic., c. 14) which provided that the railway might be built as a Government work or by a subsidized company. The line was by this Act divided into four sections and two branches: the branches from the eastern terminus to Georgian Bay, and from Fort Garry to Pembina; the four sections: (1) From Lake Nipissing to Lake Superior; (2) from Lake Superior to Red River; (3) from Red River to some point between Fort Edmonton and the foot of the Rocky Mountains; (4) from the western terminus of the third section to the Pacific. As soon as practicable, after the location of the line should be determined on, a line of electric telegraph was to be constructed in advance of the railway and branches, along their whole extent respectively. Should the work be built by a company or companies,

$10,000 per mile in monthly instalments, as the work progressed, was to have been paid, and land was to have been given, not exceeding 20,000 acres, for each mile in alternate sections of twenty square miles along the line of the railway or at convenient distance from it.

Section 11 provided that no contract for any portion of the main line should be binding until it should have been laid before the House for a month, or should have been approved by a resolution of the House.

Section 12 provided for building the line as a Government work. In this case the construction was to have been let out by contracts offered to public competition.

Sections 13 and 16 provided for the building of the branches either as a public or by private enterprise.

Section 14 provided for the granting of a bonus or bonuses to existing lines, not exceeding $12,000 per mile so as to secure the construction of the branch lines extending from the eastern terminus of the Canadian Pacific Railway to connect with existing or proposed lines of railway.

The expenditure on the railway for 1873-74 was $310,224 88, the amount authorized being $538,181 50.

British Columbia, feeling that she had some ground of grievance because of the non-fulfilment of the conditions of Union, Mr. Edgar was in February, 1874, sent to British Columbia. His mission being unsuccessful he was recalled. Mr. Walkem proceeded to London as a delegate from British Columbia. The result of much negotiation was that Lord Carnarvon suggested that both Governments should accept him as arbitrator. In an Order in Council passed on the 23rd July, 1874, in which the Committee of Council "advise that Lord Carnarvon be informed they would gladly submit the question to him, whether the exertions of the Government, the diligence shown and the offers made have, or have not, been fair and just and in accordance with the spirit of the agreement," negotiations were prolonged, and in a despatch to the Earl of Dufferin, dated the 17th November, 1874, Lord Carnarvon announced the conclusions at which he had arrived, namely:

"1. That the railway from Esquimalt to Nanaimo shall be commenced as soon as possible and completed with all practicable despatch.

"2. That the surveys on the mainland shall be pushed on with the utmost vigour. On this point, after considering the representations of your Ministers, I fear that I have no alternative but to rely, as I do most fully and readily, upon their assurances that no legitimate

effort or expense will be spared, first to determine the best route for the line, and secondly, to proceed with the details of the engineering work. It would be distasteful to me, if indeed, it were not impossible to prescribe strictly any minimum of time or expenditure with regard to work of so uncertain a nature; but happily, it is equally impossible for me to doubt that your Government will loyally do its best in every way to accelerate the completion of a duty left freely to its sense of honour and justice.

"3. That the waggon road and telegraph line shall be immediately constructed. There seems here to be some difference of opinion as to the special value to the Province of the undertaking to complete these two works; but after considering what has been said, I am of opinion that they should both be proceeded with at once, as is indeed suggested by your Ministers.

"4. That $2,000,000 a year, and not $1,500,000, shall be the minimum expenditure on railway works within the Province from the date at which the surveys are sufficiently completed to enable that amount to be expended on construction. In naming the amount I understand that, it being alike the interest and wish of the Dominion Government to urge on with all speed the completion of the works now to be undertaken the annual expenditure will be as much in excess of the minimum of $2,000,000 as in any year may be found practicable.

"5. Lastly, that on or before the 31st of December, 1890, the railway shall be completed and open for traffic from the Pacific seaboard to a point at the western end of Lake Superior at which it will fall into connection with existing lines of railway through a portion of the United States, and also with the navigation on Canadian waters. To proceed at present with the remainder of the railway extending, by the country northward of Lake Superior, to the existing Canadian lines, ought not, in my opinion, to be required, and the time for undertaking that work must be determined by the development of settlement and the changing circumstances of the country. The day is, however, I hope not very distant when a continuous line of railway through Canadian territory will be practicable, and I therefore look upon this portion of the scheme as postponed rather than abandoned."

Subsequently, (20th Sept., 1875) an Order in Council was passed respecting terms with British Columbia, which led to further negotiations

On the 3rd March, 1875, Mr. Mackenzie laid before the House articles of agreement entered into between Asa Belknop Foster and Her Majesty Queen Victoria, represented by the Minister of Public Works of Canada, for the construction and working of the Georgian Bay Branch of the Canadian Pacific Railway, bearing date the 27th Feb., 1875.

On the 13th March, 1875, upon the question that this House doth concur with the Committee (of Supply) in the following resolution :—

"That a sum not exceeding $6,250,000 be granted to Her Majesty to defray expenses of Pacific Railway, viz.:—Telegraph line and construction of roadway $1,000,000; steel rails and fastenings, $2,000,000; Pembina Branch, $500,000; Fort Shebandowan, $500,000; Georgian Bay Branch, $500,000; Esquimalt to Nanaimo, $500,000; Mainland to Columbia, $250,000; Locks at Fort Francis, $150,000; Rainy Lake and Shebandowan, $540,000; Manitoba and

Saskatchewan, $50,000; Steamers, River Saskatchewan, and improvements in rapids, $60,000; Lake of the Woods to Red River, $500,000, for the year ending 30th June, 1876."

Mr. (now Sir Charles) Tupper moved in amendment, seconded by Mr. Pope, that the following words be added :—

"That in view of the engagements entered into during the past Session between the Government of Canada and the Imperial Government and British Columbia, to build a railway without delay from Nanaimo to Esquimalt, on Vancouver Island; to expend not less than $2,000,000 per annum, in British Columbia, on the Canadian Pacific Railway, and to complete the construction of the line from the Pacific Ocean to the shores of Lake Superior in 15 years; this House is of opinion that no time should be lost in beginning the eastern portion of the Canadian Pacific Railway, and constructing it as rapidly as is consistent, with a due regard to economy, from a point fixed by Parliament at a point near to and south of Lake Nipissing, westward to Lake Nepigon, and thence to Red River, commencing at Lake Nepigon, and working eastward and westward, and that Government should employ the available funds of the Dominion in the first place in the completion of that great national work. A continuous railway on Canadian territory by the shortest route from the Atlantic to the Pacific Ocean."

Which amendment passed in the negative; and the question being again proposed, Mr. Masson moved an amendment which was withdrawn, when the resolution was agreed to.

On the 4th of November, 1874, an Order-in-Council was passed advising that a subsidy of $12,000 per mile be granted to the Canada Central Railway Company under the terms of the Act 37 Vic., cap. 14, providing for the construction of the Canadian Pacific Railway, said grant to aid in constructing their line from Douglas west to the eastern end of the branch railway proposed to be built from Georgian Bay.

On the 13th of March, 1875, Mr. Mackenzie moved the ratification of the said Order;

Mr. Masson moving an amendment to the effect that no contract should be entered into with any company for the construction of the Georgian Bay Branch of the Canadian Pacific Railway, nor any subsidy granted until a thorough and complete instrumental survey should have been made of the route proposed. The amendment was defeated, and the main question was resolved in the affirmative.

On the 31st March, 1875, Mr. (now Sir Charles) Tupper moved an address to His Excellency, praying for copies of specifications and contracts for any portion of the Canadian Pacific Railway telegraph, with correspondence.

Mr. Bowell moved an amendment to add the words: "and this House regrets that contracts have been made by the Government for the construc-

tion of the line of telegraph from Lake Superior to Cash Creek, before the location of the Canadian Pacific Railway has been determined on."

To this amendment, on the 2nd April, Mr. Kirkpatrick moved in amendment to add the words: "contrary to the Statute authorizing the construction of the said telegraph line, and therefore this House does not approve of the said contracts." Both amendments passed in the negative. Then the main question having been put, the address was ordered to be presented.

On the 3rd of April, 1875, Mr Mackenzie laid before the House the contracts 13 and 14, in connection with the Canadian Pacific Railway, for the grading and bridging from Red River to Lake of the Woods, containing bills of works, general specifications and conditions of contract; and for the grading and bridging from Fort William to Shebandowan.

On the 3rd of April, 1875, Hon. Mr. Mackenzie moved that the House ratify the contract proposed to be entered into with Messrs. Sifton & Ward, for that portion of the Pacific Railway extending from Fort William to Shebandowan, a distance of about forty-five miles, at a cost of $406,194.

Mr. (now Sir Charles) Tupper, seconded by Sir John Macdonald, moved that the consideration of the approval of the said contract be postponed to this day three months, which was passed in the negative after a division. The House then divided on the main question, when it passed in the affirmative.

On the same day the Government were authorized to enter into a contract, during the recess, for the construction of that portion of the Pacific Railway from Rat Portage to Cross Lake, thirty-seven miles.

The expenditure on the railway for 1874-75 was $1,546,241.67, the amount authorized being $2,650,000.

On the 20th of September, 1875, an Order-in-Council was passed, in which it was stated that the Committee of Council had had under consideration the difficulties arising out of the agreement made in 1871 for the construction of the Canadian Pacific Railway, the conditions of which were quite impracticable of fulfilment; that it had been agreed that after location, $2,000,000 should be expended yearly upon construction in British Columbia, and that a railway from Esquimalt to Nanaimo should be built; that every step in the negotiations leading to this result was subject to the condition that the existing rates of taxes should not be increased; that there were obvious

reasons, under ordinary circumstances, against the Canadian Government building a line from Nanaimo to Esquimalt, which really formed no part of the line of the Canadian Pacific Railway, and was purely a local work; that the bill for building this railway was thrown out in the Senate; that it was reasonable British Columbia should herself construct this work, and that $750,000 would be a liberal compensation for not going on with the work.

On the 6th of December, 1875, the Privy Council of British Columbia declared that they dissented from the views of the Order-in-Council described above, and refused the offer made.

Early in 1876, the members of the Legislative Assembly of the Province of British Columbia, in session assembled, petitioned Her Majesty, reciting the petition of the British Columbia Government of 1874, the Carnarvon settlement, the assent as they alleged thereto of the Dominion Government, and stating that the Dominion Government had "almost wholly" disregarded the terms of the said settlement, the promised commencement of the railway not having taken place either on the island or on the mainland, nor had the agreement in the settlement for the immediate construction of the Provincial section of the Trans-Continental Telegraph Line been carried out. The Minute of the Privy Council of Canada of the 20th September, 1875, is then referred to, and it is pointed out that the Dominion Government in the said Minute affirmed that the section of the railway on Vancouver Island is not part of the Pacific Railway, but was offered to British Columbia in compensation for local losses caused by delays in the construction of the Pacific Railway, whereas no such offer was ever made or even suggested to the Province of British Columbia; "that the Dominion Government state in their Minute of the 20th September last, that it cannot be too clearly understood that they will not abide by or observe the agreements in the settlement for an annual railway expenditure of $2,000,000 in the Province, and for the completion of the railway from the Pacific to Lake Superior by the year 1890, if the performance of such agreements should interfere with the conditions of a resolution passed by the House of Commons in 1871, after our terms of Union had been assented to by that body. The terms of this resolution were in effect that the railway should be constructed and worked by private enterprise and not by the Dominion Government; and that subsidies in land and moneys to an extent that would not increase the rate of Dominion taxation, should be given in aid of the work by the Government;" but in 1874 the terms of said resolution

were abandoned, rate of taxation was increased, and the construction of railway undertaken by Government; the offer of $750,000 as cash bonus for foregoing the fixed term for completion of the Railway and the agreements for a yearly expenditure, and the refusal of the offer having been set out, the original terms of Union are recited, and the prayer asks that the Dominion Government be moved to immediately carry out the terms of the Carvarnon settlement.

On the 13th of March, 1876, an Order-in-Council was passed reviewing the whole controversy with British Columbia, denying some of the conclusions of the above petition, and concluding:—"It remains only to endeavour to construct the Pacific Railway as rapidly as the resources of the country will permit."

On the 3rd April, 1876, Mr. Mackenzie presented a return to an address for a statement of the tenders received for the construction of a line of telegraph in connection with the Pacific Railway, showing the names of the parties tendering, the amount asked by each such party, and the names of the sureties; also copies of the contract between the Government and F. Barnard, Esq., in relation to the construction of the said line of telegraph.

On the 7th of April, 1876, Mr. Young reported from the Committee of Supply, several resolutions which read as follows:—

"1. *Resolved*, That a sum not exceeding two million eight hundred and ten thousand dollars be granted to Her Majesty, to defray expenses of Pacific Railway for the year ending 30th June, 1877.

"2. *Resolved*, That a sum not exceeding five hundred thousand dollars be granted to Her Majesty, to defray expenses of Pacific Railway Survey and Engineering, for the year ending 30th June, 1877.

The first resolution being read a second time,

Mr. Ross (Middlesex) moved, seconded by Mr. Sinclair, and the question being put, that the words "and while granting this sum, this House desires to record its view that the arrangements for the construction of the Canadian Pacific Railway, should be such as the resources of the country will permit without increasing the existing rates of taxation," be added to the end thereof; the House divided: and the names being called for, the numbers were, yeas 149; nays 10.

On the 8th of April, 1876, the second resolution being read a second time Mr. Plumb moved, seconded by Mr. Kirkpatrick, and the question being put, that the words "that while concurring in this vote, this House desires

to record its opinion that the country is pledged to the construction of the Pacific Railway in its agreement with British Columbia, and that it is in accordance with that agreement, and with the public interest, that the surveys should be energetically proceeded with, in order that the construction of the road should be prosecuted as rapidly as the resources of the country will permit without adding to the burdens of taxation," be added at the end of the said resolution ; the House divided : and the numbers were, yeas 36 ; nays 89.

So it passed in the negative.

The said resolution was then agreed to.

On the 11th of April, on motion of Hon. Alex. Mackenzie, seconded by Mr. Blake,

"*Resolved*, That the Government be authorized to enter into contracts during the recess with parties sending in the lowest available tenders for the works of construction of the following portions of the Canadian Pacific Railway, viz. :—From Fort William westward towards Lac des Mille Lacs, and the crossing of Steel River ; from Rat Portage to Cross Lake."

Expenditure 1875-6, $3,346,567.06 ; authorized, $6,250,000.

On the 28th February, 1877, in consequence of motions by Mr. McCarthy and Mr. Kirkpatrick, an address was ordered to be presented to His Excellency the Governor General asking for papers relative to the construction of the Georgian Bay Branch and specially for a statement of the service or services for which the sum of $109,000.50 had been paid to A. B. Foster on account of that contract ; also for evidence that the Canada Central Railway Company had provided sufficient means with the Government bonus to secure the completion of the line on or before Jany., 1877 ; also for statements as to payments and the value of rails delivered at any point of the said line, &c.

On the 26th March, 1877, Mr. Mackenzie laid on the table copies of contracts entered into for construction of the Canadian Pacific Railway.

On the 10th of April, 1877, on the motion that Mr. Speaker leave the chair, Mr. Kirkpatrick moved an amendment condemning as unconstitutional and a violation of the Act of 1874 the building of Fort Frances Lock, as a work of the Dominion, by time work. The motion passed in the negative.

On the 21st of April, on the motion that the Speaker leave the chair, Mr. Tupper moved that that House could not approve of the course taken by the Government with respect to the Canadian Pacific Railway, which passed in the negative on the 24th.

The expenditure on the railway during 1876-77 was $1,691,149.97, $3,310,000 being authorized.

On the 5th of March, 1878, Mr. Mackenzie presented a return to an address for a copy of any reports in possession of the Government made in 1877 by Admiral de Horsey respecting the port or ports most suitable for a terminus of the Canadian Pacific Railway in British Columbia, with correspondence.

On the 4th of April, 1878, a bill to amend "the Canadian Pacific Railway Act of 1874" was read a second time. This bill was amended in the Senate, and the Commons not agreeing with the amendments of the Senate it dropped.

On the 18th April, 1878, an Order in Council was passed which, having recited the Georgian Bay Branch contract with Mr. Foster in 1874, and its cancellation in 1876; the Order in Council of the 4th of November, 1874, granting a subsidy to the Canada Central Railway, the advised pause in the work in consequence of the lapse of the Georgian Bay Branch contract; certain reports; a letter from the Canada Central Company, dated the 10th Feb., 1877, proposing to build the westward extension from Pembroke to the south-east corner of Lake Nipissing, for a total bonus of $1,440,000; a letter from Mr. Fleming saying his information would go to show that a line with more favorable gradients might be obtained on the route now proposed to be adopted by the Canada Central, and that it would serve the interests of the country fully as well, as the line to which it was a proposed alternative; a resolution of the House of Assembly of the Province of Quebec, in favour of a junction at Pembroke; having recited these, the Order in Council recommended that the proposal of the Canada Central should be accepted, the Company within three months from the ratification of the Order in Council, to satisfy the Minister of Public Works that they had entered into a *bonâ fide* contract for the building of the Railway.

This Order in Council having been laid before the House, on the 24th of April, on the 7th of May, on the motion of Mr. Mackenzie, was ratified.

The expenditure on the Pacific Railway during 1877-8, was $2,228,373.18, the sum authorized being $2,679,900.

On the 13th March, 1879, Mr. (now Sir Charles) Tupper laid before the House—

"Articles of Agreement entered into between Heney, Charlebois and Flood, and Her Majesty Queen Victoria, represented by the Minister of Public Works of Canada, to do the excavation, track-laying, etc., of the Georgian Bay Branch of the Canadian Pacific Railway, from Station O, South River, to French River, 50 miles (37th contract).

"Also, articles of agreement entered into between Kavanagh, Murphy & Upper, and Her Majesty Queen Victoria, represented by the Minister of Public Works of Canada, to do excavation, grading, track-laying, etc,, of part of the Pembina Branch, between St. Boniface and Emerson, Canadian Pacific Railway (33rd contract).

"Also, agreement by Joseph Whitehead (13th Sept., 1878,) to make embankments on Sifton, Ward & Co.'s contract, No. 14, Canadian Pacific Railway, at a less cost to Government than per contract of Sifton, Ward & Co., No. 4572, accepted by the Minister of Public Works, 8th October, 1878, and further agreement by Joseph Whitehead.

Also, articles of agreement entered into between Gouin, Murphy & Upper, and Her Majesty Queen Victoria, represented by the Minister of Public Works of Canada, to build a ten stall engine house on the station ground at Selkirk, Manitoba, for the Pembina Branch of the Canadian Pacific Railway (40th contract).

And also, agreement entered into between George Stephen and Her Majesty Queen Victoria, represented by the Minister of Public Works of Canada, respecting running powers over the Pembina Branch, Canadian Pacific Railway.

On the 21st March, 1879, Mr. Tupper presented:—

"Articles of agreement entered into between Fraser, Manning & Co. and Her Majesty Queen Victoria, represented by the Minister of Public Works of Canada, to do the excavation, grading, bridging ballasting, track-laying, &c., from Eagle River to Keewatin, 67 miles, on the line of the Canadian Pacific Railway (B) contract No. 42.

"Also, articles of agreement entered into between Thomas Marks, John Ginty, P. Purcell and H. Ryan and Her Majesty Queen Victoria, represented by the Minister of Public Works of Canada, to do the excavation, grading, bridging, ballasting, track-laying, &c., from English River to Eagle River, 118 miles, on the line of the Canadian Pacific Railway (A).

"And, also, schedules of tenders, for contracts, Canadian Pacific Railway, viz.:—Schedule A, from English River to Eagle River, 118 miles; schedule B, from Eagle River to Keewatin, 67 miles, and schedule C, from English River to Keewatin, 185 miles."

On the 30th of April, 1879, Mr. Tupper, laid before the House:—

"Agreement between Joseph Upper, Benjamin W. Folger, James Swift and Matthew H. Folger, under the name and firm of 'Joseph Upper & Co,' and Her Majesty the Queen, represented by the Minister of Public Works of Canada, to equip and work the Pembina branch of the Canadian Pacific Railway, in lieu of Government, under agreement of 3rd August, 1878, of George Stephen and St. Paul & Pacific Railway Company."

On the 8th of May, 1879, several resolutions were reported from Committee of Supply for Pacific Railway purposes, the total vote being $5,910,000

On the 10th of May, 1879, Mr. Tupper proposed the following resolutions:—

"1. *Resolved*, That engagements have been entered into with British Columbia as a condition of Union with Canada, that a line of railway to connect the Atlantic with the Pacific shall be constructed with all practical speed.

"2. *Resolved*, That the Pacific Railway would form a great Imperial highway across the continent of America, entirely on British soil, and would provide a new and important route from England to Australia, to India and to all the dependencies of Great Britain in the Pacific; as also to China and Japan.

"3. *Resolved*, That reports from the Mother Country set forth an unprecedented state of enforced idleness of the working classes, and the possibility of a scheme of relief on a large scale being found indispensable to alleviate destitution.

"4. *Resolved*, That the construction of the Pacific Railway would afford immediate employment to numbers of workmen, and would open up vast tracts of fertile land for occupation, and thus would form a ready outlet for the over-populated districts of Great Britain and other European countries.

"5. *Resolved*, That it is obvious that it would be of general advantage to find an outlet for the redundant population of the Mother Country within the Empire, and thus build up flourishing colonies on British soil, instead of directing a stream of immigration from England to foreign countries.

"6. *Resolved*, That in view of the importance of keeping good faith with British Columbia, and completing the consolidation of the Confederation of the Provinces in British North America, and for the purpose of extending relief to the unemployed working classes of Great Britain, and affording them permanent homes on British soil; and in view of the national character of the undertaking, the Government of Canada is authorized and directed to use its best efforts to secure the co-operation of the Imperial Government in this great undertaking, and obtain further aid by guarantee or otherwise in the construction of this great national work.

