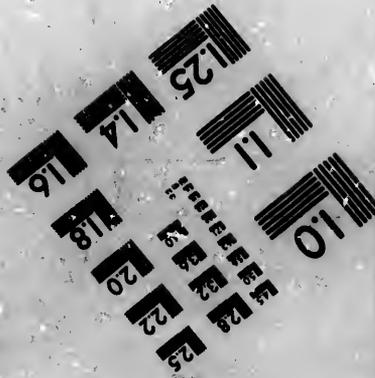
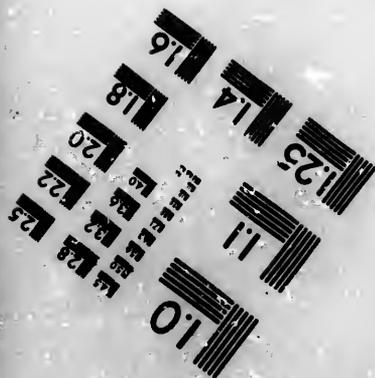
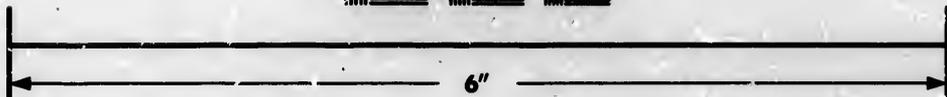
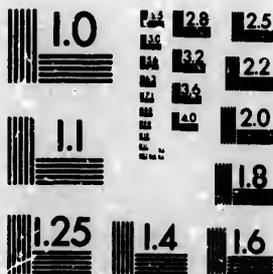


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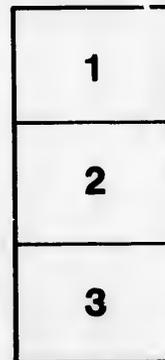
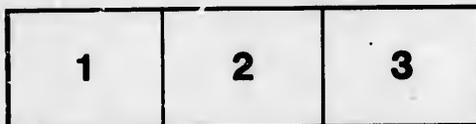
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SUGGESTIONS
ON THE
INTER-COLONIAL RAILWAY,
AND THE CONSTRUCTION OF A
HIGHWAY AND TELEGRAPH LINE
BETWEEN THE
ATLANTIC AND PACIFIC OCEANS,
WITHIN BRITISH TERRITORY,

RESPECTFULLY SUBMITTED TO THE GOVERNMENT OF CANADA,

BY
SANFORD FLEMING,
TORONTO, AUGUST 5TH, 1862.

W. C. CHEWETT & CO., KING STREET EAST.
1862.

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SUGGESTIONS
ON THE SUBJECT OF THE
PROPOSED INTER-COLONIAL RAILWAY,
TO CONNECT HALIFAX WITH QUEBEC;
TOGETHER WITH OBSERVATIONS ON THE
CONSTRUCTION OF AN UNBROKEN LINE OF COMMUNICATION
BETWEEN THE ATLANTIC AND PACIFIC OCEANS,
WITHIN BRITISH TERRITORY.

The connection of Halifax in Nova Scotia, with the railway system of Canada, and the establishment of a great highway for commerce and colonization through the interior of British North America, from the waters of the Atlantic to those of the Pacific, are undoubtedly projects of great interest. The construction of an unbroken line of communication between the two oceans within British Territory, is a subject which for some time back has engaged the attention of many on both sides of the Atlantic; and judging from recent discussions in parliament, as well as certain movements made during the past year by the representatives of the Imperial and Provincial Governments, with the view of supplying the link required to complete the connection between Halifax and Quebec, it

is quite obvious that time is ripening one or both projects for deliberate consideration, and, it is to be hoped, for comprehensive action.

It may seem presumptuous on the part of the writer to volunteer suggestions on the subjects above referred to, but it becomes the duty of every man, however humble he may be, to give utterance to his reflections on matters of a public nature, so that the truth may be arrived at; and as the questions alluded to, have to some extent, occupied the attention of the writer, he ventures to accept a seasonable opportunity of expressing his ideas, however valueless they may prove, even at the risk of being considered over zealous.