"7. *Resolved*, That it is further expedient to provide (1.) That one hundred million acres of land and all the mineral they contain, be appropriated for the purposes of constructing the Canadian Pacific Railway. (2.) That the land be vested in Commissioners to be specially appointed, and that the Imperial Government be represented on the Commission. (3.) That all the ungranted land within twenty miles of the line of the Canadian Pacific Railway belonging to the Dominion be vested in such Commission; and that when the lands along the line of the Canadian Pacific Railway are not of fair average quality for settlement, a corresponding quantity of lands of fair quality shall be appropriated in other parts of the country, to the extent in all of 100,000,000 acres. (4.) That said Commissioners be authorized to sell, from time to time, any portions of such land at a price to be fixed by the Governor-in Council on their recommendation at the rate of not less than $2 per acre; and that they may be required to invest the proceeds of such sales in Canadian Government securities, to be held exclusively for the purpose of defraying the cost of the construction of the Canadian Pacific Railway.

"8. *Resolved*, That the withdrawal for sale and settlement of lands for twenty miles on each side of the located line of the Pacific Railway, has, in part, had the effect of throwing settlements south and west of Lake Manitoba.

"9. *Resolved*, That in the existing state of things, it is desirable to combine the promotion of colonization with railway construction on the Canadian Pacific Railway west of Red River.

"10. *Resolved*, That the Government be authorized and directed to locate a portion of the Canadian Pacific Railway from the Red River westerly, running to the south of Lake Manitoba, with a branch to Winnipeg; and if they deem it advisable to enter into a contract for expending a sum not exceeding $1,000,000 in constructing the said railway without previously submitting the contracts to Parliament.

"11. *Resolved*, That it is expedient to make further explorations in the Peace and Pine River districts, and other sections of the country not yet examined, in order to ascertain the feasibility of a line through the largest extent of fertile territory, before beginning the work of construction in British Columbia.

"12. *Resolved*, That in the opinion of the House the selection of the Burrard Inlet terminus was premature.

"13. *Resolved*, That it is necessary to keep good faith with British Columbia, and commence the construction of the railway in that province as early as is practicable.

"14. *Resolved*, That the Government be authorized and directed to make such further explorations as they may deem necessary for the said purpose, and so soon as they finally selected and located the line, to enter into contracts for constructing a portion of the same, not exceeding 125 miles, without the further sanction of Parliament, so that the work of construction may, at latest, be commenced during the present season, and thereafter be vigourously prosecuted."

On the 15th of May, 1879, assent was given to an Act to amend "the Canadian Pacific Railway Act, 1874," embodying the main features of these resolutions.

On the same day assent was given to another amending Act, which would enable the Governor-in-Council to make certain arrangements as to the Pembina Branch.

The expenditure for 1878-79 was $2,240,285.47, the amount authorized being $2,949,700.

On the 16th Feby., 1880, Sir Charles Tupper laid before the House:—

"Articles of agreement entered into between John Ryan and Her Majesty Queen Victoria, represented by the Minister of Railways and Canals, to do the excavation, grading, bridging, track-laying, ballasting, station building, &c., on the Colonization Railway, northwesterly from Winnipeg, Manitoba, about 100 miles, Canadian Pacific Railway.

"Also, articles of agreement entered into between Andrew Onderdonk and Her Majesty Queen Victoria, represented by the Minister of Railways and Canals, to do the excavation, grading, bridging, tracklaying, ballasting, &c, from Emory's Bar to Boston Bar, British Columbia, about 29 miles (Section A) Canadian Pacific Railway.

"Also, articles of agreement entered into between Andrew Onderdonk and Her Majesty Queen Victoria, represented by the Minister of Railways and Canals, to do the excavation, grading, bridging, track-laying, ballasting, &c., between Lytton and Junction Flat, about six miles above Spence's Bridge on River Thompson, British Columbia, about 28¼ miles in length (Section C) Canadian Pacific Railway.

"Also, articles of agreement entered into between Ryan, Goodwin & Co. and Her Majesty Queen Victoria, represented by the Minister of Railways and Canals, to do the excavation, grading, bridging, track-laying, ballasting, &c., between Boston Bar and Lytton, British Columbia, about 29 miles (Section B) Canadian Pacific Railway.

"Also, articles of agreement entered into between Andrew Onderdonk and Her Majesty Queen Victoria, represented by the Minister of Railways and Canals, to do the excavation, grading, bridging, track-laying, ballasting, &c., between Junction Flat and Savona's Ferry British Columbia, about 40¼ miles in length (Section D) Canadian Pacific Railway.

"Also, articles of agreement entered into between Miller Bros. & Mitchell and Her Majesty Queen Victoria, represented by the Minister of Railways and Canals, to supply 700 tons of railway spikes, delivered 400 tons at Fort William and 300 tons at Montreal, for the Canadian Pacific Railway.

"Also, articles of agreement entered into between the Dominion Bolt Company and Her Majesty Queen Victoria, represented by the Minister of Railways and Canals, to supply 35 tons of fish-plates, bolts and nuts at Fort William, for the Canadian Pacific Railway.

"Also, articles of agreement entered into between R. Dickson and Her Majesty Queen Victoria, represented by the Minister of Railways and Canals, to erect station buildings and platforms on the Pembina Branch of the Canadion Pacific Railway.

"Also, articles of agreement entered into between Guest & Co. and Her Majesty Queen Victoria, represented by the Minister of Railways and Canals, for the supply of 10,000 tons of steel rails, &c., for the Canadian Pacific Railway.

"And, also, articles of agreement entered into between West Cumberland Iron and Steel Company, limited, and Her Majesty Queen Victoria, represented by the Minister of Railways and Canals, to supply 5,000 tons of steel rails, with copies of cablegrams and correspondence in connection with letting of the following contracts: The West Cumberland Iron and Steel Co., limited, for 2,000 tons; the Barrow Co., for 1,500 tons; the Ebbw Vale Co., for 1,500 tons, and the Patent Nut and Bolt Co. for 48 tons.

On the 10th March, 1880, Sir Charles Tupper laid before the House:—

"Articles of agreement entered into between the Barrow Hœmatite Steel Company, limited, and Her Majesty Queen Victoria, represented by the Minister of Railways and Canals, for the supply of 30,000 tons of steel rails, with fish plates, bolts and nuts, for the Canadian Pacific Railway.

On the 16th April, 1880, on the question that the Speaker leave the Chair, Mr. Blake moved, seconded by Sir A. J. Smith, that the public interests require that the work of constructing the Pacific Railway in British Columbia should be postponed.

This motion, on the morning of the 21st of April, 1880, was negatived on a division.

On the 5th of May, Mr. Rykert, reported from Committee a resolution embodying a substitution for the seventh of the series of resolutions relating to the Canadian Pacific Railway adopted by the House on the 12th and 13th of May last:—

"(*a.*) That 100,000,000 acres of land in Manitoba and the North-West Territories be appropriated for the purpose of constructing the Canadian Pacific Railway.

"(*b.*) That such lands shall be from time to time selected and reserved by order of the Governor in Council as railway lands, and shall be of fair average quality for settlement.

"(*c.*) That such lands shall be sold at prices to be fixed from time to time by the Governor in Council, but in no case at a rate of less than one dollar per acre.

"(*d.*) That the proceeds of such sales, after deducting the cost of survey and management, shall be devoted exclusively to the purpose of defraying the cost of the construction of the Canadian Pacific Railway.

The resolution was read a second time, and the question having been put:

Mr. Blake moved an amendment to the effect that the sales of railway lands shall be on conditions of actual settlement, which was negatived on division.

The main question then passed in the affirmative.

On the 6th of May, 1880, on the motion of Sir Charles Tupper, seconded by Sir John Macdonald, it was resolved that this House do approve of the contract for the construction of one hundred miles of that portion of the Canadian Pacific Railway commencing at the end of the 48th contract, near the western boundary of Manitoba, and extending to a point on the west side of the valley of Bird Tail Creek, which contract was laid on the table of the House on the 3rd instant.

On the 7th of May, 1880, assent was given to an "Act to amend the Acts respecting the Canada Central Railway Company," by which the time fixed for the completion of the Railway was extended, and additional powers given and provisions made by which other lines and the Government have running powers over the Canada Central.

On the same day, assent was given to "An Act to ratify and confirm a certain agreement therein mentioned, between the Government of Canada and the Canada Central Railway Company." The Company, by an Order in Council passed under authority of the Act of 1874, and ratified by a resolution of the House, were entitled to receive from the Government of Canada a subsidy of $12,000 per mile, upon the extension of their line westward, to such point as might be selected by the Government as the terminus of the Canadian Pacific Railway, near Lake Nipissing. By the said Order it was provided that, the Company should have the option of substituting the payment by the Government of the interest, or part of the interest on the bonds of the Company running over such term of

years as might be approved by the Governor in Council, in lieu of the mileage subsidy. The Government agreed to assume the payment of the interest (but only until the maturity of the principal) on an issue of bonds amounting to £500,000, payable in twenty years, upon condition among other things that the sum of $1,527,085.50 should be deposited by the Company with the Government, to be held as security for the due completion of their line, subject to certain terms and conditions, amongst these being the granting of running powers to certain lines mentioned.

The expenditure for the year ending 30th of June, 1880, was $4,044,522.72, the amount authorized being $6,910,000.

N. FLOOD DAVIN.

On the 16th of June, 1880, the following Commission was issued :—

CANADA.

LORNE.

VICTORIA, by the Grace of God, of the United Kingdom of Great Britain and Ireland, Queen, Defender of the Faith, &c., &c.

To all to whom these presents shall come, or whom the same may in any wise concern,—

GREETING.

Whereas, it appears from a Report of our Minister of Railways and Canals of Canada, bearing date on or about the 20th day of May, in the year of Our Lord one thousand eight hundred and eighty, among other things that an expenditure has been incurred from the month of April in the year of Our Lord one thousand eight hundred and seventy-one, down to the thirty-first day of December in the year of Our Lord one thousand eight hundred and seventy-nine, and charged to the account of the Canadian Pacific Railway, amounting to the sum of fourten millions two hundred and eighty-seven thousand eight hundred and twenty-four dollars. That two changes in the Government of Canada have taken place during that period; that important questions have arisen and become the subject of discussion, both in and out of the Parliament of Canada, touching the propriety of and responsibility for, large expenditures connected with this work. That allegations have been made as to divers irregularities and extravagancies, neglects and other derelictions of duty on the part of the officers and others employed in the said work, and that sundry irregularities and improprieties have taken place in the obtaining of contracts for portions of said work and in the performance of the same;

And whereas, We deem it expedient in the interest of and as connected with the good government of Canada, to cause enquiry to be made into and concerning all the facts connected with such work, and the conduct and prosecution thereof from its inception to the present time;

Now know ye, that we, by and with the advice of Our Privy Council for Canada, do by these presents nominate, constitute and appoint George M. Clark, Esquire, Junior Judge of the united counties of Northumberland and Durham, Samuel Keefer, Esquire, Civil Engineer, and Edward Miall, Esquire, junior, Assistant Commissioner, Inland Revenue Department Commissioners to make enquiry into and concerning all the facts connected with and the conduct and prosecution of the Canadian Pacific Railway from its inception to the present time. And we do hereby authorize and require them to report fully, from time to time, all matters that they may think it right and proper for them to report under their Commission, and especially their conclusions as to the mode in which such work has been carried on, both from an engineering and financial point of view, and the proper discharge of their duties by all officials and others in relation to the said railway; and also as to the manner in which all contracts have been obtained and executed on the said work, and as to the payments made for and in respect of said work.

And We do hereby, under the authority of an Act of the Parliament of Canada, passed in the thirty-first year of Our Reign, chaptered thirty-eight, and intituled: "An Act respecting Inquiries concerning Public Matters," confer upon the said Commissioners the power of summoning before them and party or witnesses, and of requiring them to give evidence on

oath, orally or in writing (or on solemn affirmation, if they be parties entitled to affirm in civil matters), and to produce such documents and things as such Commissioners deem requisite to the full investigation of the matters into which they are appointed to examine And We do order and direct that the said Commissioners report to Our Secretary of State for Canada from time to time, or in one report, as they may think fit, the result of their enquiry.

In testimony whereof We have caused these Our Letters to be made Patent, and the Great Seal of Canada to be hereunto affixed:—Witness Our Right Trusty and Well-beloved Councillor, Sir JOHN DOUGLAS SUTHERLAND CAMPBELL (commonly called The Marquis of Lorne), Knight of Our Most Ancient and Most Noble Order of the Thistle, Knight Grand Cross of Our Most Distinguished Order of Saint Michael and Saint George, Governor-General of Canada and Vice-Admiral of the same.

At Our Government House, in Our City of Ottawa, this Sixteenth day of June, in the Year of Our Lord One thousand eight hundred and eighty, and in the forty-third year of Our Reign.

By Command,

(Signed) J. C. AIKINS,
Secretary of State.
Z. A. LASH,
Deputy Minister of Justice, Canada.

REPORT

OF THE

CANADIAN PACIFIC RAILWAY

ROYAL COMMISSION.

To the Honourable The Secretary of State :—

We, the undersigned, having been appointed by a Royal Commission, dated the 16th of June, 1880, to make enquiry into and concerning all facts connected with, and the conduct and prosecution of, the Canadian Pacific Railway from its inception to that time,—and to report all matters that we might think it right and proper for us to report under our commission, have the honour to report as follows :—

Shortly after the issue of our commission we met at the city of Ottawa, and, preparatory to calling witnesses, took steps to inform ourselves, as well as the material at our command would permit, on the different branches of the subject referred to us.

Our first sitting for the reception of evidence under oath was on the 12th of the following August,—after due notice of the appointment for that purpose had been given in newspapers.

The public was then admitted to the place of hearing and accommodation found for the press reporters. Proceedings were commenced by the Secretary reading the commission, after which the Chairman made the following remarks :—

"The language of the commission just read, and the fact that it was accompanied by no instructions from the Crown, make it apparent that our enquiry is not to be limited to particular transactions. It is evidently intended that we should obtain from reliable data, a general knowledge of the various steps in the progress of the Canadian Pacific Railway, as well as a more thorough insight into all those matters pertaining to it which may seem to us to require explanation.

Having considered the history of this undertaking as it appears upon the published records, we proceed now to call witnesses whose evidence will be given under oath.

Some gentlemen in the interest of newspapers have applied to us at different times to ascertain definitely whether our sittings would be held with open doors. As no decision was arrived at, and as some of these gentlemen are present, it is proper to say that we, the Commissioners, are unanimous in the desire to admit the public to all our hearings, and yet, while there is every reason to suppose that our wish can be gratified, we feel it to be due to ourselves and inseparable from the responsibility which we have assumed, that we should preserve throughout our course an independence of judgment. We cannot consent, therefore, to part with this independence at the outset by laying down a rule of procedure to be followed under all circumstances and at all hazards. In fulfilling the trust committed to us, our main object must be to elicit the whole truth; compared with this the question of open or closed doors becomes insignificant. If, then, it should appear that on any occasion our end will be best attained by delaying the publication of the proceedings, we shall not hesitate for that occasion to conduct them in private.

It is probable that most of the documentary evidence necessary to be laid before us will be found in the control of some one or more of the Departments of Government, and that much of the oral testimony will be given by persons whom we can summon without difficulty. But we do not conceal from ourselves that there may be sources of important information which ought to be open to us, and which we cannot reach without the aid of others—others who will volunteer their assistance.

We are anxious to hear all the evidence that can be properly received, and that can throw light on any part of the subject referred to us, and we shall be glad to receive help from every quarter in prosecuting the investigation upon which we have entered."

We then proceeded to call witnesses, who were sworn according to the practice prevailing in courts of law.

During our investigation we have heard one hundred and seven witnesses, under oath, at different sittings, of which fifty-three were held at Ottawa, and twenty-seven at Winnipeg. The evidence of each witness was recorded by a stenographer, sworn to report it fully and faithfully in the language used.

Our hearings have been held, invariably, with open doors.

The names of the witnesses who were examined are hereto appended. No one failed to appear who was requested or summoned so to do.

In addition to what has been said by witnesses *viva voce*, Mr. Schreiber, Mr. Gamsby and Mr. Nixon have answered, in writing, interrogatories which we submitted to them, respectively; and Mr. Moberly, after being examined by us, as a witness, at Winnipeg, tendered, of his own accord, a supplementary deposition, supported by his oath, before a Commissioner of the Queen's Bench.

All the testimony under oath, except three depositions hereinafter mentioned, but including as well the said interrogatories and answers, and the said deposition of Mr. Moberly, as the evidence of witnesses who appeared before us, is contained in the accompanying volumes I and II.

The three excepted depositions are those of Mr. William Sifton, Mr. Henry W. Wynne and Mr. Albert H. Clark, which were voluntarily forwarded to us by Mr. Henry W. Sifton. As we have had no opportunity of examining these persons we do not treat their depositions as we have the regular evidence, and we place them amongst the exhibits in the appendix.

In addition to the evidence so set out we have availed ourselves of much that is documentary, including plans and printed and written papers put in as exhibits during the examinations of witnesses, as well as copies of correspondence and returns furnished at our instance by the Department of Railways and Canals, and also other documents which before the date of our commission were on record in Departments of the Government.

Of the exhibits, some either in full or to the extent that we considered them material, are set out in the body of this report; others are printed in the appendix; others are submitted herewith in manuscript as we received them.

They are numbered consecutively and in the appendix we furnish a list showing where each exhibit is now to be found.

In taking evidence we were unable to follow any prescribed order, and we called upon each occasion the witness who could be obtained with the greatest convenience.

With a view of making up for this lack of order in the evidence, and for the omission from our report of many facts proved, marginal notes pre-

pared by the Secretary, and an analytical index so arranged as to facilitate as far as possible the search for what has been said on any given matter, have been added to the text of the first two volumes.

In deciding upon the scope of our enquiry, we concluded:

(1.) That it was not our duty to criticise the principles upon which any Government had conducted any part of the public affairs;

(2.) That the action of a Department in carrying out any business matter connected with the Railway was within our cognizance, such action having, in our opinion, the character of detail rather than of principles of administration, and this, whether the action was that of the Minister or of subordinates or of the Minister and subordinates in concert;

(3.) That we should enquire into the dealings and conduct of all other Government employes and of private individuals so far, and so far only as they were connected with any matter pertaining to the Canadian Pacific Railway.

We consider that for the purposes of the Commission, the proof of each fact and the relation to the railway of the persons concerned in it, would have been as serviceable without as with the respective names of such persons. The nature of the case, however, as well as the publicity with which our proceedings have been conducted, leave us no alternative but to record all that has been given in evidence.

It is obvious that in the progress of this undertaking some of the steps would be of such a character as might be the subject either of a Government policy or an Engineer's judgment. When taken entirely on the responsibility of the officer, we have felt at liberty to enquire into the grounds of such action.

Some witnesses, for the purpose of corroborating their statements concerning matters in which there was a public interest, have, at their own instance, introduced testimony in regard to other matters not entirely relevant, and which we would not have called for, but as it was submitted in support of assertions on subjects within the scope of our enquiry, we have not hesitated to test the strength of such support by cross-examination.

Persons having money demands against the Government on matters connected with this railway have sometimes been permitted to show the circumstances on which such claims are based—not that we might pass on

the validity of the demand, for the respective claimants were generally informed that we did not propose to adjudge between them and the Government, but we allowed the witnesses, on these claims, to tell their stories with some latitude for the reason that in recounting all the facts they could not fail to afford us some information upon the manner in which the Government officials had been managing the railway affairs.

We have held the opinion that when private rights were not infringed it was better to err, if at all, on the side receiving more testimony than might be necessary, rather than too little.

We concluded that we were not desired to report upon matters which are patent on the journals of Parliament, such as messages, statutes, votes and resolutions, and we have made but few allusions to such subjects.

In order, however, that some account of them may be near at hand as a help to our report, we have requested the Secretary of the Commission to prepare a summary of those proceedings, which appears as an introduction.

Surveys.

On the 20th July, 1871, British Columbia became a part of the Dominion of Canada. By the terms of Union the Government of the Dominion undertook amongst other things to secure the commencement, simultaneously, within two years from the date of the Union, of the construction of a railway from the Pacific towards the Rocky Mountains, and from such point as might be selected east of the Rocky Mountains towards the Pacific, to connect the sea-board of British Columbia with the railway system of Canada; and further, to secure the completion of such railway within ten years from the date of the Union.

In April, 1871, Mr. Sandford Fleming was appointed by Order in Council, Chief Engineer of the Canadian Pacific Railway.

No instructions but verbal ones accompanied the communication of this order, and he testified that he understood the instructions to involve, with a view of carrying out the terms with British Columbia—directions, "first, to find if a railway was practicable between the seat of Government and the Pacific coast, and, second, where the best route could be had." Within these limits his liberty of action appears to have been unrestricted; not even the termini were fixed.

Mr. Fleming describes the first three years as having been taken up exclusively with surveys, and inasmuch as the succeeding three years were marked by their own distinctive characteristics, it has been thought desirable to deal with the subject of engineering in triennial periods.

From the beginning ample means were placed at the disposal of the Chief Engineer to meet all such expenditure as would be incurred in carrying out his wide instructions.

The first duty of the Engineering Department would naturally be to ascertain such facts concerning the country as were then unknown, and as were necessary to be ascertained, before deciding on the feasibility and location of a Railway; and in order to understand what had to be done, it is material to see what had been ascertained in that direction, and what assistance could be received from authentic information already at command.

The country through which the line must pass was for the most part, if not altogether, unsurveyed, but it was not entirely unknown. On the contrary, much information of a reliable character respecting it was at that early period available. Several generations had passed away since the Hudson Bay Company's posts had been established at the more important points throughout this vast territory and, in carrying on the business of their fur trade, constant communication had been kept up between their several posts by their officers and servants, along familiar land trails, and lines of water travel. The nature of the country, therefore, became well known to them, and although it was not the policy of the Company to make the outer world aware of the true character of the vast area over which their operations extended, their officers were generally ready to give information and to grant assistance to scientific travellers and explorers especially to such as bore Her Majesty's Commission.