If, then, so humble an individual might be allowed an opportunity of offering his views, in as brief a manner as the extent of the subject will allow, the writer would respectfully submit the following observations and suggestions.

The question of opening a continuous line of communication across the continent, is acknowledged to be of Imperial as well as of Provincial interest. The Provinces are interested in the undertaking in a two-fold manner—firstly, as distinct portions of the country under separate governments they would benefit by the work so far as it served the purposes of colonization and commerce within the limits of each—and secondly, as component parts of the American Division of the Colonial Empire they would each partake of the advantages

it conferred on the whole. On the other hand, the Imperial Government have undoubtedly high objects to attain by an undertaking of this character, as it would serve as a bond of union between all the possessions on the Atlantic and Pacific coasts as well as the intervening territory, and tend in no small degree to perpetuate the continuity of the British Empire on this continent. Moreover, fully one-half of the whole extent of country to be traversed is still beyond the control of any of the Provincial Governments, and therefore any measure affecting that portion can only be dealt with by the Imperial authorities.

The Imperial Government, in a despatch dated 12th April, 1862, from the Colonial Secretary, have expressed their willingness to co-operate with the Provinces in "a desire to complete a perfect Inter-Colonial communication over British Territory," and in reference more particularly to that section lying between Quebec and Halifax, they have indicated the manner in which Imperial aid might be obtained, and announced that it would afford sincere gratification if the Provincial Governments would propose some practicable scheme for applying the Imperial offer to the attainment of the desired object.

The proposed communication between Halifax and Quebec, although a most important work, is only a link in a great chain, and it cannot be doubted that the policy of the Im-

perial Government with regard to the link may equally be applied and extended to the whole series.

Before attempting to show what appears a desirable mode of taking advantage of the generous offer of the Imperial Government, either in undertaking the whole work or a single section of it, the writer would respectfully submit the following preliminary and explanatory observations, which have been recently published in a small hand book entitled "A Sketch of an Overland Route to British Columbia."*

* The observations which follow are given as they were originally presented in the form of a letter to Professor Hind, the author of the work referred to.

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PRACTICAL OBSERVATIONS

ON THE CONSTRUCTION OF A CONTINUOUS

LINE OF RAILWAY FROM CANADA TO THE PACIFIC OCEAN

ON BRITISH TERRITORY,

BY SANDFORD FLEMING, ESQ., C. E.,

Engineer to the Northern Railway of Canada.

7 pre-
work

TO HENRY YOULE HIND, ESQ., Professor, &c., &c.

DEAR SIR,—According to your request, I have much pleasure in submitting the following observations on the construction of a highway, within British territory, from Canada to British Columbia.

Opening a communication for commerce between the western and eastern shores of North America, through the great basins of the St. Lawrence, the Saskatchewan, and the Columbia, has for nearly two centuries been a dream of the enthusiast. So far back as 1679 Robert Cavalier de la Sale formed to himself the magnificent scheme of opening a way to China and Japan through the Lake regions of Canada; and curious enough, the rapids and village of Lachine, near Montreal, took their names, either in honor or in derision of La Sale's project, when he set out on his grand enterprise. About fifty years later Charles Marquis de Beauharnois, Governor of New France, projected an attempt to communicate with the Pacific, and in pursuance of which Pierre Gauthier de Varennes set out in 1731 and was the first to reach the Rocky Mountains.

Of late years the project has been brought prominently before the public in England and in Canada by many writers, amongst others,

Lieut. Millington Henry Synge, R. E., in 1848; Major Robert Carmichael-Smyth, and a Mr. Wilson of the Hudson's Bay service, in 1849; Allan Macdonell, Esq., in 1850, and Captain Thomas Blakiston, R. A., in 1859. Each laid their views before the public, and warmly advocated the importance of opening up the interior of British North America by a highway from ocean to ocean.