Much, too, had been accomplished through the provident foresight of the British and Canadian Governments towards gaining a fair knowledge of its physicial features. The Admiralty surveys of the great lakes furnished the outlines of the coasts of the Georgian Bay, Lake Huron and Lake Superior, and showed the positions of the bays and mouths of rivers available for harbours along their shores. The Admiralty charts of the Pacific coast likewise gave the position and other particulars relating to the islands, straits, inlets and harbours of British Columbia, and, as concerning the vast extent of country lying between Lake Superior and the Pacific, a large amount of valuable information had been obtained by the explorations of Captain Palliser and his assistants, under the authority of the British Government in the years 1857 to 1860, as given in his report laid before Parliament and published in 1863. On the face of the carefully compiled map which accompanies that report were represented the woodland, the mountain and the prairie regions, and their respective boundaries as well as the mountain passes, the lakes and courses of rivers and trails, and the various lines traversed by the officers of his command, together with notes on the soil, climate and the products of the country. The geological formations were also indicated, and the elevation of the great plains and terraces, as well as that of many of the passes through the Rocky Mountains. Respecting these passes, however, Captain Palliser's examinations were confined by his instructions to the area bounded on the north by Mount Brown near the Boat Encampment at the bend of the Columbia River, and on the south by the international boundary line. The

discovery of Yellow Head Pass, which was some sixty miles north of the Boat Encampment, was therefore impossible to him unless he exceeded his instructions. However, when Dr. Hector, the Geologist of the expedition, penetrated the main chain of the Rocky Mountains as far as Henry House, a post of the Hudson's Bay Company, located near that pass, the discovery was all but made, and, in fact, though not examined, the pass itself is marked upon Captain Palliser's map as the "Leather Pass."

The labours also of Mr. Alfred Waddington in connection with his project for a Pacific Railway, are acknowledged by Mr. Marcus Smith as having been of great service in the prosecution of the British Columbia surveys. In his "Overland Route through British North America," published in 1868, he remarks on the various Rocky Mountain Passes, and gives a table, here reproduced, of the different passes which had been explored on British Territory; leaving out the Athabaska Pass by Peace River, in lat. 56° 28', as being too far north for the purposes he had in view:

Names of the Passes.	Ridge or Divide.		
	Lat.	Long.	Alt.
	Deg.	Deg.	Feet.
1. Yellow Head Pass, from the Athabaska to the Upper Fraser.	52·54	118·33	3,760
2. Howse Pass, from Deer River by Blaeberry River to the Upper Columbia	51·57	117·07	6,347
3. Kicking Horse Pass, by Bow River and Kicking Horse River, to the Upper Columbia, Sullivan	51·16	116·32	5,420
4. Vermillion Pass, from the South Saskatchewan by Fort Bow (4,100 feet) to the Kootanie, Hector	51·06	116·15	4,947
5. Kananaski Pass, from Fort Bow by Ramsay River to the Kootanie (with a short tunnel 4,600 feet), Palliser	50·45	115 31	5,985
6. Crow's Nest Pass, by Crow River to the Kootanie	49·38	114·48	
7. British Kootanie Pass, by Railway River to the Kootanie, Blakiston	49·27	114·57	5,960
8. Redstone Creek or Boundary Pass, from Waterton River to the Kootanie, (partly on American ground) Blakiston	49 06	114·14	6,030

Mr. Waddington then proceeds to discuss the relative merits of the different passes, concluding that "there could be no hesitation in regarding the Yellow Head Pass through the Rocky Mountains, with its easy gradients and low elevation, as the only feasible one for a railroad."

During the year, 1857 and 1858 other exploring expeditions were despatched by Canada to the Red River, the Assineboine and the Saskatchewan; reports of which were published by authority of Parliament, and

also in 1860 by Mr. Hind, who took part in these explorations. His work is liberally illustrated by sketches, views, maps and sections.

The published reports of Mr. Dawson and the surveys of the Dawson route between Lake Superior and Red River, were also available. Of the character of the remaining portion of the couutry—that lying between Ottawa and Lake Superior—some information had been obtained by the surveys for the Ottawa Canal, of which the first was conducted by Mr. Walter Shanly and reported upon by him in 1858, and the second by Mr. T. C. Clark and reported on in 1860. More recent land surveys had been made by the Province of Ontario along the Georgian Bay and the north shore of Lake Huron as far as Sault Ste. Marie. The geological survey conducted by Sir Wm. Logan, with the maps accompanying his reports, embracing the whole country from the Atlantic seaboard to the Red River, also supplied much valuable information.

Besides these official explorations and surveys, other information of a general character relating to the climate and the conditions of the North-West Territories could be gathered from the published accounts of travellers through that region, such as Lord Milton and Dr. Cheadle in 1864, and several others who had made extended explorations.

The search for gold in the Gold and Cariboo ranges of British Columbia, unveiling as it did many of the physical features of the country, Mr. Trutch's map of 1871 giving the coast line, mountain ranges, roads, lakes and rivers of that colony, or the surveys upon which it was based,—all these sources of information were available before the commencement of the survey.

On the 5th May, 1871, Mr. Jas. H. Rowan, then an officer of the Government in the Public Works Department, was appointed, with the acquiescence of Mr. Fleming, as his chief assistant.

Mr. Rowan states in evidence that from that date until about the 10th June, he was engaged in collecting all the information that it was possible to obtain with reference to the country between Ottawa and the Rocky Mountains; that he made a digest of all the information so obtained and sketched an outline of the manner in which he thought it would be desirable to carry on the surveys This report, having been considered by the Chief Engineer and certain alterations made, he says, the work was organized, and about the 10th June he (Mr. Rowan) set out with some thirteen parties of surveyors who were to be started from various points

between the Ottawa Valley and Red River, it being expected that each party would make a survey of about seventy-five miles per season.

About the same time Messrs John Trutch, R. McLennan and Walter Moberly were appointed to examine the country lying between the Rocky Mountains and the Pacific,—each of these gentlemen being in charge of two parties, while Mr. Frank Moberly was instructed to examine the prairie region between Fort Garry and the Rocky Mountains—one-half of his party having the Yellow Head Pass, the other half the Howse Pass as its objective point. Some twenty-one parties in all were organized for this work. The aggregate number of men employed during the first season was stated by the Chief Engineer in an official report to have been nearly 800, so that the parties must have averaged not much less than forty men.

The information from the reports of his subordinates, added to that at his command from the then existing literature on the subject, enabled the Chief Engineer, after less than a year's operations, not only to report officially the practicability of the entire route, but also to indicate its general course.

His first special report as Engineer of the Canadian Pacific Railway is dated 10th April, 1872. Before that was written the Yellow Head Pass of the Rocky Mountains was considered to be most eligible, and the facts reported led to an Order in Council dated 2nd April, 1872, by which it was adopted by the Government as the gate to British Columbia from the east.

The result of the first year's surveys are summed up in the official report above referred to as follows:—

"No serious engineering difficulty has been met with in passing from the valley of the Ottawa to the country north of Lake Superior. It is impossible, however, to speak so favourably of the country covered by the divisions G and H, embracing over 100 miles easterly from the River Nipigon. This section is excessively rough and mountainous, and the survey made through it did not result in finding a practicable line for the railway. West from Nipigon River to Fort Garry—although two divisions of the survey are incomplete—enough is now known of the country to warrant the belief that it will admit of a practicable line with favourable grades for the greater part of the distance."

In respect of the line from Sault Ste. Marie towards Lake Nipissing he states that "a good line can be had with very favourable grades;" and with regard to the British Columbia section the following words are made

use of, viz.:—"There will be no difficulty in building a railway with very favourable grades from Tête Jaune Cache to Kamloops. From Kamloops a survey has been made to Burrard's Inlet, except about seventy miles on the extreme western end of the line, and on the latter section, no serious difficulties are believed to exist. The survey shows that a practicable line with favourable grades may be had, although the cost, particularly along the canons of the Lower Fraser River, will be considerably above an average."

The map accompanying this report of 1872, shows his projected line as follows:—"From Ottawa to the Red River, the line runs to the north of Lake Nipissing, thence to the south of Lake Nipigon, and after touching the north shore of Lake Superior, crosses the Red River between Fort Garry and Lake Winnipeg, after which it passes to the south side of Lake Manitoba, then over the great fertile plain to the Rocky Mountains, through the Yellow Head Pass, and down the north Thompson and the Fraser Rivers to Burrard Inlet on the Pacific Coast." There is also given a connected profile of the whole line from Ottawa to the Pacific Coast, which is placed in contrast with the railway line from New York to San Francisco, by the Union and Central Pacific Railway, as follows:—

	Distance in miles.	Elevation in feet.
New York to San Francisco	3,363	8,242
Montreal to Burrard Inlet	2,730	3,760
Difference	633	4,482

No location surveys were attempted at this early date, but it is a noticeable fact that, though some of the instrumental surveying parties—which were considered by the Chief Engineer to be indispensable—failed of their object, flying exploratory parties succeeded in obtaining the lacking data, so that a line was laid down upon the map accompanying this report, corresponding very closely with that which, after some years of persistent effort to find a better, has been finally adopted for location.

This is especially the case in respect of British Columbia, while as respects the prairie region, the location subsequently made north of Lake Manitoba, upon which the telegraph line was actually constructed, has been since abandoned in favour of the line on the south side of that lake, in the neighbourhood of that originally projected as the result of the first year's surveys.

It has before been stated that about the 10th of June, 1871, some thirteen parties left Ottawa, under the general direction of Mr. Rowan, to conduct the surveys from the Ottawa Valley to Fort Garry.

A more detailed account of the operations of these parties, as well as those in subsequent years, is to be found at the end of that portion of our report bearing upon Engineering.

A synopsis in tabulated form showing how all the parties were distributed as to districts, is also there given.

These parties had for their object to ascertain the practicability of a line from the Ottawa to the Red River, touching at some point suitable for a harbour on the north shore of Lake Superior. Many of the officers engaged upon these surveys, as well as those operating west of the Rocky Mountains, have given their evidence before us, and such of it as portrays any specific features calling for special remark is hereinafter dealt with.

Some of these parties continued in camp throughout the winter. Many difficulties were met with and great hardships endured, partly on account of the burning of the forest, by which several lives were unfortunately lost, and partly on account of insufficient commissariat arrangements.

The work of supplying several hundred men at various points along a line of some hundreds of miles of unfamiliar country, is admittedly one requiring more than ordinary organizing ability. In undertaking a work so extensive as that which was imposed upon the Chief Engineer, the selection of suitable men for the work should have been a matter of very serious deliberation.

Whether it was so or not, the arrangements made for the distribution of supplies to the parties operating east of Fort Garry appear to have been lamentably defective, resulting, in some instances, in great individual hardships, and, in many cases, in serious delays in the prosecution of the work, and consequently loss to the publicc revenue.

Mr. Carre states that soon after their first arrival at Thunder Bay, Mr. Rowan started two parties under Mr. John Fleming and himself (Carre) for Lac des Isles, from which point one party was to work easterly, and the other westerly. They were provided with what Mr. Rowan considered to be sufficient supplies for a month. During their journey, *en route* to the starting point of their intended operations, they began to question the adequacy of supplies, and came to the conclusion that when they arrived

there they "would have to turn back with all hands and get provisions." Fleming's party, therefore, returned to Thunder Bay, and the other one appropriating the supplies intended for both, proceeded to Lac des Isles. Notwithstanding this precaution, their provisions ran out one week after they reached that point. Fresh supplies were forwarded; but on the 15th October, although full information had been sent to Thunder Bay as to their requirements, they again failed; and the party had to abandon the field and return to headquarters. His men refused to go back, and he was compelled to hire a new party.

Mr. Carre estimated the direct loss in wages, paid to the men while not at work, at about $3,840. There is little doubt, however, that including the provisioning of the party, the cost of this misadventure could not have been less than $8,000.

Mr. Kirkpatrick, who was, in 1871, a transit-man, attached to party G, also gave evidence as to repeated delays from similar causes. At one time he had to employ a party of forty to forty-five men in making snowshoes and toboggans, in view of the approach of winter; these necessary articles not having been provided by those whose duty it was to do so. On another occasion, constant and repeated delays in provisioning the party induced the Engineer to make a written complaint—in reply to which the Commissariat Officer wrote back stating, "that if God spared his life, and "the mosquitoes were not too bad, he would supply them better in "future."

These cases are cited as typical of others which will be found recorded in the evidence, and we are forced to the conclusion that there was a great want of business capacity in the management of this branch of the undertaking, which is the more to be deplored, inasmuch as every day lost to each party's effective energy, involved a pecuniary loss of from $100 to $120.

The only operations in the prairie region during 1871 were those under Mr. Frank Moberly before mentioned.

Some description of the physical features of the Mountain Region is, perhaps, necessary to a proper understanding of the operations carried on therein, and a just appreciation of the importance of the results achieved.

The coast line of British Columbia extends from the 123rd degree of west longitude on the international boundary (latitude 49°) to the 130th

degree, west longitude, on the 55th parallel, which approximately marks the most southerly part of Alaska in contiguity with British territory.

Its general trend is from south-east to north-west.

Parallel with its coast line the Cascades form an almost impenetrable belt of mountains, extending from the confines of Alaska on the north to the southernmost boundary of the province.

At intervals of from fifty to one hundred miles (and sometimes less) along the whole extent of the coast line, deep arms of the sea run inland in mountain gorges, some of them for a distance of sixty or seventy miles.

On the eastern frontier of the province, the Rocky Mountains lie in about the same general direction from 120° west longitude, at the northern extremity, to 114° where they intersect the United States boundary.

The "Rockies" are flanked on the west by several other ranges of comparatively short length, the most important of which, viz., the Cariboo, the Gold or Columbia and the Selkirk ranges, extend in the order named from north-west to south-east, almost parallel with the general course of the Rocky Mountains.

The Selkirk, the most easterly of these smaller ranges, is almost entirely embraced by the River Columbia, which takes its rise on the western slopes of the Rocky Mountains near latitude 50°, and, after running northwesterly for nearly two hundred miles to a point known as "the Boat Encampment," abruptly turns to the south and pours its waters, through the United States territory, into the Pacific.

From the western bend of the Columbia River – on its southward course as above described rise, more or less abruptly, the next of the said smaller range of mountains known as the Gold or Columbia range, extending from the southern boundary of the province up to Yellow Head Pass.

This famous pass is situated directly north of the Boat Encampment, at the bend of the Columbia, and distant from it some sixty miles, be it more or less. In this neighbourhood the Thompson and Fraser Rivers take their rise.

The Thompson River runs for about 100 miles due south, and is then turned in a south-westerly direction by the foothills of the Columbia range, which widens out as it trends southward, until its mountains become merged into the Cascades, upon the United States boundary.

The Fraser River, like the Columbia, runs for some 200 miles in a north-westerly direction until, in the vicinity of Fort George, it too turns abruptly south, and after traversing some five degress of latitude and receiving into its bosom the waters of the Thompson, it enters the Straits of Georgia at about the same longitude as that of Fort George.

Within the northern bend of this magnificent river, the Cariboo Mountains form an almost unbroken range.

West of these subsidiary ranges and between them and the Cascades on the Pacific Coast, is an elevated plateau, more or less mountainous, but level as compared with the country which we have been describing.

The first efforts of the engineering staff in this portion of the country were naturally directed to the discovery of a pass in the Rocky Mountains, through which the construction of a railway would be practicable, and from which a route through the inferior mountain chains might be had to the central plateau above referred to. The Yellow Head and Howse Passes were selected as the two which were most likely to prove available, and six parties were organized in the summer of 1871 with a view to test their relative claims to adoption.

The general position of the first has already been described. The lower end of Moose Lake, which marks the westerly limits of the pass, is almost exactly in 53° north latitude and 119° west longitude.

The Howse Pass is some 120 miles further south. This depression in the Rocky Mountain chain occurs near the sources of the North Saskatchewan. A direct south-westerly line from Howse Pass to Burrard Inlet would, immediately upon leaving the Rocky Mountains, at this point, cross the Columbia River on its north-westerly course, and striking across the Selkirk Range for some fifty miles, would again encounter it on its southerly route towards the Pacific. This imaginary line would be the base of a triangle whose two sides would be formed by the course of the river, and whose apex would be the point previously referred to as the Boat Encampment, distant from Howse Pass some eighty miles. After crossing the Columbia the second time, which it would do at a place called Big Eddy, the line would run through a depression in the Columbia range *viâ* Eagle Pass to Shuswap Lake. From that point a broken and rocky country extends to the valley of the Lower Fraser. If, however, instead of continuing in the same south-westerly line from Shuswap Lake—the western side of the lake being gained—the course should be diverted

in a direction somewhat more westerly, a valley would be struck through which the waters of the lake find their way to Kamloops where the North Thompson joins the main stream. From this point the Thompson and the Lower Fraser flow in a zigzag but generally south-westerly course, until their waters are emptied into the Straits of Georgia at Burrard Inlet.

It has been stated that six parties were organized in 1871 to operate in this region.

Two of these parties were placed under the direction of Mr. John Trutch, with instructions to survey from the mouth of the Fraser to Lytton, and thence *viâ* Kamloops and the Thompson River to Shuswap Lake; this distance being the westernmost section of the route from Howse Pass to Burrard Inlet, just described.

Two more were placed under Mr. Walter Moberly; the one to take up the line of Mr. Trutch's operations, and to extend it easterly by exploring the country from Shuswap Lake through the Eagle Pass, as far as Big Eddy, a point on the Columbia River, on the west side of Selkirk range. For the time being, no effort was to be made to pierce the Selkirk range; but the other party under Mr. Moberly's control was instructed to strike across the country from Hope (on the Lower Fraser), in an easterly direction, to Wild Horse Creek, a little to the south of the head waters of the Columbia River, and thence to follow the course of that river upon its eastern bank to a point about the latitude of Howse Pass.

From this point they were to survey easterly through Howse Pass; and after reaching the summit, to descend the eastern slopes of the Rocky Mountains, to connect with Mr. Frank Moberly's party on the Kootanie Plains.

Had the Howse Pass proved to be a more favourable one than its rival, the Yellow Head, persistent efforts would, doubtless, have been made to find some available route through the Selkirk range, to connect the two lines, which Mr. Moberly's parties were, at this period, surveying.

An extension of the line projected by the party, whose proposed operations we have just been considering, westerly through the Selkirk Mountains to Big Eddy would have completed a chain of surveys from the head waters of the Saskatchewan to Kamloops, and thence *viâ* the Thompson and Lower Fraser to Burrard Inlet, by a route as direct as the most sanguine might hope to obtain, through so mountainous a region as that which this province presents.

Apart, however, from the probability of finding a favourable line through the Selkirk range, it was known that from Big Eddy the Columbia River might be followed, around the bend, *viâ* the Boat Encampment to the vicinity of the Howse Pass; and the line so obtained, though probably one hundred miles longer than if carried through the Selkirk, would still compare favourably, in point of distance, with that *viâ* Yellow Head Pass and the North Thompson River.

The remaining two parties did not branch off easterly from Kamloops, as did those of Mr. Moberly, but proceeded from that point, under charge of Mr. R. McLennan, in a northerly direction—the one to make its way through the Cariboo range with a view to find some available line from the neighbourhood of the Upper Fraser River to that of Tête Jaune Cache *en route* to Yellow Head Pass; the other to follow the valley of the North Thompson to the Yellow Head Pass, and there to examine its capabilities.

Mr. Walter Moberly and Mr. R. McLennan, who directed the operations of four out of the six parties engaged upon the British Columbia surveys during 1871, have both given evidence before us.

In our judgment the method adopted at the outset for the examination of the country was one which involved larger parties and a greater expenditure than the circumstances justified, and inasmuch as the evidence of these gentlemen describes the operations of their several parties as circumstantially as could be desired, we think it is well to report more fully than we should otherwise do as to the size, equipment and progress of these parties, with the view of illustrating some features of a system which we consider objectionable.

In order to measure the necessity for such large parties and for preparations so extensive as their organization and supply called forth, it is necessary to keep in mind their respective objects and destinations.

The two parties under Mr. Moberly were organized to ascertain the practicability, through a comparatively unknown country, of two links of a prospective route for a railway, between Kamloops and the plains east of the Rocky Mountains.

Party T was to examine one portion of the route, viz.: From Shuswap Lake to Big Eddy, west of the Selkirk range. The other, party S, to take up the same line—but beginning on the opposite side of the Selkirk range—and to proceed through the Howse Pass to the eastern side of the Rocky Mountains.

Party S had from eighty to ninety animals (*i.e.*, horses and mules) and about twenty-four men besides packers---the latter would number about ten for this sized party--so that the party in all, including a commissariat officer, would not have numbered less than thirty-five. Of these, beyond the staff, some were axemen who were paid $40, and some packmen whose wages ranged from $50 to $90 per month, all provisioned at the Government expense.

The party was organized at Victoria; was conveyed by steamer to Hope, and, accompanied by some eighty or ninety horses and mules, had to make their way several hundred miles to the point at which the survey was to begin.

Leaving Hope the first week in August, they did not reach Wild Horse Creek (near the source of the Columbia River) till some time in September. From that point to Howse Pass it became necessary to make a trail to get in their supplies; and they did not reach the point at which it was designed their suryeying operations should commence until the 2nd of October.

Mr. Moberly did not accompany his party to Wild Horse Creek, having had to take the route *viâ* Colville, a point south of the United States boundary line, in order to purchase further supplies, and make arrangements for their transport.

Notwithstanding this long detour, however, he reached Howse Pass in advance of his party. Unaccompanied by them, and attended only by three or four Indians, he went through the pass and descended the easterly slopes of the Rocky Mountains.

On his return to the western side of the Mountains he found his party had reached the scene of intended operations.

A depot was built; and his party having opened a trail by the Blaeberry River to the summit of the pass, a distance of some thirty-seven miles. they were forced at the beginning of November to suspend operations and go into winter quarters.

Mr. Moberly, with one of his party and six Indians, returned to Victoria, taking with him, for transmission to Ottawa, the data which had been obtained. They accomplished the journey, upon snowshoes, in fifty-four days; and it was during this journey that he ascertained, by simple observation, the impracticability of the route from the Columbia River depot westerly through the Selkirk Range.

Mr. Moberly stated, in evidence, that the amount expended by him from the 20th July, 1871, to the end of the year, reached $57,000, which covered the requirements of his party through the winter.

Party T consisted of about twenty-two men; they had neither packers nor animals.

This party was instructed to run a line through Eagle Pass. Having proceeded from Yale to Kamloops, by the usual method of travel, they were conveyed thence to the neighborhood of the pass by batteaux.

From this point they started their exploration eastward. They surveyed some forty-four miles, as far as Big Eddy, on the Columbia River, where they wintered.

Supplies for party T had been purchased by Mr. Moberly; and had accompanied the party as far as Eagle Pass, where they had been cached. The scarcity of Indians to pack them had made their transportation to that point—beyond navigation—very expensive. Mr. Moberly states the transport to have cost, on a rough calculation, 80 cents per pound from Kamloops to the depot, half-way through Eagle Pass; while the transport from Colville to Big Eddy, the eastern terminus of the survey, cost only from five to six cents per pound.

The parties under the charge of Mr. R. McLennan, each numbered about forty, of whom all but five were labourers.

The party (Q) were directly under his control; left Kamloops early in August, under instructions to proceed, in as direct a route as possible, to Yellow Head Pass, and to survey thence westerly to Tête Jaune Cache, at which point it was expected the other party (R) which was to operate in the Cariboo district (if successful in piercing that range from the valley of the Frazer) would meet them.

Party (Q) was accompanied by some forty animals.

They reached Cranberry Lake, which Mr. McLennan states to be about 200 miles north of Kamloops, and distant some fifty miles from Yellow Head about the 5th of October.

At this point, winter threatening to close in, he thought it prudent to reduce his party so as to have no more than could subsist well till spring upon the supplies they had with them. All the packers and nearly all the animals were therefore despatched to Kamloops. This done, a party of twelve or fourteen were left at Cranberry Lake to survey that part of the

route, and continue examinations during the winter, while Mr. McLennan accompanied by Mr. Selwyn (Director of the Geological Survey), and four men, went on to Yellow Head.

This small exploring party, six in all, accompanied by about the same number of animals, left Cranberry Lake about the 18th of October, and penetrated the pass to within about ten miles of the summit level, when on the 26th of that month a severe snow storm warned them to retrace their steps. Mr. McLennan reached Cranberry Lake, on the return journey, about the 1st of November, and leaving his party there, he made his way back *via* Kamloops to Victoria, and thence returned to Ottawa to communicate the results of his explorations. We have already stated that the impracticability of the Selkirk Range was discovered by Mr. Moberly, unaccompanied by his party, while on his return journey to Victoria. By Mr. McLennan's evidence, it will be seen that the crucial question as to the capabilities of Yellow Head Pass, was determined likewise by a bare exploration. And yet the information obtained was so convincing that without waiting further surveys the Yellow Head Pass was adopted and the Howse Pass abandoned.

Many engineers have been examined by us upon the expediency of commencing the examination of an unsurveyed country with the view to building a railway over it, by simple explorations rather than by instrumental surveys. All of them, not excepting Mr. Fleming himself, agree in the view that under ordinary circumstances, the instrumental examination ought to be deferred until after the preliminary track surveys had shown, in what localities the closer and more expensive surveys should take place. All excepting Mr. Fleming and Mr. Rowan state that in the case of the Canadian Pacific Railway the ordinary rule ought to have been followed. Mr. Fleming and Mr. Rowan testified that the case of this railway was an exceptional one, and that under the circumstances it was expedient to depart from the ordinary rule, and to begin by the more exact and more expensive system.

Mr. Fleming said that if time had not been limited he would have taken a course entirely different from that which was adopted. He would have had explorations made—a reconnaissance of the whole country before employing expensive parties to make instrumental surveys; that that system would undoubtedly have been the best to adopt, because it "would have saved a lot of money"; that the explorations would have given a general

idea of the country, and would have shown where it was justifiable to incur the expense of an instrumental survey, and that this would have been a great advantage. He also said that if the time had been much longer than two years he would. north and west of Lake Superior. have taken a different course, namely, to examine simply by micrometer and barometer for the purpose of getting a general, though not strictly accurate knowledge of the country, because this would have enabled him to project the more expensive instrumental surveys on routes which were most promising.

Again, Mr. Fleming said that if time was not an element—for instance, if ten years had been available instead of two, he would have sent exploring parties up the River Ottawa to make a micrometrical and barometric observation. and the same up other rivers, and in that way endeavoured to narrow the limits within which to make the kind of surveys which were made.

In this case the system adopted from the beginning for the examination of the country was generally an instrumental survey, *i.e.*, a continuous chain of instrumental measurements upon a line over which levels were taken; "the engineer endeavoring to follow a tract of country through which a railway route had subsequently to be laid out".

This is apparent from the evidence of Mr. Fleming and Mr. Rowan, as well as from the fact that the instructions issued by the Chief Engineer to his staff, and dated 24th May, 1871, contained no directions for independent exploring parties; they provided for examinations of that character only when made in connection with the instrumental force.

The evidence leads us to believe that, in devising the system for the first examination of the country, simple explorations were so completely ignored, that the cost of them as compared with instrumental examinations, was not seriously considered or discussed.

Mr. Fleming and Mr. Rowan were both examined concerning the cost of track surveys. Mr. Fleming did not remember that calculations upon that subject had ever been made by him. Mr. Rowan had not any settled opinion as to the size of parties necessary to carry out a simple exploration, in the country which had been under his charge. He seemed to think, moreover, that they would have been useless as independent expeditions.

Under these circumstances, it became our duty to investigate carefully the reasons why the course which is, in the profession of engineers, under-

stood to be one followed under ordinary circumstances, was, in this particular case, departed from, and a system which is admitted by the Chief Engineer to be more expensive adopted in its stead.

Mr. Fleming said that because of the limited time within which this railway was then expected to be commenced, it was expedient to treat the case exceptionally; and under the circumstances he considered it advisable to begin by making instrumental examinations, generally.

We endeavoured to ascertain Mr. Fleming's reasons for saying that the shortness of the time within which the road was expected by him to be commenced, made it necessary to depart from what he understood to be the best method when time was not limited. He said, "it was necessary to ascertain whether a line from end to end of the country was practicable or not, before a blow was struck", meaning, as we understood him, that a continuous line should be accurately described from instrumental data before a decision could be arrived at on the vital question—could a railway be built.

We have taken occasion while examining those engaged upon these surveys, especially such as have been deemed to be men of professional acquirements, to request from them an expression of opinion on this point.

Mr. Marcus Smith says: "I think I should have preferred to have thoroughly examined the country, and almost decided upon the line or lines before I made the instrumental surveys;" and, referring to Mr. Moberly's survey of the Howse Pass, he expresses his belief that the comparative advantages of the different passes might have been ascertained by parties of ten, instead of the much larger parties which were actually engaged upon the Howse Pass explorations. Referring to that expedition he says: "I think it was premature going into such expensive surveys as he did."

In a letter addressed by Mr. Marcus Smith to the Chief Engineer in 1872, which was produced in evidence, the following passage occurs: "It is impossible now for me to reduce the expenses very materially as all the parties are in the field at a great distance, and a mistake was made at first in placing large surveying parties in the field. They ought to have been simply exploring parties, each consisting of two thoroughly competent engineers, each having a mountain barometer, compass and tape line, and a few guides and horses, altogether not more than one-fourth of the size of the present parties, as these could have made surveys, if done with

judgment, sufficiently close to determine the general route of the railway, which would have left only one line, with minor deviations, to be surveyed or located."

Similar opinions were expressed by Mr. Moberly, who stated that, in organizing the party as he did, he simply carried out instructions received from the Chief Engineer.

Mr. McLennan states: "I have always maintained it would have been better to have explored for two or three desired or desirable points before making instrumental surveys at all. A few men with Indians can get through a country well, for the Indians, as a rule, are very good packers, but when you get a large party for an instrumental survey, that you have to fit out for surveying, you increase the weight of the whole expedition, that is, without knowing you can get a line through at all, you simply get routes without a certainty they will even be utilized."

Mr. Fleming in describing the effect of the two systems, said that the loss, if any, by that which was adopted, was a financial loss, and that the only gain by the other would be that it "would be more likely to meet with ultimate success."

He testified, moreover, that it happened in various localities, that the instrumental examinations were sometimes of no avail, because obstacles were met which might have been discovered by simple exploration; that these localities were principally north of Lake Superior, and in British Columbia; that, however, some of the obstacles met with, were not such as would have been discovered by simple explorations; and that in some portions of the country, even if time had not been limited, it would have been advisable to begin the examination by instrumental surveys.

We understand from Mr. Fleming's evidence that this exceptional country was at the eastern end of the proposed line, "more especially from Nipissing to the Ottawa," and somewhat further west for a considerable portion of the distance to Lake Nipigon.

It is proved beyond doubt, as before pointed out, that on the first year's examination of British Columbia, the crucial question of "a gate" through the Rocky Mountains, involving as it did the choice between two rival passes, was made and settled on from the reports of a flying exploration, showing that an instrumental traverse line was not indispensable even when determining the merits of two rival routes, and if not, all the reason-

ing in the matter appears to us to lead away from the propriety of beginning the examination of the country by large, heavily equipped and slow moving bodies of surveyors.

But even if a line, ascertained by instruments, were necessary as an antecedent to the first blow, we do not see how instrumental parties from the outset hastened its accomplishment.

It was to be expected, and it happened, that instrumental parties occasionally met such obstacles as to make their labours useless, and to require a fresh instrumental examination of the particular link allotted to them—the obstacles being such as a flying exploration would have discovered. The question of time, therefore, seems to us to assume this shape: does an exploration, followed by an instrumental examination, take more time than two instrumental examinations over the same section of country? It is obvious that this is not the case, and therefore, the shortness of the time relied on by Mr. Fleming, fails to establish, in our judgment, the expediency of the system adopted.

The four expensive parties under Mr. Moberly and Mr. McLennan gave, as a result of their season's operations, no more of the desired knowledge than, in our judgment, might at that time have been expected to be gained from mere exploring parties at a very small proportion of the cost actually incurred.

After questioning Mr. Fleming upon several occasions concerning the comparative cost of a bare exploring party, and one making an instrumental survey, he said he could not give very satisfactory information on the subject: he had found it impracticable to adopt the exploring system and the cost of it was not considered; "it was impracticable," he said, "for more reasons than one. The men that could make a survey of that description (*i.e.*, simple exploration) were not available—they were not to be had in the country."

We think the evidence shows not that such men were not to be had, but that when they were to be had they were employed in preference on instrumental surveys, as in the case of Mr. McLennan and Mr. Moberly, whose services as explorers were nevertheless valuable and decisive.

Mr. Fleming testified that he adopted the operations without any great consideration as to the comparative cost of different kinds of expeditions, the main object was to get the information desired by the Government, and he considered the cost a matter of secondary importance.

After considering the whole evidence on the subject, we have been unable to satisfy ourselves that the necessity under which Mr. Fleming considered himself to lie, to be prepared to commence the construction of the line within two years was a reasonable justification for the immensely increased expenditure due to the course adopted, namely, that of placing in the field, from the inception of the undertaking, fully equipped instrumental surveying parties, instead of preceding such operations by simple explorations.

On the contrary, we feel constrained to say that a different course, namely, postponing, as a rule, the instrumental examination until a simple and less expensive one had shown where the more accurate and more expensive one would be required, was the course which at that time ought to have been considered proper to adopt, and which, if adopted, would have resulted in a very large saving of public money without any actual loss of time in the progress of the undertaking.

During the year 1872, twenty-two parties in all were in the field, irrespective of the trans-continental tour of the Chief Engineer.

Several instrumental parties, each consisting of from thirty-five to forty men, and two small exploratory parties of nine and ten men respectively were operating in the Woodland District.

Their general object appears to have been the discovery of a practicable line north of the more rugged country surveyed during the preceding year, in the pursuance of which Mr. Murdoch has stated in his evidence, that he was instructed to investigate the feasibility of a line from the crossing of Winnipeg River *vid* English River, and thence south of Lac Seul to the head of Nipigon Lake. This route, he states, he found by enquiry to be impracticable, and having discretionary powers, he determined on Rat Portage as an objective point, and explored thence easterly. He adopted the route as laid down on a plan produced by him as an exhibit during his evidence, the original of which he believed to have been burned by the fire which destroyed the Canadian Pacific Railway offices, during the winter of 1873-74. This line is almost identical, as far east as Eagle Lake, with that finally located for construction.

This appears to have confirmed Rat Portage as the governing point between Lake Superior and Red River. Mr. Murdoch's party on this occasion consisted of nine men with dog trains.

From Eagle Lake a line was surveyed by Mr. Jarvis to Sturgeon Lake, and from Sturgeon Lake one in the same general direction was extended by Mr. Keating to the north side of Lake Nipigon.

The remaining surveys, five in number, were made between Nipigon and the Ottawa Valley. In respect of the operations of these parties, Mr. Rowan reports on the 5th June, 1873, as follows :—

"The result of this instrumental survey places beyond a doubt the practicability of constructing a line of railway from the vicinity of Lake Nipissing to Red River, on which neither the amount of excavation and embankment, the bridging, the grades, or the curves will be exceptionally heavy. On that portion of the line between Red River and Lake Superior, I believe it will be possible so to construct the line that no grade exceeding 52·80 feet per mile will be required, and that grades of this inclination will be neither numerous nor of any great length. On that part of the main line between the Nipigon Branch and the eastern terminus, the present approximate section shows a few points where grades of seventy feet to the mile are introduced. I believe, however, that further exploration will enable these difficulties to be avoided, and that throughout the whole district no grade exceeding 52·80 feet per mile will be required, and of these a proportionately small amount."

No engineering operations were carried on in the prairie region during 1872.

In British Columbia eleven distinct surveys, besides an exploration north of the 54th parallel, were made during the year 1872, as follows :—

Mr. Moberly and Mr. Trutch, each having two parties, made a series of surveys from Yellow Head Pass, the whole length of the Thompson Valley to Kamloops.

Mr. McLennan, with two parties, starting from Lake William, near the Fraser, devoted his efforts to the discovery of a feasible line, thence easterly to the Thompson Valley, as an intermediate link in a route from that point towards Bute Inlet.

This general line was continued by parties under Tiedeman and Gamsby, the latter gentleman having made an exploratory survey from Waddington Harbor to Seymour Narrows.

Three other surveys were made south of Kamloops.

Thus it will be seen the whole length of the two alternative lines from Yellow Head to Bute and Burrard Inlets, respectively, were covered by the operations of that year.

During the winter of 1871-72, Mr. Moberly's two parties were encamped, the one at Big Eddy west, and the other at the Columbia River Depôt east, of the Selkirk Range.

While in Victoria, Mr. Moberly having transmitted to Ottawa all the data obtained from the surveys of his parties prior to their going into winter quarters, represented to the Chief Engineer that to complete the work committed to him during the ensuing season, he required the services of a third party; and permission to organize it was granted. This party was intended to be utilized chiefly in trail-making.

As he was on the eve of his return to Howse Pass, he received instructions from Ottawa to abandon his surveys in that district, and to take his party *viâ* Athabaska Pass to Yellow Head, to complete the surveys from Tête Jaune Cache to Edmonton.

Mr. Moberly pointed out the difficulties of the proposed course and endorsed by the Lieutenant-Governor, Mr. Trutch, who was himself an able engineer, asked permission to take his party through Howse Pass, and thence to Edmonton, from which point he could survey westerly to Henry House, while party T, following the course of the North Thompson, could reach, *viâ* Cranberry and the Albreda Lakes, the westernmost portion of the line to be surveyed, namely, Tête Jaune Cache, and could operate thence easterly to Henry House. In reply, Mr. Fleming telegraphed that the time from Boat Encampment to Henry House would be only ten to twelve days, and that east of Jasper House the country was flat, wet and swampy, and he doubted the propriety of going by Edmonton. This led to Mr. Moberly's party proceeding *viâ* Athabaska Pass.

Mr. Moberly states that he then ordered the trail party which had been organized for the Howse Pass survey to proceed up the North Thompson, and to make a trail by which further supplies which he had contracted for might be transported to Tête Jaune Cache for the use of party T.

Party S did not reach Henry House until the 24th of October, 1872, having been compelled to make a trail all the way from the Columbia Depôt.

Mr. Moberly affirms that had he taken the route suggested by himself *viâ* Edmonton, he would have reached the scene of his intended operations three or four months earlier, and would have been able to complete the whole line of survey he was directed to make before the setting in of the winter.

Meantime party T, under Mr. Mohun, having reached Blue River, a point about two-thirds of the way from Kamloops to Tête Jaune Cache, and not having, as expected, fallen in with the supplies which had been somewhat delayed *en route*, became disorganized, and instead of going back to assist the trail party, its members spent some six weeks hunting for game.

In consequence of this delay and the tardiness of their operations they failed to reach Henry House as instructed; they arrived at Moose Lake on the 8th of September, having surveyed a line of twenty-nine miles from Tête Jaune Cache, at the rate of about a mile a day. They were, therefore, dismissed, and Mr. Moberly with party S, and the trail party under Mr. McCord, having worked eastward as far as Lac à Brulé some forty-nine miles distant from Henry House, went into winter quarters.

Mr. Moberly estimates the loss entailed by the delays attending the transport of his party and supplies from Howse Pass to Henry House to have been not been less than $60,000, and a sum nearly equal to that to have been thrown away by the misconduct of party T.

There is, therefore, strong reason to believe from the evidence that a large outlay of money, possibly over one hundred thousand dollars, was wasted in connection with the surveys of parties S and T during the years 1871 and 1872.

That Mr. Moberly and the Lieut.-Governor, Mr. Trutch, had good reasons for the objection to the route proposed by the Chief Engineer, is evident from the fact that some three months or more of the most valuable season of the year (notwithstanding that they had a pack trail of some 200 animals at their disposal), were occupied in making a trail and transporting supplies from Columbia River to Henry House, from which point their work easterly was to begin.

In the matter of furnishing supplies for his parties, a wide discretion was left with Mr. Moberly, and we have to report that this was not exercised with due consideration of the consequences. The evidence shows that in furnishing party S, he procured a large quantity of goods which, in the estimation of the Chief Engineer, as well as in ours, was unnecessary and ought not to have been purchased; and in providing for party T, it is only too apparent that supplies were procured and, at a heavy expense for transportation, taken to Eagle Pass, on the chance of their being afterwards required at that spot.

The withdrawal of this party from that district required that they should remove these supplies back to Kamloops at a cost of 80 cents per pound, or that they should abandon them. Inasmuch as flour could be purchased at Kamloops for 4½ cents per pound, Mr. Moberly decided on the latter course. He values the provisions so abandoned at about $7,000.

Mr. Moberly had, before his employment in the Canadian Pacific Railway, been engaged professionally in examining different portions of British Columbia. He discovered the Eagle Pass, which he thought to be a feasible one for a railway between Shuswap Lake and Big Eddy, on the route hereinbefore described, and having apparently a favourable opinion of that as a prospective location, he advised the instrumental survey of this link of of the line, and it was accordingly undertaken—as we think, unnecessarily because, as before mentioned, it could only be available in case the Yellowhead Pass was never adopted, and the problem whether it was to be adopted, could have been settled, and was in fact settled without any data derived from instrumental examinations.

There are two points concerning these supplies abandoned at Eagle Pass Pass, on which we think Mr. Moberly's action unreasonable, considering the circumstances in which he was placed at the time.

Assuming that a location of the line through this pass was to be expected to follow in 1872 the preliminary survey of 1871, and that therefore a provident foresight required that some provision for the supplies of the persons to be engaged in that work should be made during the first season, we think that if the final cost of them was to be taken into account, there was no good ground for supposing that the best course was to take them

with party T and to cache them as was done half way on the route to Big Eddy. It must be remembered that these supplies were understood to be wanted, if at all, only on the return trip of party T from Big Eddy to Shuswap Lake. It seems self-evident that if supplies could be laid down at this initial point at a cost far less than at Eagle Pass, then it should have been so arranged, the more especially as in transporting them westward, the party would be travelling over a road which they had traversed the year before—and would not be forced, as they were during the first season, to pack them over a route entirely new to them. Now, Mr. Moberly has testified, that the $7,000 worth of supplies cost 80 cents per pound to transport them to Eagle Pass, and that he did not take them farther east, because at Big Eddy they could be laid down by navigation from Colville at a cost for transportation of about 6 cents. We think the decision to take them from the west, as was done, to Eagle Pass, showed an entire disregard of pecuniary results.

But we have to point out that Mr. Moberly's action in providing them at all, was not based upon any instructions, on the contrary, it was solely on his opinion that Howse Pass would be eventually chosen in preference to the Yellowhead Pass; a result which was, to say the least, too uncertain to justify the outlay undertaken by him on the possibility of it. The evidence that this was the only ground for procuring those supplies to be deposited at Eagle Pass, is unequivocal.

Mr. Moberly testified that he left them there in 1871, expecting that in 1872 he would there complete the location survey, because he thought it probable that it would be the pass that would be adopted in preference to Yellowhead.

In our judgment this was not sufficient ground for Mr. Moberly's action concerning these supplies.

Without questioning Mr. Moberly's professional judgment, which we believe is entitled to respect, we cannot refrain from pointing out that he exhibited a tendency to insubordination, which, if general, would have rendered futile the best endeavours of the chief administrative officer of the Department, he had been elected to serve.

Mr. Fleming met Mr. Moberly, at or near Yellowhead Pass, in the summer of 1872, and after asking and receiving information as to these transactions which we have been describing, as well as others during the

preceding season, determined to dispense with his services, and subsequently by letter notified him to that effect.