In 1858 the Provincial Legislature of Canada incorporated a joint stock company for the purpose of opening up the interior and trading therein. This body, entitled "The North-West Transportation Navigation and Railway Company," was granted most extensive powers; besides trading in furs, tallow, buffalo meat, hides, fish-oil, and other articles of commerce, the company was empowered to improve and render navigable the various channels of water communication; to construct links of roads, tramways, and railways, between navigable lakes and rivers, so as to provide facilities for transport from the shores of Lake Superior to Fraser's River. They had likewise the right to own and employ vessels of all kinds "upon Lakes Huron and Superior, and upon all the waters, lakes and rivers lying to the northward and to the westward of the latter, thereby offering to their energy and their enterprise a new and vast field for commercial adventure." The directing board of this company was the same year fully organized, it embraced some of the leading names connected with Canada, but from some cause it has as yet made no progress in the objects contemplated.

From the above brief sketch of the history of the project of establishing a highway from Canada across the continent it appears that it has from the earliest settlement of the country bordering on the Atlantic, been considered a magnificent scheme for the extension of commerce and civilization; the Palliser expedition across the Rocky Mountains, the Assiniboine and Saskatchewan expedition, show that it has very lately received the attention of the Imperial as

well as the Colonial Governments; the recent discovery of gold on both slopes of the Rocky Mountains, gives it much additional interest, and lastly, the difficulties between the United States and Imperial Governments, for the present happily set aside, have not failed to show its vast importance as an engine of military defence.

It seems likely then, that although the means of transport for nearly 2,000 miles are as yet scarcely better than they were when La Sale attempted to traverse the continent almost two centuries ago, the time is rapidly approaching when a highway across the continent will no longer, by any one be viewed as visionary.

Before proceeding to consider the construction of the work practically it will be necessary to discuss its character, and profitable to view its magnitude.

ITS CHARACTER.

A CONTINUOUS LINE OF RAILWAY ADVOCATED.

The early French Projectors appear to have had the idea of opening a water communication to the Pacific through the lakes and rivers of Canada and the interior. Nearly all the recent writers on the subject have proposed in different ways to improve and render navigable the natural lines of water communication. I am not aware however, that any of the latter, by reason of their knowledge of the great Rocky Mountain barrier, have contemplated a route wholly by water; they have generally advocated a mixed system, employing the water channels as far as possible, and connecting them by intermediate links of roads or of railways. On the other hand, Captain Blackiston appears to be much in favor of a land route, for the present, at least from the north shore of Lake Superior to Red River, by the north end of Lake of the Woods, at some distance inland from the international boundary line; and Major Carmichael-Smyth in 1849 boldly urged the construction of a "British Colonial Rail-

way" to connect *without break* Halifax on the Atlantic with the mouth of Fraser's River on the Pacific.

All the schemes proposed may be reduced to two kinds, viz. : partly water and partly land ; and wholly land routes ; the former may possess the advantage in point of cheapness in construction, but certainly not in regard to efficiency. By using the lakes and rivers as far as navigable or capable of being made so, and by constructing connecting links of roads or railways where necessary to complete the chain, it is more than likely that a line of communication could be formed from ocean to ocean at less cost than could a continuous land route ;—a mixed land and water route would, however, be always open to the following objections : it would to a great extent, confine colonization to the banks of rivers and lakes where the soil is not invariably most suitable for cultivation. It would involve many transshipments, and be liable to frequent interruptions. It would necessarily be considerably longer than a direct land route, and, as a means of transport for "through traffic," would be slow and tedious,—it would too, and this objection is insuperable, be only available for any kind of traffic during less than six months in the year.* It is well known that serious delays frequently arise on canal navigation before the season terminates towards the close of navigation by reason of the press of business. The longer the route the greater would be these difficulties, merchants at either end, unwilling to run the risk of having goods arrested in the interior for half a year, would in consequence be debarred from sending consignments across the country for some considerable time before the water channels were completely closed, and hence it is believed that a partly land and water route would not be really serviceable for "through

* The navigation of the lakes and rivers on the line of route are closed from the middle of November to the 1st of June.—BLAKISTON.

traffic" over five months in the year. The local traffic of the interior would likewise be suspended for long periods, and at such times the country and its inhabitants would be as much isolated as they are now. In a military view alone this objection would prove fatal to any permanent route of an amphibious character; and it is probably on this ground, together with the fact that the water lines pass for a considerable way along the international boundary, that the two military gentlemen last named have extended their advocacy to a line of communication wholly by land through the interior.