Mr. Moberly, however, placed his own judgment above that of his superior officer, and decided to continue the surveys upon which he had entered until they were complete. In reference to this matter he says in his sworn deposition (p. 1828): "On receiving the letter above alluded to, the instructions conveyed in it were too childish to be followed, and I then decided that I would carry on any further work to the best of my judgment for the interests of the Government; that I should obey orders when I could see they were sensible, but not otherwise, and as soon as I could do so get out of the railway service as quietly as possible."

There seems also to have been a deplorable lack of discipline on the part of party T, conducted by Mr. Mohun.

It is manifest that a serious waste of money occurred in connection with the surveys in British Columbia during the seasons of 1871 and 1872.

The cost of the surveys over the whole line up to the 30th June, 1873 was $1,081,395.36, and may approximately be considered as covering the expenditure incurred in respect of the first two seasons' operations.

By the analysis of surveys accompanying this report it will be seen, that some forty-four parties were during that period engaged, being an annual average of twenty-two, of which three were merely explorations, the remainder instrumental surveys.

The Chief Engineer in his report of 1872 states, as has been before remarked, that nearly 800 men had been employed on the work The evidence which has been taken leads us to believe that the usual number of men attached to fully equipped surveying parties, ranged from thirty to forty-five; while that of those engaged upon explorations would reach eight or ten.

Assuming then that the nineteen instrumental parties engaged during each of the years 1871 and 1872, consisted of thirty-eight men (the mean between these two extremes), and that the three exploratory parties each consisted of ten, some 750 men would thus be accounted for. Dividing this number into the average annual expenditure of $540,697 we have $720 as the cost per man per season.

Applying the same method of calculation to the aggregate expenditure upon surveys to 30th June, 1880, the cost per man for each season averages about 700, or from $3 to $3.50 per day per man, during some six to seven months of the year. A detailed analysis of the expenditure made through Mr. Wallace, covering the outlay on account of parties operating east of Fort Garry, confirms this estimate. The whole sum expended through him amounts to $535,154.36. The number of men employed is found, by a careful examination of the pay-rolls, to have been equivalent to one man for 152,273 days. Dividing the former amount by the latter, we have almost exactly $3.51 as the cost per man per day. This sum covers wages, supplies, travelling and other expenses, including those of management. Excepting in some specific cases which have come before us in evidence, the expenditure for supplies, though high, does not appear to have been extravagant or wasteful. Still it must be remarked that the accounts have been very insufficiently vouched.

During 1873 the operations in the mountain regions were confined to exploratory surveys by Mr. E. W. Jarvis, Mr. C. H. Gamsby, and Mr. Walter Moberly, and an exploration by Mr. Marcus Smith. In the prairie district an exploration was made by Mr. Selwyn, and a survey by Mr. H. B. Smith, while in the woodland or eastern district some nine or ten parties were still engaged in trying to improve upon the lines which had been already run.

On the 26th January, 1874, Mr. Fleming made his second special report, and stated in effect that several routes through British Columbia had been found on which the obstructions met with, although formidable, were not insuperable. That a favourable and comparative easy route had been found from the Ottawa to the northerly side of Lake Superior; that it would be possible to locate the line direct from the northerly side of Lake Superior to the prairie region, without unusually expensive works of construction, and yet with remarkably light gradients in the direction of heavy traffic; that there would be no difficulty in finding a comparatively easy route across the prairie region, and, therefore, that the "practicability of establishing railway communication across the continent, wholly within the limits of the Dominion, is no longer a matter of doubt."

Mr. Marcus Smith, after nine years' connection with these surveys, and after having, as Acting Chief Engineer in Mr. Fleming's absence, made himself familiar with all the surveys from one end of the line to the other,

states in evidence that "the second year, in the middle of 1873, within less than two years we had sufficient information to begin to construct a railway across the country. It is possible, if a company had been making the surveys, they would have begun after one year's surveys."

It appears to have been considered that sufficient information had been gained at this date to warrant construction being proceeded with in accordance with the terms of Union with British Columbia, and a charter was granted for the building of the road throughout. This, however, lapsed before any works were commenced under it.

In 1874 the Canadian Pacific Railway Act was passed, and the construction of the railway, as a public work, was placed under the general superintendence of the Department of Public Works.

The second triennial period, of which that year marked the commencement, was one of great activity, sixteen explorations and sixty-four instrumental surveys (of which latter some twenty-eight were either revised or location surveys) took place during the three years referred to, apportioned as to districts as follows :—

Districts.	Explorations.	Instrumental Surveys.
Woodland Region	4	24
Prairie Region	4	11
Mountain Region	8	29
	16	64

The aggregate cost of these operations was a little in excess of two millions of dollars.

The thirty-six exploratory surveys averaged a little more than thirty-four thousand dollars each, as against twenty-seven thousand during the three years preceding.

Of the four explorations made in the Woodland region, one only was west of Nipigon, namely, that from Nipigon to Dog Lake in 1876; the remaining three were east of that point—one, in 1875, between Pic River and Sault Ste. Marie, and two, in 1876, between Pic River and French

River. The instrumental surveys undertaken in the Woodland region during the same period were as follows :—

West of Nipigon.	Exploratory Surveys.	Locations or Trial Locations.
1874	3	4
1875	6	
1876		4
	9	8

East of Nipigon.	Exploratory Surveys.	Locations or Trial Locations.
1874	5	
1875	1	
1876		1
	6	1

A detailed statement of these surveys, showing the country traversed, will be found at the end of our report upon the question of engineering, together with a table exhibiting the number and class of surveys in each district respectively.

Until we come to consider the question of location, there does not appear to be anything in connection with these surveys requiring special remark beyond the temporary diversion of the energies of the Engineering Department, during 1874 and 1875, in the direction of examining the interior water stretches.

Since the close of our sittings for taking oral testimony, Mr. Fleming has transmitted to us a copy of a memorandum addressed by himself to the Hon. Alex. Mackenzie, dated the 29th of September, 1874, bearing upon this matter, and has requested that it should be treated as part of his evidence, and inasmuch as it does not appear upon any of the public records we introduce it at this point.

Memorandum in reference to the construction of the Canadian Pacific Railway and Settlement of the North-West Territory.

OFFICE OF THE ENGINEER-IN-CHIEF, CANADIAN PACIFIC RAILWAY,
OTTAWA, 29th September, 1874.

To the Honourable ALEX. MACKENZIE,
Minister of Public Works, etc., etc., etc.

SIR,—In accordance with your wishes, I have given some consideration to the question of constructing the Pacific Railway, and the best mode of proceeding under the Statute passed last session. I now submit the general views I have formed on the subject.

You are already aware that I have always considered and advocated the construction of a line of telegraph, in advance of the railway, as a necessary and most important preliminary work.

The construction of the telegraph from the Pacific coast as far easterly as Lake Superior, is now placed under contract, and may be considered secured. For reasons which will hereafter be presented, I think that there should be no delay in inaugurating the construction of the telegraph from Lake Superior along the route of the Railway, to the south side of Lake Nipissing, at some point where it would connect with the telegraph system of Ontario and Quebec.

I have the highest possible opinion of the producing capabilities of much of the country extending for a thousand miles, west from the Lake of the Woods. I believe this vast territory is destined to support a very large population, and I think that a judicious expenditure on the part of the Government, in opening up lines of communication, together with a well devised scheme of emigration, will very soon have the effect of settling the country.

Under favourable circumstances, I believe that in a few years the population will be counted by millions, and that the day is not for distant when the census will show a greater number of Canadian subjects to west of the Lake of the Woods, than it now shows to the east of it. Ontario and Quebec will then be classed with the Eastern Provinces of the Dominion.

If such a population existed on the central plains at the present time, who, for one moment, would doubt the gigantic proportions of the traffic between the millions east and the millions west of Lake Superior—a traffic which would not only find a channel through the magnificent system of lakes and rivers during the season of navigation to the Lower St. Lawrence, but would absolutely demand for its service throughout the whole year, the shortest possible all-rail route that can be made.

The traffic indicated would, without any doubt whatever, fully occupy every line of communication now thought of. Freight would naturally seek the water channels during the season of navigation, while passengers and the light kinds of traffic would, as a general rule, go at all seasons of the year by rail. Looking to the future, therefore, it is of the utmost importance that the railway should be projected and constructed on the shortest possible route that can be found.

It is a mistake that many of the people have fallen into, to suppose that the shortest route would run south of Lake Superior. The best information yet obtained goes to show that a line south of Lake Superior would be from 59 to 94 miles longer than a line north of it, touching at Thunder Bay, and from 123 to 153 miles longer than a line touching at Nipigon Bay.

Entirely apart, therefore, from the question of passing through a foreign country, it is quite clear that all idea of spending Canadian money towards constructing a line south of Lake Superior should be abandoned, and every effort should be directed to establish a more direct line to the north.

Of the two lines north of Lake Superior, the one touching at Nipigon appears to be the shortest by about 64 miles. That route, therefore, is the one which, in my opinion, should be adopted, if one still shorter cannot be found. It would, looking to the not distant future and the vitally important objects to be gained by having the shortest possible through line, be most unwise to twist the main trunk railway a single mile out of the direct course. The very shortest line that can possibly be secured will be longer, all will admit, than we would desire. If, therefore, no line can be found shorter than the one referred to, by Nipigon, that undoubtedly is the true route for the line of railway.

To carry the trunk line round by Thunder Bay would practically be placing the Eastern and Western Provinces of the Dominion 64 miles further apart, and imposing an unnecessary tax of nearly two dollars per head on every passenger using the railway for all future time.

I must not be understood to advocate that the construction of a continuous *all rail* route north of Lake Superior should take precedence over everything else. I simply recommend that it should from the first be kept prominently in view and form part of the general design, and that when the proper time arrives it should be carried into execution. There are other sections and other works more immediately necessary.

Existing canals and railways in connection with the Great Lakes bring the steam communication of this country from the Atlantic Ocean to Thunder Bay. Thunder Bay is the natural and proper outlet for the mixed land and water route, thence to Manitoba, popularly known as the Dawson route. This line of communication should, I think, at once be rendered as efficient as possible for present purposes, and for permanent use during the seasons of navigation as a freight route.

The Dawson route will never be of much service, until it is operated by steam throughout; the 50 miles east of Lake Shebandowan and the 100 miles west of Lake of the Woods, should immediately be railwayed, the portages intervening that cannot be canalled should at once be tramwayed and provided with the best mechanical contrivances for transferring and handling freight, with ease and speed.

The outlet of the Lake of the Woods at Rat Portage is an objective point on the Pacific Railway and may be made a common point on the Dawson route; from thence to Red River the railway should be made common to both lines of communication.

East of Rat Portage, I think that it would be advisable to establish the Dawson route as an entirely independent line of traffic.

I am perfectly well satisfied that at no distant day, the traffic between Lake Superior and Red River will fully engage both lines of communication, and that the part of the Pacific Railway which will first demand a double track, will be that portion between Rat Portage and Red River.

I feel convinced that the Dawson route, improved and employed to the fullest capacity, will be utterly inadequate for the freight traffic that will be created, and hence the importance I attach to the construction of that portion of the Pacific Railway between Red River and Lake Superior, of such a character as will specially adapt it for the heavy traffic which will soon seek this channel.—*Vide* Pacific Railway report 1873, page 33.

The Pembina Branch will of course be useful for a short time, in giving access to Manitoba, until the other and more direct lines are established through Canadian territory.

The Canadian Pacific Railway from Manitoba eastward cannot stop short at Lake Superior; there terminating, it would only be employed during the summer months. The Pembina Branch would continue to be the only inlet and outlet during the winter season, but when the country becomes populous the people on the plains will never be satisfied to make a journey through the United States of 1,589 miles to Toronto, when it might be reached by travelling only 1,173 miles; nor would they submit to be thrown 1,925 miles away from Montreal when the completion of the link east of Lake Superior would shorten the distance 637 miles.

With regard to the country west of Red River, the question of the day is really its settlement. The lakes and rivers can undoubtedly be used in promoting this work, to a great extent, but owing to the climatic fact that the water channels cannot be employed at all for a considerable portion of the year, something more than the navigation of the lakes and rivers is required to render the settlement of the country speedy and successful.

We must look to the establishment of railways, not simply a trunk line, but a complete railway system, as the only satisfactory means of maintaining communication between the several sections of this vast territory.

A trunk line is probably the first railway that should be undertaken. Branches to it will follow in due time, and they will ramify in every direction where profitable traffic is found possible.

Everything so far points to the Yellowhead Pass as the proper gateway through the Rocky Mountains to the Pacific coast. Whatever explorations now being made and yet to be made may bring to light, I assume for the present that the trunk line will pass through the Yellowhead Pass, and I have laid down on the accompanying map its probable approximate position from Red River westerly.

From the trunk line I have indicated where some leading branches may be judiciously established. It will be seen that one branch is projected from the main line at the Red River Crossing, nearly due west by the valley of the Assineboine. This branch would serve the fertile country in that direction, and extended to the coal deposits recently discovered by the Boundary Survey, would supply the inhabitants of the Province of Manitoba with fuel. Other branches are shown from the main line, southerly and northerly. From a point in the neighborhood of Edmonton, one of these would run through a beautiful and extensive country on the eastern flank of the Rocky Mountains, extending from the North Saskatchewan towards the boundary of the United States, while another would tap the Peace River region, and both would be of immense service in the developing of the mineral and agricultural resources of these regions.

Many other branches will be formed as circumstances require; those I have alluded to are simply leading ones that suggest themselves at the present time.

With regard to the country on the western side of the Rocky Mountains, and the railway route through it to the Pacific coast, it will be necessary to wait until the surveys are further advanced before much more can be said than has already been presented in my last general report. All that can now be done is to reserve a sum for proposed expenditure on whichever route may be found most eligible.

Having submitted these general remarks, I will now proceed to state the views I have formed with regard to the carrying into execution the important works referred to.

It would undoubtedly be advantageous, in many ways, to construct the Pacific Railway through the instrumentality of a large company, instead of directly by the Public Works Department.

I feel satisfied, however, after giving the matter careful consideration, that it would be best, during the next two years or so, to carry on initiatory and desirable works directly by the Department of Public Works. This would give time to obtain full information respecting every portion of the country, to locate the railway route, to erect the telegraph, and to do all the works embraced in the telegraph contracts, such as clearing, making roads, &c. It would enable the Government, as well as parties who may propose entering into contracts, to form a more intelligent idea of the undertaking proposed to be carried out, than can possibly be formed at the present time.

Before the expiration of a period of say two years, the Government could publicly invite and receive proposals from capitalists, who might be prepared to form one or more strong financial companies, to carry out the undertaking, and such proposals as may be made, could embrace the assumption, by the contracting company or companies, of such portions of the whole scheme as the Government may execute in the meantime, and as may be stipulated.

In the meantime, I would recommend that the Government, through the Department of Public Works, proceed during the next two years, with as much energy as possible, in carrying out certain preliminary and necessary works as follows:—

Firstly.—Telegraph Line, including clearing, two chains wide along the route of the Railway, throught forest and pack-trail or roads.

1. British Columbia to Edmonton	$300,000
2. Edmonton to Fort Pelly	117,250
3. Fort Pelly to Fort Garry	56,250
4. Fort Garry to Lake Superior	189,120
5. Lake Superior to Lake Nipissing	250,000
	$912,620
Total, say	$1,000,000

Secondly.—Land and water communication from Lake Superior to Red River (Dawson route)

	Approximate Expenditure.
1. Railway from River Kaministiquia to Lake Shebandowan	$1,000,000
2. Railway from Rat Portage to Red River	2,000,000
3. Portages and equipment between Lake Shebandowan and Rat Portage	250,000
Total expenditure on the Dawson route, of which $2,000,000 would be common to the trunk line of the Pacific Railway	3,250,000

Thirdly.—Land and water communication, Red River to the North Saskatchewan.

1. Railway from Red River to Lake Manitoba	$1,500,000
2. Portage, railways, improvement of navigation of Saskatchewan, steamboats, etc	250,000
Total expenditure in connection with the Saskatchewan navigation, of which $1,500,000 would be on account of the main line of the Pacific Railway	$1,750,000
Fourthly.—Pembina Branch	$1,000,000
Fifthly.—On account of construction of Pacific Railway in British Columbia and between Rat Portage and Nipigon	$3,000,000

RECAPITULATION.

1. Pacific Railway Telegraph Line	$1,000,000
2. Railway and water communication from Thunder Bay to Red River	3,250,000
3. Railway and water communication from Red River to Edmonton	1,750,000
4. Pembina Branch Railway	1,000,000
5. Pacific Railway in British Columbia, etc	3,000,000
Total	$10,000,000

The expenditure above suggested would initiate construction generally throughout the whole line, and it would probably be quite as much as could judiciously be made within the period referred to.

It would secure a telegraph line along the route of the railway from Ottawa to British Columbia, it would clear the forest land to a width of two chains, it would establish a road passable for horses along the entire route, and thus give access to the country for contractors, explorers and settlers, who would follow and render the establishment of regular postal communication possible and easy at a very early day.

The expenditure proposed would also develop and so far perfect the Dawson route, as a line of steam communication, as would make it really serviceable for all kinds of traffic until the completion of the railway between Lake Superior and Red River. On the completion of the railway a classification of the traffic would naturally follow. The Dawson Route would continue to be of value as a means of transporting way freight, while passenger and other traffic would find their way by rail.

The expenditure proposed would also connect Red River by rail, with Lake Manitoba, place railways on the portages lying between Lakes Manitoba, Winnipegosis and the Saskatchewan River, improve the rapids of the Saskatchewan, place steamboats on the whole route

and thus practically extend the means of steam communication from tide water at Quebec, by both branches of the Saskatchewan, to the foothills of the Rocky Mountains.

It will be seen, too, that the expenditure contemplated will be strictly confined to those portions of the great lines of communication essential to the opening up of the country, and which would in the highest degree assist in the economical construction of that which, at the end of two years, would remain to be done.

In the estimate presented, I have placed $3,000,000 for expenditure in British Columbia and on the line between Rat Portage and Nipigon. I have not attempted to separate the sum, as the amount which may be expended in British Columbia depends so much on circumstances.

With regard to the estimate, I may state that, although roughly approximate, it may be considered a liberal one; and with regard to the period of two years, I should not be understood to mean strictly two working seasons.

I should rather have used the general expression two or three years, as, owing to the peculiar circumstances which obtain, I doubt if it would be possible to carry out all that is contemplated or expend the estimated amounts judiciously and economically within the shorter period. There would be nothing, however, to prevent the Government entertaining any proposals that may be made by financial companies, for the construction of the whole line of railway before the completion of those portions herein referred to; the amount actually expended could then be considered as so much paid the company on account, or dealt with as may then be agreed.

My present object (on your invitation) is to point out which plan of procedure would, in my judgment, be the best. I feel well convinced that whether or not it may be considered advisable to place the whole undertaking by and-bye in the hands of one large company, it would in the meantime be in the public interests to initiate construction in some such manner as herein indicated. I am satisfied that with the preliminary works alluded to, well advanced, every section of the country made accessible and its speedy settlement assured, it would be possible to make terms with capitalists far more favourable to Canada than can possibly be expected at the present time.

Should you entertain favourably the suggestions herein contained, I would further recommend that public notice be at once given that the grading of the railways from Thunder Bay to Shebandowan, from Red River to Rat Portage, and from Red River to Lake Manitoba, will be ready for contract before next meeting of Parliament, and that tenders will be invited so soon as the surveys now in course of completion be ready, and the plans, profiles and specifications prepared; the object being to afford intending contractors an opportunity, before winter comes on, of personally examining into the character of the excavations which will require to be made on the several sections referred to.

I am, &c., &c,

SANDFORD FLEMING.

A contract was entered into with the Hon. A. B. Foster in 1874 to survey and build a line of railway, known as the Georgian Bay Branch, ter-

minating at the mouth of French River on the Georgian Bay. Some three or four hundred miles of lake navigation became available from that point to Thunder Bay Thence the line of the Canadian Pacific Railway was located to Lake Shebandowan, and surveys were entered upon to ascertain to what extent the lakes and rivers of the Dawson route, might be utilized and the portages overcome. Further surveys were undertaken with a view to ascertain if the navigation of the Lake of the Woods could be extended westerly, and examinations were made of certain portages in connection with lakes Cedar, Winnipegosis and Manitoba, in order to ascertain the practicability of uniting their waters by short canals.

In pursuance of this general object the construction of Fort Frances Lock was entered upon early in 1875.

The Hon. Mr. Mackenzie, while giving evidence before us, stated "that the policy of the Government looked to the possibility of the road east of Thunder Bay not being constructed for many years, and to use the water as a means of communication between the Ontario system of railways and Fort William, and possibly to utilize the small lakes in the interior of the country also for a term."

Inasmuch as these surveys were entered upon in pursuance of a certain policy of the then existing Administration, we consider it unnecessary to do more than refer to the matter in the most cursory way.

The Canadian Pacific Railway Act of 1874, to which allusion has already been made, provided among other things that a line of electric telegraph should be constructed in advance of the said railway and branches along their whole extent respectively, as soon as practicable after the location of the line had been determined on. In the autumn of the same year, contracts for the construction of a continuous telegraph line from Thunder Bay on Lake Superior to the then existing telegraph system of British Columbia, were entered into. The location of the whole line at an early date therefore became necessary.

The first definite location of any portion of the line, was that of the Pembina branch, over a section of the country, which left little room for engineering ability. Owing to the distressed circumstances of many of the inhabitants of Manitoba, the Government decided, in the summer of 1874, to place under construction the portion of the line between Winnipeg

and the international boundary, and instructions were issued to Mr. Rowan, the district engineer in that Province, to locate the line without delay, following as much as possible some of the road allowances between the two points named. This was done, and on the 8th of August tenders were invited, which resulted in a contract, dated on the 30th of that month, for the construction of the road bed.

In April, 1875, the line from Fort William to the Shebandowan and from Selkirk to Cross Lake were placed under contract, and on the 7th June, 1876, the construction of the line from Thunder Bay to Shebandowan, having been diverted in a more northerly direction from Sunshine Creek westward, the grading and bridging from that point to English River was contracted for. The manner of letting these contracts and all other matters relating thereto, not directly of an engineering nature, are dealt with later on.

In nearly every case, from 1875 to 1878, the contractors came upon the ground prepared to commence operations before their work was fully laid out. In the case of contracts 13 and 14, it is alleged that losses were sustained by the contractors on this account, and claims were in fact preferred against the Government for compensation, one of which was paid, and the others are pending. This brings us to the consideration of a matter which has given rise to much controversy —that is the insufficiency and inaccuracy of information offered to tenderers in connection with the construction of the road-bed.

During the progress of the evidence it has transpired that in the case of the first four contracts for road-bed construction between Thunder Bay and Red River, tenders were invited and contracts let before a sufficient examination had been made of the projected line to enable the Engineering Department to state, in most cases, even approximately, what work would require to be performed.

The bills of works offered to tenderers were invariably calculated from nothing more reliable than profile plans. In every case the contract was let before the quantities had been made up from cross sections. Mr. Fleming testified that an estimate so made would be a "mere guess." It might, therefore, have been expected, and it did happen that the quantities stated in the bills of works have, in nearly every case, been largely exceeded by the actual quantities the contractors were called upon to

Perform. As respects the contracts named the difference between their actual cost and the amount at which they were contracted for was over fifty per cent., as follows :—

	Anticipated cost at date of letting contract.	Actual cost as far as ascertained.
	$	$
Contract 5	200,000	208,163
do 5a	60,000	161,124
do 13	*294,000	313,200
do 14	402,950	730,136
do 15	1,593,085	2,582,479
do 25	1,037,061	1,396,824
	3,587,096	5,391,926

* The estimate in this case was really $406,194 for about forty-five miles—the westerly twelve and a-half miles were abandoned, and for illustration only this amount $294,000 is taken, being about the same proportion as the distance finished.

The Chief Engineer has expressed the opinion that although accuracy in the estimated quantities offered to tenderers is, of course, desirable, it is not of any great importance when contracts are let upon a schedule of prices. In such cases he affirms the aggregate cost of the work may be greater than expected, and thus lead to disappointment; but that no material loss can accrue to the Government. He was asked whether inaccuracies in the estimated quantities, particularly when the offers were inconsistent in prices, did not sometimes affect the actual and final cost of the work in addition to leading to disappointment. His evidence was that he was not aware of a single instance where that had been the result, and that in no case had the rank of the tenderers been altered to any appreciable extent by such inaccuracy. The evidence leads us to a different conclusion. If the quantities upon which the tender is based should turn out to be approximately correct, and the various tenders consistent as to prices, the relative position of the tenders, when subsequently based on executed quantities, might not undergo much change, but should the prices affixed to the tenders be incongruous and the relative proportions of earth excavation, rock, masonry, &c., be materially altered during the process of construction, then those tenders which seemed to be the lowest might turn out to be considerably higher than others. To exemplify this a statement

has been prepared showing, firstly, the relative positions held by the tenderers for section 15, and under which the contract was made, and, secondly, the relative rank they would have occupied had the figures contained in the last progress estimates been offered to tenderers, instead of the imaginary quantities upon which their offers, as a matter of fact, were based.

STATEMENT showing the result of letting contracts upon the plan of a schedule of prices, where the quantities offered in the bills of works are inaccurate, and prices affixed by tenderers relatively incongruous.

Names of Tenderers for "Section 15."	At date of opening tender as per original Bill of Works.		As they would have ranked had Bill of Works corresponded with last Progress Estimates.	
	Rank.	Amount.	Rank.	Amount.
		$		$
Martin & Charlton	1	**1,540,090**	6	2,586,959
Sutton & Thompson	2	**1,591,825**	5	**2,582,479**
J. A. Green	3	**1,679,063**	3	**2,467,338**
Talbot & Jones	4	**1,683,085**	9	2,643,213
D. Hinkson	5	**1,695,665**	1	**2,386,342**
Hill, Lipe & Co	6	1,727,875	10	2,706,780
D. S. Booth	7	1,734,820	7	2,597,883
C. C. Gregory	8	1,745,935	19	3,392,905
Mullen & Whelan	9	1,749,393	12	2,731,047
O'Brien & Ryder	10	1,780,310	11	2,729,295
J. Whitehead	11	1,799,790	8	2,635,797
A. Farewell	12	1,815,485	2	**2,433,022**
Wright & Scachrel	13	1,832,175	4	**2,514,249**
Kavanagh & Co	14	1,895,404	14	2,751,909
M. A. Cleveland	15	1,899,680	13	2,731,814
Hunter & Murray	16	1,966,735	15	2,779,112
Campbell & Kelly	17	2,052,770	17	3,098,611
McFarlane & McRae	18	2,093,970	16	2,939,144
Brown & Ryan	19	2,199,125	18	3,266,771
Reed & Dixon	20	2,950,000	20	3,523,734

In preparing this statement the tender of Macdonald & Kane has been omitted for the following reason:—

Mr. Macdonald stated in evidence that he declined to enter into the contract when awarded, because he had based his calculations upon section 14 being completed within a certain fixed time, by which condition the Department would not agree to be bound. His calculations were therefore based upon contingent conditions, which those of other tenderers were not, resulting in lower prices throughout, which prices he refused to stand by unless the uncertainty which surrounded his competitors were in his case converted into a certainty by the Government guarantee. For this reason his tender is not fairly comparable with the others, and has been excluded.

It will be seen by reference to the above statement that the five tenders which were assumed to be the lowest were as follows:—

1. Martin & Charlton	$1,540,090
2. Sutton & Thompson	1,591,825
3. J. A. Green	1,679,065
4. Talbot & Jones	1,683,085
5. D. Hinkson	1,695,665

Had the quantities contained in the bill of works furnished to intending tenderers been according to the work actually required to be done, the tenders would have rated as follows:—

1. D. Hinkson	$2,386,342
2. A. Farewell	2,433,022
3. J. A. Green	2,467,338
4. Wright & Scachrel	2,514,249
5. Sutton & Thompson	2,582,479

Thus, by a change in quantities (the prices being the same in both cases) the lowest tender, that of Martin & Charlton, finds no place among the first five.

The second lowest, that of Sutton & Thompson, on which the contract was actually based, recedes from the second place to the fifth.

The last of the five, that of D. Hinkson, becomes the first, and two tenderers ranking twelfth and thirteenth under the original bill of works, become respectively second and fourth.

It will be further remarked that, while by virtue of the first calculation, Sutton & Thompson, the second lowest and successful tenderers were

below D. Hinkson by $103,840, by virtue of the second and upon the actual work done, their tender is higher than his by no less than $196,137.

Their relative position, therefore, has been altered by the change of quantities by some $300,000.

Had it been possible, therefore, to offer accurate quantities to tenderers, Mr. Hinkson should have obtained the contract at a price which would have saved the Government nearly $200,000, or about 8 per cent. upon the entire outlay.

The foregoing facts sufficiently illustrate the principle involved.

Recognizing this feature as one calling for careful consideration on the part of the Government, enquiries have been directed during the examination of both contractors and of engineers, to the existing system of offering public works for tenders; but neither contractors nor engineers appear to think that there is any alternative method between that of basing tenders upon a bulk sum and that of basing them upon a schedule of prices, as at present carried out. While each system has its advocates amongst engineers, both appear to us unsatisfactory and unreliable. It has occurred to us that a modification of the existing practice might be worthy of consideration. The danger attaching to the present system would seem to arise mainly where the prices upon which a tender is based are relatively incongruous. It will be easily understood that if a contract is based upon an unreasonably high price for one class of work, rock for instance, and a correspondingly low price for another class, earth for instance, then a change in the course of construction, which would increase the quantities in rock, would augment the profits; but if the increase should be in earth it would diminish them; while, if both should happen, that is the rock, be diminished, and the earth increased, then the contract which had promised large profits might involve an actual loss; and so, from time to time, the chance of loss or gain on the bargain would fluctuate with such changes as might be made on the different classes of work. A contract for the same works, based on a different tender where the offer for rock was unreasonably low, and the earth proportionately high, would, by such change, be affected in the opposite direction; the increase of rock causing a loss—of earth, a gain.

It is plain, therefore, that tenders showing the same total for the whole estimated quantities would not be equally advantageous to the Government under all circumstances; and, in fact, if the prices were not consistant throughout, the relative rank of tenders would change according as the

particular classes of work might be increased or lessened, on which their respective prices were too high or too low.

No such change in results, however, could happen if the prices given in the tender afforded on each class of work about the same percentage of profit or loss as the case might be: the increase or the decrease of the quantity would proportionately increase his profit or loss and no more.

In such cases the result of a contract to the contractor and to the Government, would depend on a careful consideration at the beginning of the real value of each kind of work. That being ascertained, the tenderer whose capital and ability gave him facilities over others, could well make the lowest offer.

If, after having obtained by a thorough survey, fairly accurate quantities, the Department—having due regard to the conditions as to locality, facility of approach for moving machinery and supplies, and other considerations affecting cost—were to fix a standard price for each class of work offered under the schedule, and invite tenderers to state at what uniform percentage above or below that standard they would be willing to undertake the work, then these difficulties arising from incongruous tenders would disappear, and with them the great temptation offered to the Government Engineer to permit, or even suggest modifications, by which low priced work would be diminished and more remunerative work increased.

Lest from the foregoing remark it might be inferred that, in our opinion, the public interests had suffered from the recreancy of the supervising engineers to their trust in the manner indicated, it is only fair to say that the whole tenor of the evidence has been generally in a noticeably contrary direction.

Apart from the error of judgment in supposing that contracts may be let with impunity upon bills of works in which no more than fictitious quantities are named, the engineering of this period is marked by an unfortunate omission for which we find no excuse.

The Government was committed to the final location of considerable portions, in all 225 miles, of the line between Lake Superior and Red River, without any adequate effort having been made to learn the nature or the extent of the different kinds of material which would be met with in the actual construction of the work. These sections were from time to time submitted to public competition and placed under contract, in ignorance of

data upon which a reasonable amount of information is indispensable where the element of cost is of any consequence.

The absence of this information led to the executed quantities being largely in excess of those which were presented to the tenderers by the bills of works on which the prices were to be fixed and the total cost of construction estimated.

In addition to the disappointment occasioned in these instances by the increase in cost over that which was assumed at the time to be approximately correct, we are of opinion that the money expended on the works, reached a higher figure than would have been necessary had the Government and the tenderers been informed, as fully as the circumstances permitted, concerning facts which could have been readily ascertained, and which it was the duty of the Engineering Department to ascertain, before advising upon the quantities or the value of different classes of the work.

Between Thunder Bay and Red River, the country at each end of the located line is comparatively flat, while towards the middle of it the surface is very irregular, owing to the frequent and sudden changes from stretches or knolls of rocky formation to the waters of lakes or inlets. The distance covered by section 14, next east of Red River, was principally flat. The easterly two miles of it and the adjoining section 15 was of the roughest character. Next Lake Superior section 13 was rather level; the section 25, next west of that, was as a rule "flat, but dotted with rocky islands like small hills."

It is the cost of these four sections, in all about 225 miles, which we consider to have been materially affected by the ignorance to which we have alluded. Over the very rough portion of the country, notably on section 15 and the adjoining portion of 14, the embankments made through the waters have called for a very large quantity of material beyond that supposed to be sufficient when it was first decided to cross them by a solid road-bed. The truth is that the depth of waters, and that was about all that was known to the engineers, gave but a faint idea of the quantities which had to be deposited, before a suitable embankment could be raised upon a sufficient foundation.

The bottom of these waters was composed of soft, deep and movable mud. The weight of the embankment, as it was built up, caused a sinking much beyond that which would have occurred had the bottom been of the character which it was assumed to be, and in its progress downwards to a

firmer foundation, the earth dumped into the road-bed displaced the original bottom so that it was pressed outwards and upwards above the former water level, for hundreds of feet on each side of the work, yielding its place below to material provided by the contractor at Government expense.

How far the expense of providing material for this purpose could have been prevented is not known. It was never ascertained, because no other location was looked for in order to avoid this expense. Whether the soft movable mud which has been described is to be found in some localities of a greater depth than in others, or whether it invariably bears a relation to the depth of water over it, or to the area over which it is found, are data which would be necessary to have, before deciding to what extent, if any, a different location would have saved the cost occasioned by it on the line adopted.

The absence of knowledge concerning the natural formation under the line of country selected for the location, led to another serious disappointment in this—that long swamps were crossed, which subsided under the weight of the road-bed to such an extent, as to render it necessary to make the embankments deeper than would have been necessary, had the natural foundation been of the character which the Engineering Department assumed it to be. This is particularly the case on section 14 where the Julius Muskeg is crossed.

Speaking of this locality, Mr. Murdoch testified that he was, from different examinations in that part of the country, aware, in 1872, of the character of the marshes and the bottoms of them; that he had passed over the vicinity of the line, and had noticed where "poles were stuck down to any length." He said that about that time in a conversation with Mr. Fleming and Mr. Rowan, he alluded to "the swamps that surrounded the outskirt of the whole of that rocky country," mentioning that they "were very deep and very long in some instances," and communicating what he considered to be the difficulties of those places. Upon this occasion Mr. Rowan differed from him, and, according to Mr. Murdoch's recollection, stated that there "was good sandy bottom."

In another locality, that of section 15, the work of construction was designed and the quantities stated in the bill of works given to the tenderers as if the excavations on the line, or close by, would provide but a small proportion of the earth required to make a solid embankment, and

instead of that it was arranged that trestle work should, in the first place, be erected to carry the track.

Mr. Ruttan, who was the contractor's engineer on this section, testified that upon their first inspection of the line, they saw that the embankments could be made from the immediate locality without resorting to trestle work.

During the progress of the work on this section, the character of it was changed completely, by abandoning the trestle work as a prominent feature and adopting solid earth instead.

We do not think it material to the matter now under consideration that other engineers differed on these subjects from those who had the direction of affairs. What occurs to us is that whatever the opinions of other engineers might be, or whether such opinions were known or not, it was the duty of the Engineering Department, before advising the Government to select particular locations, to ascertain, by methods well known to the engineering profession, such facts as would enable the Department of works to estimate as closely as circumstances would permit, the cost of any particular section, either with or without comparison with any other.

We can only say, concerning these matters, that having no knowledge of them, the Department of Public Works was not able to learn whether, other things being equal, the line selected was in the locality where it could be constructed at the least expense to the country.

In another matter, however, we have come to the conclusion that the ignorance of what could have been readily learned and ought to have been learned, has led to a large direct loss.

Over a considerable distance of the country between Thunder Bay and Selkirk, swamps or muskegs prevail. The material here is of a spongy nature, holding a considerable portion of water, so that when it is removed from its natural position and placed in an embankment, from 40 to 60 per cent. of its original size disappears, and the balance only is of any practical use. Throughout the four contracts above mentioned, the removal of this material has been paid for as if it had been ordinary earth, and in the case of two of them, 14 and 25, the work in this particular material was extensive, so much so that Mr. Fleming attributed the increase of cost on section 25 over that originally contemplated, as entirely due to the large quantity of this material, and paying for it at earth prices. We find this excess to be over $350,000

Enough has been said to make it manifest, that the country has had but poor compensation for the money spent on excavation through muskegs. This, however, would not show that the loss is due to an oversight in the engineering.

An engineer who had been in the Government employ during the construction of these links, and speaking of muskeg, testified that he had seen "men taking it out with a broad axe in large pieces over a cubic foot in size, and pitching it on to the barrow with a prong fork instead of a shovel," and that he had "seen a man wheeling a barrow full of this stuff out of the ditch, placing it in a dump, and when he was running up the board (the plank on which he was wheeling) the top of the load was higher than his head ; that it had no consistency."

Although this description may be of an instance where the material was lighter and less valuable than usual, the whole evidence concerning it shows that it was not worth nearly so much to excavate as ordinary earth, and was not worth half as much for practical results. There is no escaping the conviction, that had its nature been known, when the construction of these sections was submitted to competition, muskeg material would have appeared in the bills of works, as a separate item.

Mr. Fleming was examined concerning this matter ; and it is apparent that there never was, even in the last of these contracts, any provision made for inviting distinct offers concerning it. Late in the day, he directed the attention of the engineers to the expediency of avoiding its use where that could be done, or of rendering it more available by cross-logging ; but the fact remains that when it was used, and in many places it had to be used, it was paid for at the price of ordinary earth.

We can have no doubt that if its nature had been noticed and remarked upon in the information given to tenderers, the offers would have contained a lower price per yard for moving muskeg material than for ordinary earth, and that a large saving in the cost of the railway would have been so effected. Although we have said that the muskeg material was of less practical use than ordinary earth, we do not mean that it does not make so good a road-bed, for, on the contrary, there is a certain elasticity in it which makes it a pleasant road to ride on, and it is easier on the rolling stock and permanent way ; in order, however, to preserve it from fire, it requires protection by a coating of gravel. The objection concerning it is that, under the circumstances, the price paid for it was unreasonably and unneces-

sarily high. The quality of this material is of a desirable character; but the quantity remaining in the embankment was small, compared with that excavated.

Mr. Fleming, during his examination, raised an argument that a clause in the specifications made it unnecessary to pay for this muskeg at earth prices. No other witness, engineer or layman, gave such an opinion; and the language leads us to say that there was no room for his argument.

The clause upon which he relied principally was this:—

"30. The measurement of quantities shall invariably be made in excavation, unless in special cases, if any, where this may be found impossible; in such cases the engineer shall determine the quantities in embankment, after making all proper allowances, of which he shall be the judge."

According to our view, this does not touch the case under consideration; it cannot be said that it was impossible to measure the quantity which was excavated; and that under this clause the embankment must be resorted to for the purpose of learning how much had been taken out.

That clause clearly refers, as was mentioned in evidence by another engineer, to such cases as sometimes occur where, from the shape of the original surface, or some other cause, it is not possible to ascertain the cubic contents of the material which was taken away, and then the next best thing is to see what is in the embankment made from it, and after making due allowances so to estimate the work done.

Clause 17 of the specification seems to make it plain, that by the contract this material was to be treated, for the purposes of payment, as ordinary earth.

The following is the language of clause 17:—

"17. Excavation will be classed under three heads, *viz.*: *Solid Rock*, *Loose Rock*, and *Earth*, and will be paid for according to the following definitions:

"1st. All stones and boulders measuring more than 40 cubic feet, and all solid quarry rock, shall be termed *Solid Rock Excavation*.

"2nd. All stones and boulders measuring more than 14 cubic feet, and less than 40 cubic feet, and all loose rock, whether in situ or otherwise, that may be removed with facility by hand, pick or bar, without the necessity of blasting, shall be termed *Loose Rock Excavation*.

"3rd. All other excavation of whatever kind, with the exception of off-take ditches referred to in clause 13, shall be termed *Earth Excavation*."

At all events the discussion about the meaning of the specifications might well have been avoided, and it is at best an endeavour to save by some argument, on the legal effect of a document, an outlay which could

and ought to have been saved without discussion, by learning, before locating and contracting for the construction of the road-bed, the nature of the material which was likely to be met with in the prosecution of the work. The serious omission to which we have here called attention would not have occurred had the Chief Engineer and his subordinates acted on the elementary principles of railway engineering.

Professor Rankine in his work on Civil Engineering describes the steps to be followed in Railway Engineering, placing first the reconnoissance or exploring of the country. Of this his language is :—

"The *reconnoissance* or *exploring* of the country by the engineers with a view to ascertaining in a general way the facilities which it affords for the proposed work, and determining approximately the best site or course for that work. In this process the engineer will pay attention to the geological structure of the ground, and the sources from which useful materials may be obtained."

And he proceeds to give the order of the subsequent steps in such operations; amongst them that of *designs and estimates.* Before this step, however, he names as an earlier one that of *Trial pits and Borings*, of which he speaks as follows :—

"*Trial pits and Borings* will be proceeded with, while the levelling for the detailed section is in progress in order to ascertain the strata of the ground. Borings are the less costly, in time, labour and damage to ground, but pits are the more satisfactory to the engineer and the contractor. The results of the trial pits and borings may be marked with plan and sections for the use of the engineer."

Before the works on these sections were offered to public competition, a large expense had been incurred in the operations of surveying parties to and fro over this country. It has been suggested that surveying parties sometimes failed to discover the nature of the soil, because in winter it is covered by ice and snow.

It is not urged, however, that it is impossible then to learn what is requisite, but merely that it cannot be done without taking more trouble than at other seasons. This is hardly a reason for omitting one of the first duties of engineers in preparing for the construction of a railway over a new and unbroken country.

Even this insufficient reason, however, is not according to the fact, for surveys had been made over the country between Lake Superior and Red River in various directions, in different years, in summer and in winter; and on no occasion, until after large amounts were called for beyond the expectations based upon the engineers' first estimates, was recourse had to

the boring implements well known to the engineering profession as a means of acquiring information, such as that to which we have alluded.

We feel constrained to say that the Engineering Department in this case failed in its duty to inform the Government upon facts which are well understood to be material to a correct judgment on the probable cost of a railway, and that there was no sufficient reason for such omission.

In the year 1875, Selkirk was fixed upon as the point at which the Canadian Pacific Railway should cross the Red River. It has been stated by the Honourable Mr. Mackenzie, that the decision as to this matter was left entirely in the hands of the Chief Engineer. The reasons given for the selection of Selkirk are as follows :—

1st,—It was available to navigation plying upon Lake Winnipeg.

2nd,—The banks were lower at that point than at other points nearer Winnipeg, so that a track might be more readily run down to the waters edge for the purpose of transhipment.