A railway communication on the other hand would be the shortest practicable line that the physical features of the country would admit,—it would have no transshipments between tide water on the two oceans,—it would in most instances be carried through the heart of the country at some distance from lakes and rivers, and would thus open valuable tracts of land for colonization which could not be reached by navigable waters; when it touched or intersected water channels, these would form natural branches to it, and be available to their fullest extent in laying open the land along their banks for settlement. It would, as an essential and independent part of its equipment, be provided with an electric telegraph; the telegraph, as on other lines, would be available for purposes beyond the immediate requirements of the railway, and without doubt great benefits would result from the possession of this instantaneous means of communication.* The railway would throughout the year

* A telegraph would be much more expensive in the first place, and almost impossible to maintain on any line across the country other than a railway or other travelled land route, if carried around lakes or through hundreds of miles of uncleared forest, the wires would constantly be broken by fallen timber, and the posts frequently destroyed by running fires, inconvenient interruptions might thus occur when the telegraph was most in need. On a railway it is part of the duty of the trackmen to look out for fallen trees, and a break is thus speedily repaired when it occurs: when the line is cleared to a sufficient width interruptions from this cause are not frequent.

be open to transport "through" as well as "local" merchandise and passengers, and would, taken with the telegraph, in a military aspect be available at all times and seasons, and would undoubtedly prove an important as well as permanent measure of defence to the country.

It is not, however, to be supposed that the operating of a railway through this extensive country would be entirely free from difficulties; the permanent supply of fuel would be a question of no little moment, the intense frosts and the snow drifts of a long winter would have to be contended with. The latter is found in operating Canadian as well as other railways in a like northern latitude to be a cause of not unfrequent interruption to the regular running of trains, besides often the necessity of a heavy outlay. The drifting of snow, like all operations of nature is, however, governed by certain laws, and it is possible on a correct knowledge of them to adopt measures in the general design of railways and their appliances which may certainly diminish if they do not entirely remove the evil effects of the agency referred to. These questions will be more particularly referred to in their proper place.

Taking all things into consideration, and, notwithstanding the difficulties last mentioned, it seems as clear as a demonstration that a continuous line of railway, with its electric telegraph, extending across the continent is much to be preferred to a mixed system of navigation and railway combined, and therefore in the following observations it will be understood that a line of railway is the character of highway ultimately in view. It is true that in preparing the country for railway service the natural water channels as far as they go may be advantageously employed, but it would evidently be unwise to incur much expenditure on any route other than that best calculated to accommodate the permanent wants of the country and highest interests of the Colonial Empire.

ITS MAGNITUDE.

COST AND MAINTENANCE OF A RAILWAY AND TELEGRAPH LINE.

Having determined the character of the means of communication most desirable to be established it may be well now to glance at the comparative dimensions of the proposed work, and to consider the cost of its construction as well as the annual expense of maintaining it for ever afterwards.

Measuring on the map along the general route of the proposed line from the mouth of Fraser's River, through one of the best passes yet discovered in the Rocky Mountains, along the general direction of "the Fertile Belt," keeping south of the North Saskatchewan, crossing the Red River near the Settlement, bridging the Winnipeg River at the north end of the Lake of the Woods, striking through the country to the most northerly bend of the shore of Lake Superior, thence in a direct line to a crossing on the French River west of Lake Nipissing, and from this point connecting with the existing railway system of Canada, either at the Town of Barrie, or at Peterboro, or at the City of Ottawa; the distance thus measured will be found to be in round numbers about 2000 miles, and although a railway between the two oceans on British territory, cannot be considered perfect without the completion of the road between Halifax and the most easterly extension of the Grand Trunk in Lower Canada, yet as there is some prospect of this section being made independently, it does not appear necessary to embrace its length in the present consideration.