3rd,—That in its vicinity there was a considerable bay suitable for the harbouring of vessels through the winter ; but the reasons which seemed to have had the greatest weight were :—

4th,—That, at the point of crossing, the Government held some 600 acres of land and,

5th,—That the Chief Engineer considered that point less liable to inundations than any point nearer Winnipeg.

The choice appears to have been an unfortunate one. Even as early as 1875, the Pembina branch being then in course of construction, it must have been evident that Winnipeg would attain considerable importance as a distributing centre. Section 14, moreover, having been placed under contract and considerably advanced before the adjoining section was finally located, a line from Rat Portage, *viâ* Falcon Lake to Winnipeg, which we conceive to be more eligible than the one adopted, was thereby sacrificed at a present loss, estimated by competent engineers, at not less than $500,000, and a permanent disadvantage of some twenty miles additional length.

The following operations took place in the prairie region during the second triennial period, viz :—

——	Explorations.	Exploratory Surveys.	Location Surveys.
1874	1	3	1
1875	2	2	1
1876	1	2	2
	4	7	4

Excepting as to the location *viâ* the Narrows of Lake Manitoba, which is dealt with in another place, there is nothing in respect of these surveys which seems to us to call for special comment. We, therefore, pass on to consideration of the Mountain district.

During the years 1874-5-6, eight explorations and twenty-nine instrumental surveys were made in British Columbia.

Only eight of the instrumental surveys appear to have been directed towards improving the projected route to Burrard Inlet, while the eight explorations and twenty-one instrumental surveys were made with a view to reach more northerly harbours.

We proceed to give a synopsis of these surveys for each year under the two destinctive heads above referred to, namely, those pointing to Burrard Inlet, and those having in view as a terminus Bute Inlet or more northerly harbours, viz. :—

Burrard Inlet.	Explorations.	Exploratory Surveys.	Revised or Location Surveys.
1874	—	4	2
1875	—	—	1
1876	—	—	1
Total	—	4	4

More Northerly Points.	Explorations.	Exploratory Surveys.	Location Surveys.
1874	5	1	1
1875	2	5	5
1876	1	4	5
Total	8	10	11

The Chief Engineer epitomizes the result of these operations in his Special Report of 1877, as follows :—

" It is evident that from Tête Jaune Cache two courses only are open for the railway, the one in a north-westerly direction by the Fraser, the other, due south by the Albreda and the River Thompson. By either of these two routes, the lofty and defiant Cariboo Mountains may be flanked, and the great plateau in the interior reached. From this central plateau eleven routes diverge through depressions in the formidable Cascade range to seven distinct harbours on the Pacific coast."

At this stage the Admiralty appears to have been applied to (in November, 1876), for information in respect of the character of the harbours referred to. Respecting this, the Chief Engineer makes use of the following language : " In the search after reliable information upon the features of the coast line of British Columbia, it was considered that the officers of Her Majesty's navy, who had served on the North Pacific Station, must have had repeated occasions to examine that coast, and more than any other class must possess that information *without which no harbour should be selected as* the water terminus of the line."

It is a matter of surprise that the application for this information was not made at an earlier date. The opinions expressed by Her Majesty's naval officers are so strongly in favour of Burrard's Inlet and so adverse to the more northerly harbours, that the possession of their opinions at an earlier period might, and probably would, have saved the cost of many expensive surveying parties made in connection with these objective points.

When it is borne in mind that an average instrumental party involved an outlay of some $30,000, and an average exploration, from $8,000 to

$9,000, it will be seen that the omission of these surveys would have saved a large amount of money.

During this triennial period, Bute Inlet appears to have been regarded as a probable terminus. To this end the contract granted to Mr. Barnard to build a telegraph line from Edmonton, along the located line of railway, to the existing telegraph system of British Columbia, was virtually suspended, and the contractor instructed to proceed from Tête Jaune Cache to Fort George.

As compared with Burrard Inlet, the position of Bute Inlet, as a terminal harbour, is, according to evidence, far inferior.

If the Seymour Narrows which separate the Island of Vancouver from the mainland were capable of being bridged at a reasonable outlay, the Bute Inlet route would become one worthy of consideration, as the only one which would permit of unbroken railroad communication to the Pacific harbours of the Island.

But, in 1872, an examination of this locality was made by Mr. Gamsby, and in 1874 the Chief Engineer reported as follows :—

" Careful examination has established the fact that to reach Vancouver Island from the mainland the following clear span bridges would be required :

	Feet.
At Arran Rapids, clear span	1,100
" Cardero Channel, 1st opening	1,350
" " " 2nd "	1,140
" " " 3rd "	640
" Middle Channel	1,100
" Seymour Narrows, 1st opening	1,200
" " " 2nd "	1,350

" The channels to be bridged are of great depth, with the tide flowing from four to nine knots an hour."

Mr. Fleming, in another place, characterizes the bridging " as not only formidable but without precedent." He also states that, " a great number of tunnels, varying from 100 to 3,000 feet in length, would be indispensable between Waddington Harbour and the entrance to Bute Inlet.

In view of these facts which were known in 1873, before any surveys had been made to points on the coast north of Bute Inlet, and in view of

the character of the navigation and the unsuitability of the more northerly harbours which, if not known, ought to have been ascertained, as the Chief Engineer himself explicitly admits in his special report of 1877, "before any "harbour should be selected as the water terminus of the line," and consequently before any expense in elaborate surveys in that direction was incurred, we think that the surveys of some of the eleven routes to the sea described by Mr. Fleming in his report of 1877, might have been well omitted.

At page 73, Mr. Fleming uses this language: "In considering the question of route in connection with that of the water terminus, the enquiry may be narrowed down, by rejecting all the projected lines and harbours except the most promising and important."

The tenor of Mr. Fleming's report is that the information derived from the Admiralty enabled the Engineering Department to see more clearly than before, the expediency or inexpediency of carrying the railway to any particular one of the several harbours to which surveys on land had been made, and that some, at all events, of these harbours were altogether ineligible. We think it is to be regretted that the enquiry was not, in Mr. Fleming's words, "narrowed down" before large expenses were incurred on those surveys which for nautical reasons were futile.

Without assuming to particularize the individual routes which would have been known to be unnecessary had the information from the Admiralty been obtained before they were undertaken, we feel obliged to say that it was under the circumstances a duty to learn, in the early stages of the surveys, all that could be communicated from such an authentic source, and that no expense should have been incurred in running lines to those points which from their nature were impossible as termini.

In the table at the end of our report on engineering we have shown separately the various explorations and surveys directed to Burrard Inlet, as distinguished from those to more northerly points on the Pacific coast, as well as the probable cost of them.

Those to Burrard Inlet are stated at $797,236; to other harbours, $968,090. These figures are not given as exactly correct, but are based upon an average assumed to be applicable to the several kinds of examinations, as explained in a note to that table.

We have, in dealing with the first triennial period, mentioned that our judgment was against the system adopted at the beginning, of examining

the country generally by instrumental surveys rather than by simple explorations, but we have to say that the mistake of using instrumental surveys too freely was not confined to the first year or period of the surveys. We think the evidence shows that bare explorations have given information to the Engineering Department which was of great value, and, indeed, more reliable than it was on different occasions considered to be by the Chief Engineer. In 1874, a line was explored by Mr. Horetzky from Gardner Inlet across the Cascade range to Lake François, heights being taken by barometer only. This examination, according to Mr. Marcus Smith (page 175, in the Chief Engineer's report of 1877), "gave no promise of a practicable line."

In 1875, however, an instrumental survey was undertaken of the same route. We have seen the original profile of the line followed on this occasion.

A regular instrumental survey was made from Gardner Inlet up the Valley of the Kimano River to Lake François, on the east side of the Cascades, a distance of twenty-two miles.

From Gardner Inlet the line for the first nine miles runs up the valley of the Kimano, which is about half-a-mile in width, and is hemmed in between high precipitous mountains on either side, and rises by easy grades to the base of the mountain, 166 feet above the sea.

In the next ten miles the line abruptly ascends the face of the mountain defile at the rate of about 400 feet to a mile, to a pond on the summit, 4,019 feet above the sea. It then descends in about three miles to the level of Lake François, which is 2,776 feet above the sea, at the rate of 413 feet per mile.

A regular profile is given of this instrumental survey, with all the levels marked upon it in the most formal manner, as if dealing with a practicable line, and a projected tunnel twelve miles in length through the mountain range, ascending from the valley of the Kimano to Lake François at the rate of 238 feet in a mile.

The general features of the country through which this instrumental survey was made are so pronounced, and so well described in Mr. Horetzky's report of November, 1874, which appeared in that of the Chief Engineer for 1877, that we think it ought to have been evident, before the expedition was started, that no result could be reached beyond showing that

a railway on that line was not feasible, and that the consequence would be, as it was, no better than a waste of time and money.

Similarly in 1874, Mr. Horetzky, whose explorations were clearly conducted with much care and correctness, examined a route through the Cascade range from a lake on its eastern slope, to which he gave the name of Tochquonyala, thence westerly through a pass into the valley of the Kitlope River, and towards its mouth at the Gardner Inlet. In his report of this expedition he gives the respective elevations of the pass and of a portion of the valley near it, showing such a sudden fall (about 300 feet per mile for six miles) as to make a railway on that route impracticable; his language is: "I think the inference may be safely drawn that in this quarter no practicable route is to be looked for." An instrumental examination of this route was, nevertheless, ordered, and though the service was a hazardous one, Mr. Gamsby volunteered and was directed to undertake it. Early in 1876, he proceeded with a party to Gardner Channel. Some account of this expedition is found at page 176 of Mr. Fleming's report of 1877, and a more detailed account by Mr. Gamsby himself, commences at page 177.

The conclusions given by Mr. Gamsby are based on the supposition that some of his party reached the lake described as existing on the eastern slope of the Cascade range, and to which Mr. Horetzky had given the name of Tochquonyala, and he assumes to contradict the substance of Mr. Horetzky's report as to the height of the said lake, and the pass between it and the River Kitlope. The evidence shows as a matter of fact; and, although the latitude and the altitude of Mr. Horetzky's points, as well as a sketch of his route, had been given to Mr. Gamsby's party, that the latter gentleman failed to reach the objective points of his expedition. He assumed others at much lower elevations respectively, to be those he was instructed to find. The result of the expedition was unequivocal failure, without any advantage to compensate, in our opinion, for the expense unnecessarily incurred in projecting it.

The last triennal period, 1877-78-79, was devoted mainly to location in the west and construction in the east. The subject of surveys in the first triennial period—of location in the second—are such as elicit, in the consideration of them, various and often conflicting views. Involving as

these subjects do, questions of route, theories as to the modes of survey, the adequacy or the inadequacy of the means at the disposal of the Department, they open up a wide field of controversy. The subject is a large one; but all these matters having been finally decided, and definite action thereupon begun, the consideration of the propriety of official action thereafter is restricted within narrower limits. There remains, therefore, but little to be said in respect of the transactions of 1877–78–79. There were in all, during this period, fourteen explorations and twenty-five instrumental surveys. The parties were distributed as follows:—

	Explorations.	Instrumental Surveys.
Mountain Region	8	11
Prairie Region	5	3
Woodland, west of Nipigon	....	4
Woodland, east of Nipigon	1	7
Total	14	25

In the mountain region the instrumental surveys, eleven in number, were, with one exception, confined to the Burrard Inlet route. Seven trial locations, covering the entire 493 miles, being made in 1877; three revised locations covering that portion of the line between Yale and Kamloops, in 1878, and a trial location along the Skeena in 1879. Of the eight explorations during the same period, two were made in 1877, and six in 1879.

They were as follows, during 1877:—

1. Exploration from Fort Simpson *via* Skeena River to Fort George, by Mr. Cambie.

2. Exploration from Fort George through Pine River Pass, by Mr. Hunter.

During 1879:—

3 Exploration by Mr. Cambie.
4 " by Mr. McLeod.
5 " by Mr. Horetzky.
6 " by Mr. Dawson.
7 " by Rev. D. M. Gordon.
8 " by Mr. Hunter.

The object of these examinations, with the exception of Mr. Hunter's explorations in Vancouver Island, was to obtain definite data to determine

whether a northern route could be found, by Peace or Pine River, to Port Simpson.

The result was to confirm the general route projected during the first and second year's surveys *vid* the valleys of the North Thompson and Fraser Rivers to Burrard Inlet, for a portion of which, tenders for construction were invited during the fall of the same year (1879).

In the prairie region, surveys by Mr. Lucas were made in 1877, between Selkirk and the South Branch of the Saskatchewan, for an alternative line; and an exploration by Mr. Marcus Smith to Lac la Biche and other points to the north of the Main Saskatchewan. No operations were undertaken in this region during 1878. Four explorations by Messrs. Eberts, Dr. Smith, D. C. O'Keefe and Professor Macoun were undertaken during 1879, with a view to obtaining a more extended knowledge of the characteristics of the various districts lying between Fort Garry and the Rocky Mountains. An exploratory survey was also made by Mr. Marcus Smith from Fort Ellice to the western boundary of Manitoba, and a second one by Mr. Murdoch, both in connection with the second 100 miles west of Winnipeg

In the woodland region the following explorations and surveys took place during 1877-78-79:—

	West of Nipigon.		East of Nipigon.			
	Exploratory Survey.	Revised Location.	Exploration.	Exploratory Surveys.	Revised Surveys.	Trial Location.
1877				3		
1878		3			1	
1879	1		1	2		1
	1	3	1	5	1	1

Of the parties engaged west of Nipigon, three were engaged during 1878, in revising the location of the 185 miles between English River and Keewatin, known as sections 41 and 42, both of which sections were placed under contract during March, 1879. An exploratory survey was also made between Thunder Bay and Nipigon.

East of Nipigon the following operations took place, viz :—

In 1877, three instrumental surveys were made from French River, two westerly and one easterly.

In 1878, one revised survey in connection with the Canada Central Railway.

In 1879, Mr. Austin ran a line from Callander, north-westerly some sixty-three miles, with which an exploration by Mr. Brunel, *viâ* Spanish River to Sturgeon River, made the same year, connected.

A survey of French River was also made by Mr. Bender.

The expenditure for the third triennial period, on account of surveys, was $754,793.

Since the inception of the surveys some thirty-four parties in all were engaged (*i.e.* several each year) in examining the country between Thunder Bay and the Ottawa; of these but six are described as explorations. If the cost of these parties was up to the average, this portion of the survey cannot have cost less than $850,000.

This is the territory respecting which Mr. Fleming reports in 1872 that, "No serious enginering difficulties have been met with in passing from the valley of the Ottawa to the country north of Lake Superior."

The general direction of a practicable route having been ascertained (which we think might have been done by well directed explorations requiring an outlay of from $8,000 to $10,000 each), there would seem to have been no necessity for this further lavish expenditure, until construction having been decided upon, a definite location was required. In 1877, the section of railway between Cross Lake and Rat Portage, some thirty-seven miles, was placed under contract, and later on in the same year the extension of the Pembina Branch northward, from Winnipeg to Selkirk, was entered upon.

Both these contracts exceeded the estimated cost very largely. The excess in the latter case arose in part from other than engineering causes, and the matter is more fully dealt with under the head of the individual contract (5*a*). The greatly increased cost of the former, arose mainly from the fact that the quantities contained in the bill of works offered to tenderers were not even approximately ascertained. This feature has already been reported upon. Inasmuch, however, as a portion of the increased cost was

due to a change in the method of construction, a few words on this point may be advisable.

Tenders were invited for the construction of this section at three several times. The bill of works and specifications in each case contemplated a different mode of construction. The first provided for the cuttings approximately balancing the fills, resulting in a solid rock and earth road-bed throughout the entire length of the section. The estimated cost, however, was so great that this proposition was abandoned after the tenders were received, and a second advertisement was issued inviting tenders for the work upon the plan of a higher grade, the material from the cuttings to be used in filling the intervening gaps as far as they would do so, but not providing for further means of crossing the open spaces. Tenders were duly received, but none of them were accepted. A third advertisement was inserted in the fall of the year 1876, inviting construction upon the general plan just described, but providing, in addition, for the filling up of the land gaps with trestle-work, and the water stretches, which were numerous, with rock-cuttings, up to three feet above high-water level, and with trestle-work thereafter.

Soon after construction was entered upon, it was found that whenever the material from any cutting was in excess of the quantity required to fill the next void up to the specified height, the trestle-work would require forthwith to be erected in order to utilize the superabundant material in the next void, for which such material would be available, unless the contractor took the time and trouble necessary to move it over the natural undulation of the country; and in many cases several land voids would intervene, all of which would require to be trestled before the next water stretch could be reached. In respect of this, Mr. Whitehead stated that the proposed method of construction would have required twenty years for completion, that, in fact, it was impracticable. His views were placed before Mr. Rowan, the District Engineer, while he was being examined before us, and he said in relation thereto: "I think there is some truth in that."

When the work was offered for construction, it was thought by the Government Engineers, that very little earth could be found along the line. Mr. Ruttan, however, the contractor's engineer, as before mentioned, stated, in evidence upon this matter, that he saw, upon his first inspection of the line, that he could borrow all the material necessary for making the embankment.

Mr. Whitehead, therefore, offered to substitute earth-work for trestle-work without making any charge for extra haul. His offer was recommended by the District Engineer, and, being approved by Mr. Fleming, the Honourable the Minister of Public Works submitted a memorandum authorizing the change to His Excellency in Council for consideration.

Mr. Fleming was on the eve of taking his departure for Europe, and before leaving he saw Mr. Rowan, who was then at Ottawa, and informed him that his recommendation was approved by the Department, and that a memorandum had been submitted to Council to authorize action thereunder. Council, however, neither adopted nor rejected the proposition at that period, and Mr. Rowan, not having received any further communication, thereupon returned to Winnipeg under the impression that he was, or would be, authorized to permit the contractor to proceed with construction in the manner proposed. This change is estimated by the Supervising and District Engineer to have increased the cost of the section to the extent of from $200,000 to $260,000. The further increase of some $750,000 is considered by Mr. Carre to have been due to other causes.

His evidence on this point may be summed up in a few words, and the general tenor of the evidence of others confirms his testimony—viz., that the grades having been altered after the original quantities were estimated, the entire calculations based upon the first profile plan were inapplicable. The nature of the country, however, was such that no reliance could be placed on any calculations made from a centre line only.

Respecting this matter Mr. Fleming admits that, without cross-sectioning, the quantities arrived at would be "a mere guess." The evidence of all who have been examined shows beyond doubt that the quantities were not calculated from the cross-sections until after the contract was let; that the quantities contained in the bill of works submitted to tenderers were based upon a centre line only, and that therefore they were a mere guess.

The next sections offered for construction were those known as 41 and 42, comprising the 185 miles between the east end of contract 15, and the west end of contract 25.

Tenders were invited by advertisement in August, 1878, the time up to which they would be received being 1st January, 1879. Mr. Fleming, on being consulted by the Minister of Railways and Canals, informed him that sufficiently accurate information would not by that date be available to

enable parties to make intelligent tenders. The letting was for this reason twice postponed. As a consequence of the greater care exercised in this respect, the evidence leads to the belief that on these sections, for the first time in the history of road-bed construction on the Canadian Pacific Railway, the actual quantities and cost will, on completion, be considerably less than at first estimated. The probable reduction has, upon section 42, been stated at some $1,500,000, of which about $650,000 was expected to result from changes in location, and minor deviations effected without deterioration of the railway, and $850,000 from modified design, by which the road-bed would be less permanent in character than was originally intended.

This latter item of saving, however, is likely to be reduced, inasmuch as solid earth embankment and rock-borrow foundations have been authorized in several places, where, at the time Mr. Schreiber's evidence was given, timber structures were proposed.

Several other contracts for road-bed construction were let during this period, viz.:

Contract No. 48, August 19, 1879.
" " 60, December 23, 1879.
" " 61, February 10, 1880.
" " 62, December 23, 1879.
" " 63, December 15, 1879.
" " 66, May 3, 1880.

These contracts were entered upon only a few months—with one exception less than six months before the date of our Commission. So that very few facts, and those of but little importance, have been presented before us in respect of construction. The bulk of the evidence taken as to these contracts has been in reference to the manner of letting, etc., and will be found under the head of the individual contracts.

One thing forces itself upon one's attention, however, in respect of the British Columbia contracts, namely, that though Mr. Marcus Smith had reported the route along the canyons of the Lower Fraser as requiring such heavy work as to be almost impracticable, it has really, after careful location, been let at a price no higher than that portion of the line in the woodland region between Cross Lake and Rat Portage.

It has been our duty to animadvert unfavourably in several instances, upon the engineering branch of the Department of Public Works having

charge of the surveying operations. It is with pleasure that we state that, during construction, the engineers have shown ability, zeal, and the strictest integrity in the supervision of the work.

The evidence shows that they fought inch by inch, and day by day, against what they thought to be attempted encroachments on the part of the contractors' engineers. We have felt that their determination to maintain the rights entrusted to their keeping, has in some cases led them to a strained construction of the specifications adverse to the contractors. Appeals were more than once made to the Chief Engineer or other superior officer by the contractor, which resulted in an interpretation more favourable to the contractor than the resident engineer was willing, without such authority, to allow.

Before closing our review of the engineering, it is our duty to call attention to serious difficulties which were always in the way of complete success in this branch of the undertaking.

Owing to the extent of each year's operations depending on the amount of money to be voted for that purpose at each session of Parliament, it was impossible to settle definitely upon the whole work to be undertaken until after the votes had passed, and to this may be partially attributed the fact, that the spring was frequently well advanced before many of the parties were definitely organized and took the field, the exception being those who had wintered out, and whose work, having been fixed the previous year, could be commenced without waiting for new arrangements at Ottawa. We think that the amount of work accomplished each season by the engineering force was not so great as it would have been, could the Chief Engineer have known, that whatever was expedient to be done might be arranged for unconditionally, and as early as was necessary to secure success.

Another difficulty was the composition of the staff of the several parties; this was frequently effected with but slight consideration as to the fitness of the persons.

Mr. Fleming's evidence is unequivocal upon the fact, and the consequences of places under him having been filled by political patronage. He testified decidedly that a private company, being free from this difficulty, could accomplish the work more efficiently and at a smaller cost than the Government. He said that in this case "men often had to be employed who were not too efficient;" meaning, as

we understood him, that they were not as efficient as they ought to have been; and he said they were selected not solely on their merits; that different nationalities and creeds had to be consulted under every administration, more especially on the engineering staff; that these, though the appointments were nominally by himself, as superior officer, were, in fact, invariably made by the Minister; and on being asked whether or not he had assumed to suspend or remove persons for inefficiency, he said he felt that persons employed through political influence, had to be kept at work unless for something notoriously wrong. He reached the conclusion, and retained it from year to year throughout, that because of persons being employed for political reasons, the work could have been done much more cheaply by a private company. He said he knew that patronage had to be respected, but he could not say that at any time he had brought this feature of the transaction to the attention of any Minister; and that until asked by us on the subject, no Minister or member of Parliament had put the question to him plainly. He remembered on one occasion representing to the Minister, that a proposed appointment was not likely to be a good one in the public interest. He gave us no name, but he said the person was appointed and turned out to be inefficient. In many other instances, when he did not remonstrate, persons frequently got positions which they where not well fitted to fill. And he said it was not easy to get inefficient men weeded out when once appointed. He added that he had no doubt that the public interest had suffered on account of the patronage being in the hands of a political party. Considering the tenor of this evidence, and the fact that instrumental surveys were frequently undertaken, where, in our view of the evidence, they might have been better omitted, we find it difficult to repress the suspicion, that various staffs having been filled from the influence thus described by Mr. Fleming, work was sometimes invented for their occupation, as an alternative less embarrassing than ending their employment.

Another serious drawback existed which was not due to the system but to individual circumstances. During the whole time that Mr. Fleming was the Chief Engineer of this railway, he was never enabled to give his undivided attention to it. For the first five of his nine years' service he was filling also the position of Chief Engineer to the Intercolonial Railway. That state of affairs ceased in 1876, and he testified that if he had not had both railways to superintend, he would undoubtedly have been able to visit the works on the Pacific Railway which the evidence shows he had

not done. After he was free from the Intercolonial Railway his health was so weakened that it led him to apply for leave of absence, and he was granted a year. He was recalled, however, before he got the benefit of this full term, and then returned the following summer to make it up. During three years after his release from the Intercolonial, he was absent on leave about nineteen months in Europe, and on another occasion he was in England on duty in connection principally with the purchase of steel rails. Thus it will be seen that throughout the period in which he held the position of Chief Engineer, he was not able to give much more than half his time to the active management of the engineering branch of the Canadian Pacific Railway. In our judgment this officer was overtaxed.

In view of this fact, and the impossibility of excluding political influence from the appointment of those who were to be nominally under his command, and the palpable truth that the different steps in a large Government work are not always devised with the sole object of pecuniary results, it must be admitted that the same success was not to be looked for in the engineering of the Canadian Pacific Railway, as might have been expected if the undertaking had been one, in which private funds alone were invested with a view to ultimate profit.

Analysis of Surveys, Canadian Pacific Railway, 1871 to 1879.*

Year.	In British Columbia.												Prairie.						Woodland Region.												Total.						Total Surveys of all kinds.	Amount Expended.
	Towards Burrard Inlet.						To other Points.												West of Nipigon.						East of Nipigon.													
	Explorations.	Exploratory Surveys, Instrumental.	Revised Surveys.	Trial Locations.	Location Surveys.	Revised Locations.	Explorations.	Exploratory Surveys, Instrumental.	Revised Surveys.	Trial Locations.	Location Surveys.	Revised Locations.	Explorations.	Exploratory Surveys, Instrumental.	Revised Surveys.	Trial Locations.	Location Surveys.	Revised Locations.	Explorations.	Exploratory Surveys, Instrumental.	Revised Surveys.	Trial Locations.	Location Surveys.	Revised Locations.	Explorations.	Exploratory Surveys, Instrumental.	Revised Surveys.	Trial Locations.	Location Surveys.	Revised Locations.	Explorations.	Exploratory Surveys, Instrumental.	Revised Surveys.	Trial Locations.	Location Surveys.	Revised Locations.		
																																				$ cts.
1871	...	6	...	...	...	...	1	.....	...	...	...	...	1	.....	...	...	...	...	...	4	...	...	...	...	1	8	...	...	...	...	2	18	...	...	...	...	20	519,576 48
1872	1	6	...	...	...	...	1	5	...	...	...	...	1	.....	...	...	...	...	1	4	...	...	...	...	1	4	...	...	...	...	5	19	...	...	...	...	24	561,818 44
1873	1	.....	...	...	...	...	...	2	...	...	...	...	1	1	...	...	...	...	...	7	...	...	...	...	1	2	...	...	...	...	2	12	...	...	...	...	14	310,224 88
1874	...	4	2	...	...	...	5	1	1	...	...	...	1	3	...	...	1	...	...	3	...	3	1	...	...	5	...	...	...	...	6	16	3	3	2	...	30	474,529 19
1875	...	.....	...	...	1	...	2	5	...	4	1	...	2	2	...	...	1	...	...	6	...	...	3	1	1	1	...	...	...	...	5	14	...	4	3	...	26	791,121 19
1876	...	.....	...	...	...	1	1	4	...	4	...	1	1	2	...	...	2	...	1	.....	...	...	3	1	2	.....	...	...	1	...	5	6	...	8	3	2	24	754,624 57
1877	...	.....	...	7	...	...	2	.....	...	...	...	...	1	1	...	...	...	...	...	.....	...	...	...	...	...	3	...	...	...	...	3	4	...	7	...	...	14	322,695 42
1878	...	..	...	...	...	3	...	.....	...	...	...	...	...	.....	...	...	...	...	...	.....	...	...	...	3	...	.....	1	...	...	...	...	.....	1	...	...	6	7	281,123 92
1879	...	.....	...	...	...	...	6	.....	...	1	...	...	4	2	...	...	...	...	...	1	...	...	...	...	1	2	...	1	...	...	11	5	...	2	...	...	18	150,973 68
	2	16	2	7	1	4	17	17	1	9	1	1	12	11	...	...	4	...	2	25	...	6	2	3	6	25	1	2	...	...	39	94	4	24	8	8	177	4,166,687 77
1871-72-73	2	12	...	...	...	...	1	7	...	...	...	...	3	1	...	...	...	...	1	15	...	...	...	...	2	14	...	...	...	...	9	49	...	...	...	...	58	1,391,619 80
1874-75-76	...	4	2	...	1	1	8	10	1	8	1	1	4	7	...	...	4	...	1	9	...	6	2	...	3	6	...	1	...	...	16	36	3	15	8	2	80	2,020,274 95
1877-78-79	...	.....	...	7	...	3	8	.....	...	1	...	...	5	3	...	...	...	...	...	1	...	...	...	3	1	5	1	1	...	...	14	9	1	9	...	6	39	754,793 02
Estimated cost	$797,236						$968,090						$526,467						$998,188						$876,706						$4,166,687						4,166,187 77

• It has been elicited by the evidence of various engineers who have been examined, that the different kinds of parties compared relatively as to numbers, as follows:—

Explorations	10 men.
Exploratory Surveys and Revised Surveys	40 do
Trial Locations	30 do
Location Surveys and Revised Locations	20 do

In making the calculation as to the proportionate cost properly chargeable against each district, the following data have been adopted:—

Exploration, = 1.
Exploratory and Revised Surveys, (1 × 4) = 4.
Trial Locations, (1 × 3) = 3.
Location Surveys and Revised Locations, (1 × 2) = 2.

The cost of each exploration, on this basis, is as follows:—

During 1871-72-73	$6,788 38
do 1874-75-76	8,524 36
do 1877-78-79	8,116 05

Hence the cost of the remaining surveys are approximately ascertained by multiplying these amounts by 4, 3 or 2 respectively, according to the character of the survey; and on that basis the results given upon the accompanying table are arrived at.

Detailed Statement of Explorations and Surveys, 1871 to 1879.

1871

District.	Engineer in Charge.	Description of Survey.	Initial Point.	Objective Point.	Remarks.
Mountain.	R. McLennan	Instrumental	Kamloops	Yellowhead	Via Albreda and Cranberry Lakes.
	do	do	Quesnelle Mouth	Tête Jaune Cache	Through Cariboo District.
	W. Moberley	do	Shuswap Lake	Big Eddy	Via Eagle Pass and thence to the Boat Encampment.
	do	do	River Columbia	Kootenay Plains	Via Blaeberry River and Howse Pass.
	J. Trutch	do	Lytton	Shuswap Lake	Via Frazer and South Thompson Rivers.
	do	do	Yale	Lytton	By Frazer River.
Prairie.	F. Moberley	Exploration	Fort Garry	Rocky Mountains	
Woodland.	Lloyd	Instrumental	Mattawa	Confluence of Montreal & Ottawa Rivers	
	O'Hanly	do	Ottawa River	Head of Montreal River	
	Austin	do	Montreal River	Halfway to West Branch of Moose River	
	Gamsby	do	Last named point	Moose River	
	McConnell	do	Moose River	Small Black River	
	Armstrong	do	Small Black River	Long Lake	
	Johnstone	do	Long Lake	Mouth of Nipigon	
	J. Fleming	do	Nepigon	Lac des Iles	
	Carre	do	Lac des Iles	Canoe route to Lac Seul	
	James	do	Canoe Route	Lake of the Woods	
	Jarvis	do	Whitefish Bay, Lake of the Woods	Red River	
	Murdoch	do	Sault Ste. Marie	French River	
	A. McKenzie	Exploration	Ottawa River	North to James' Bay	Via Moose and Michipicoten River.

1872

	S. Fleming	Exploration	Jaspar Valley	Port Moody	Via Thompson Valley, including exploration of approaches to Athabaska and Howse Passes.
	R. McLennan	Instrumental Survey	Lake William	Head of Quesnelle Lake	Along south shore.

	do	do	do	*Junction of Clearwater and North Thompson River*	Via River Horsefly and Lakes Cainim and Mahood.
Mountain.	W. Moberley	do	Jaspar Valley	Tête Jaune Cache	Through Yellowhead Pass.
	do	do	Tête Jaune Cache	River North Thompson	Via Cranberry and Albreda Lakes.
	John Trutch	do	North Thompson River	Kamloops	Whole length.
	do	do	Junction of Clearwater	Near Lake William	
	W. O. Tiedeman	do	Waddington Harbor	River Frazer	
	C. H. Gamsby	do	do	Seymour Narrows	
	C. E. Michaud	do	Hope	Summit of Coquihalla Pass	
	John Trutch	do	Coquihalla Pass	Lake Nicola	
	do	do	Lake Nicola	Kamloops	
	C. Horetzky	Exploration			Between Peace and Skeena Rivers, north of 54th parallel.
Prairie.	S. Fleming	do	Lake of the Woods	Rocky Mountains	
Woodland.	W. Murdoch	do	do	Nipigon	
	Kirkpatrick	do	River Nipigon	North End of Long Lake	
	A. Hamilton	Instrumental Survey	Mattawa	Confluence of Ottawa & Montreal Rivers	Continuation of Lloyd's survey of 1871.
	O'Hanly	do	River Ottawa	Great Bend of River Montreal	do 1871 survey.
	J. Armstrong	do	North end of Long Lake	65 miles north Lake Michipicoten.	
	J. G. Johnstone	do	do	North side Lake Nepigon	
	E. H. Keating	do	North of Lake Nipigon	Sturgeon Lake	
	E. W. Jarvis	do	Eagle Lake	do	
	W. A. Austin	do	Nepigon Northward	To Main Line	
	W. Murdoch	do	Thunder Bay	do	

1873

Prairie. Mountain.	W. Moberley	Instrumental Survey	Moose Lake	Along South Bank of River Frazer	
	E. W. Jarvis	do	Howe Sound	North Thompson / do	Via Rivers Green, Scalux, Frazer and Bonaparte.
	C. H. Gamsby	do	do		
	M. Smith	Exploration	Lac la Hache	River Horsefly	Towards Lake Clearwater.
	A. R. C. Selwyn	do	Lake Winnipeg	Rocky Mountain House	Along River Saskatchewan.
	H. B. Smith	Instrumental Survey	Portages between Lakes Cedar, Winnipegoosis and Manitoba.		
Woodland.	W. W. Austin	do	Lake Nipissing	Ma-tug-a-ma	
	W. W. Kirkpatrick	do	North end of Long Lake	River Nipigon	Via S. E. angle of Lake Nipigon.
	J. E. Dickinson	do	Lake Helen, River Nipigon and Nipigon Harbor		
	do	do	Navigable portion of River Kaministiquia		
	H. J. Mortimer	do	River Nipigon	Black Sturgeon Lake	
	H. Carre	do	Black Sturgeon Lake	Chiefs Bay, Nipigon	
	R. D. McConnell	do	Chiefs Bay	Gull River	
	H. P. Bell	do	Whitefish Lake	Sturgeon Lake	
	W. Murdoch	do	do	Sandy Lake	

Detailed Statement of Explorations and Surveys, 1871 to 1879—*Continued.*

1874

District.	Engineer in Charge.	Description of Survey.	Initial Point.	Objective Point.	Remarks.
Mountain.	Jos. Hunter	Instrumental	Clearwater River	River Thompson	Via Blue River.
	E. W. Jarvis	do	do	Tête Jaune Cache	
	H. J. Cambie	do	Coquehalla Pass		
	J. Trutch	do	Similkameen Valley		
	do	do	Hope	Burrard Inlet	Via Frazer River.
	J. Hunter	Revised survey	Yale	Towards Lytton	
	E. W. Jarvis	Instrumental	Thompson Valley	Bute Inlet	Section of route.
	Jarvis, Bell & Gamsby	do	Tête Jaune Cache	Lake Tatla	Via Fort George and River Chilcoah.
	M. Smith	Exploration	North Coast of Vancouver Island		
	C. Horetzsky	do	Dean and Gardner Inlets	Eastern slopes of Cascades	
	M. Smith	do	River Blackwater	Lake Francois	Via Salmon River and east flank of Cascades
	J. Hunter	do	Lake Francois	Around the Lake	
	Smith & Hunter	do	do	Fort George	Via Rivers Stilacoh, Nechaco and Stewart.
Prairie.	E. P. Bender	Instrumental	Narrows of Lake Manitoba and River Saskatchewan		
	do	do	For projected canal between Winnipegoosis and Manitoba Lakes.		
	McLeod & Cunningham	do	Selkirk	Livingstone	Via Narrows of Lake Manitoba.
	A. R. C. Selwyn	Exploration	Borings		For fuel and water.
	H. A. F. McLeod	Instrumental boring.	Livingstone	Easterly	
Woodland.	Brunel & Mortimer	Location survey	Emerson	Fort Garry	
	S Hazlewood	Instrumental	French River	River Ottawa	
	Hazlewood & Bell	do	Parry Sound	Ottawa	Via Carleton Place.
	Brunel & Mortimer	do	Harbor Mouth of French Riv.		
	W. A. Austin	do	Pic River	Lake Missanabe	
	H. J. Mortimer	do	Portage, Dawson Route		
	W. Murdoch	do	Thunder Bay	Lake Shebandowan	
	H. A. F. McLeod	do	Rat Portage	Lake Vermillion	
	W. W. Kirkpatrick	do	Lake Wabigoon	English River	
	H. Carre	Trial location	Selkirk	Rat Portage	
	T. J. Thompson	Instrumental survey.	Nipigon River	River Pic	
	W. Murdoch	Trial location	Thunder Bay	Lake Shebandowan	

1875

Mountain.	E. W. Jarvis	Exploration	Upper Frazer River	Edmonton	Via Smoky River Pass.
	H. J. Cambie	do	Homathco River	Easterly	By East Branch.
	C. H. Gamsby	Location survey	Bute Inlet	Mouth of East Branch of River Homathco	
	H. J. Cambie	Trial location	East Branch of Homathco	Lake Tatla	Via Lake Tatlayaco.
	H. P. Bell	do	Central Plateau	River Blackwater	Via River Nazco.
	do	do	River Blackwater	Near Fort George	Via Chilcoah and Stewart Rivers.
	do	Instrumental	Along Rivers Stewart and Frazer		
	G. A. Keefer	Location survey	Yellow Head Pass	Tête Jaune Cache	
	Jos. Hunter	Instrumental	Dean Channel	Blackwater Valley	By Salmon River.
	C. Horetzsky & Trutch	do	Kemano Bay	to East slope of Cascades	
	J. Trutch	do	Vancouver Island Line		
Prairie.	Harris, J. Hunter	do	Esquimalt	Nanaimo	
	McLeod, D. E. R. Lucas	Location survey, do	Selkirk	Livingstone	Subsequently made exploration from Livingstone to Jaspar Valley.
	McLeod	Exploration	Rivers Maligne and Rocky	towards River Brazeau	
	D. E. R. Lucas	Instrumental	Livingstone	Battleford	
	H. N. Ruttan	do	thence	Root River	
Woodland.	H. J. Mortimer	do	Soundings of Lakes on Dawson Route		
	E. G. Garden	do	Lake Windigoostigan	Sturgeon Falls	
	H. J. Mortimer	do	do	River Oskondiga	By Shebandowan.
	W. W. Kirkpatrick	do	Lake Manitou	Sturgeon Falls	
	do	do	Lake Vermillion	Little Wabigoon River	
	T. Ridout	do	French River		Harbour survey.
	O'Hanly	Exploration	Sault Ste. Marie	Pic River	
	Baily & Scott	Instrumental	Sunshine Creek	River Wabigoon	Via Rivers Savanne and English.

1876

Mountain.	C. H. Gamsby	Exploration	Gardner Inlet	Kitlope Valley	
	J. Trutch, G. A. Keefer, H. P. Bell	Trial location, do, do	Moose Lake	Fort George	In sections.
	D. McMillan	Instrumental	River Chilcoah	Blackwater Falls	By Western Branch.
	do, J. Hunter	do, do	Dean Channel	Mouth of Chilcoah	Via Salmon River.
	W. T. Jennings	Trial location	do	53rd mile up Salmon River	
	C. H. Gamsby	Revised location	Waddington Harbor	54th mile up Homathco	
	H. J. Cambie	do	Yale	Lytton	
	M. Smith	Instrumental	Lake Francois	South and West	

Detailed Statement of Explorations and Surveys, 1871 to 1879—*Continued.*

1876.

District.	Engineer in Charge.	Description of Survey.	Initial Point.	Objective Point.	Remarks.
Prairie.	D. E. R. Lucas	Location survey	Edmonton	River McLeod	
	do	Instrumental	River McLeod	River Athabaska	
	H. N. Ruttan	Location survey	River Myette	River Assiniboine	Via Jaspar Valley.
	do	Instrumental	River Assiniboine	Down Athabaska Valley	
	H. A. F. McLeod	Exploration	Willow Hills	Buffalo Coulée	
			River Myette	Yellow Head Pass	
Woodland.	R. McLennan	Location survey	Thunder Bay	English River	
	W. A. Austin	Trial location	English River	River Wabigoon	
	Brunel & Mortimer	do	River Wabigoon	Lake Vermillion	
	E. G. Garden	do	Lake Vermillion	Rat Portage	
	L. G. Bell	Exploration	Located line	Nepigon	By Dog Lake.
	J. L. P. O'Hanly	do	River Pic	French River	(Towards).
	Ridout & Horetzsky	do	French River	River Pic	do
	H. D. Lumsden	Trial location	Cantin's Bay, French River	Eastern terminus	do

1877.

Mountain.	H. P. Bell	Trial Location	Tête Jaune Cache	Burrard Inlet	In seven sections.
	D. McMillan				
	E. E. Perry				
	A. Brunel				
	G. A. Keefer				
	W. T. Jennings				
	C. H. Gamsby				
	H. J. Cambie	Exploration	Port Simpson	Fort George	
	Jos. Hunter	do	Pine River Pass		
Prairie.	D. E. R. Lucas	Instrumental	Selkirk	South Branch of Saskatchewan River	
	M. Smith	Exploration	North of Main Saskatchewan River		

Woodland.	F. Ridout, C. Horetzsky, H. A. F. McLeod	Instrumental	Lake Nipissing	Lake Superior	

1878.

Woodland. Mountain.	H. J. Cambie, W. T. Jennings, G. A. Keefer	Revised location	Yale	Kamloops	
	C. H. Gamsby, D. E. R. Lucas, H. D. Lumsden	do	Rat Portage	English River	
	W. Murdock	Revised survey to determine eastern terminus			

1879.

Mountain.	G. A. Keefer	Trial Location	Head of Wark Inlet	Up River Skeena	
	H. J. Cambie	Exploration	Port Simpson	Lesser Slave Lake	Via Pine River, Skeena Pass, Lake Babine and Stewart.
	H. A. F. McLeod	do	do	Battleford	Via Peace River.
	C. Horetzsky	do	Peace & Pine River District		
	Dr. G. M. Dawson	do	Geological Examination		
	Rev. D. M. Gordon	do	Port Simpson	Edmonton	Via Peace River Pass.
	Jos. Hunter	do	Vancouver Island		
	Prof. Macoun	do	Livingtone	Edmonton	South of Telegraph line and north of Latitude 51°.
	M. Eberts	do	112th Meridian eastward and north of Lac la Biche		
Prairie.	Dr. Smith	do	Lake Winnepegoosis	River Saskatchewan	North of Telegraph line.
	D. C. O'Keefe	do	North of Saskatchewan as far as Churchill River		
	M. Smith	Instrumental	Western boundary of Manitoba	Westerly 100 miles	
	Murdoch	do	Alternative line.		
Woodland.	R. McLennan, C. H. Gamsby	do	Thunder Bay	Easterly	Via Long Lake.
	W. A. Austin	do	Callender	North-westerly 63 miles	
	E. P. Bender	do	French River		
	A. Brunel	Exploration	Spanish River	Sturgeon River	To connect with W. A. Austin.