That a just conception may be formed of the real magnitude of the project under discussion, and the means necessary to its attainment, attention may for a moment be drawn to a few leading details. The construction of 2000 miles of railway measured by the average standard of similar works existing in this country implies the performance of labourers' work sufficient to give employment to 1000

men for 50 or 60 years,—it involves the delivery of 5,000,000 cross-ties or sleepers, and over 200,000 tons of iron rails for the “permanent way”—it comprises the erection of 60,000 poles hung with 1000 tons of wire for the Telegraph—it necessitates the creation of motive power equivalent to over 50,000 horses, which power would be concentrated in 400 Locomotives—it involves the production of from 5000 to 6000 cars of all kinds, which, coupled with the locomotives, would make a single train over 30 miles in length—and lastly it implies a gross expenditure on construction and equipment, of not less than \$100,000,000.*

It will likewise serve as a salutary check on hasty conclusions to weigh before hand the cost of operating a truly gigantic establishment of the kind after its perfect completion; a few figures derived from actual results will shew that the first construction of a railway through the interior of British North America is even a less formidable undertaking than that of keeping it afterwards open in the present condition of the country. For operating the line successfully, the fuel alone required in each year, and estimated as wood, would considerably exceed 200,000 cords—for keeping the road in repair a regiment of 2000 trackmen would constantly be employed in small gangs throughout its entire length; for the same purpose there would on an average be annually required 600,000 new cross-ties as well as nearly 30,000 tons of new or re-rolled iron rails—the annual repairs of Rolling Stock would not cost less than one million dollars—over 5000 employées of all kinds would constantly be under pay, and as these men would usually represent each a family, there

* Major Carmichael-Smyth estimated the cost of building a line of railway from Halifax to the Pacific at £150,000,000 sterling, equal to over \$700,000,000. but then he computes the expenditure as on English railways, where more money has been wasted in preliminary expenses and lavished on architectural monuments at Stations than would suffice to build an equal length of road in this or any new country.

would not be far short of 20,000 souls subsisting by the operation of the road. The aggregate amount of wages in each year after the road was in operation would swell out to nearly \$2,000,000, while the gross expenditure for operating and maintaining works would annually exceed \$8,000,000.

Again, if to this last sum be added the interest on first cost, it becomes evident that until the gross earnings of the railway in each year come up to the enormous sum of \$14,000,000, it could not pay interest on the capital invested.

ITS IMPORTANCE.

A GREAT NATIONAL WORK, A FIELD FOR LABOUR, AN ENGINE OF MILITARY DEFENCE.

The above computations taken by themselves are more than sufficient to deter any one from casting a second thought on the subject of constructing a railway through the unpeopled wilds of British North America, but when we again reflect on the vast importance of this great national work the belief is forced upon us, that at some period, *let it be a remote one*, the undertaking will certainly be accomplished. While most authorities have very fully dwelt upon the commercial advantages to be attained by a speedy means of communication across the country—while they have shown its value as a connecting chain between British Columbia, the Gold Fields on the slopes of the Rocky Mountains, the Settlements at Red River, and the Atlantic Provinces, as well as a link of connection between China, India, even Australia, together with other Dependencies on the Pacific and the Parent Land—while they have advocated it as the key to a new and almost boundless field for British capital, energy and enterprise—as a great instrument of colonization, opening up a territory of vast extent for the superabundant and rapidly increasing population of the European States, and in this respect involving the future and

permanent interests of civilization—yet it has not been the good fortune of the writer to peruse any article, in which this undertaking is viewed as a most important measure of defence, as a work which may at some period save many millions sterling in carrying on a war, which may, if it does not prevent a war, save the Colonial Empire from dismemberment.

In times of Peace we are apt to overlook the importance of being able to concentrate troops and munitions of war at any given point on our extended frontier, but the recent difficulties between the British and American governments, could not fail to illustrate the military value of the several Canadian railways as well as the isolated and defenceless condition of the far interior. Had war not fortunately been avoided it is difficult to see how that vast and prospectively most valuable territory between the Lake District and the Rocky Mountains could have been protected from invasion and permanent occupation, and we are forced to the conclusion that until a highway is formed the interior of our country is indefensible. The Romans paid particular attention to the construction of roads through the distant Provinces of the Empire, and while the construction of these roads was one of the grand causes of civilization introduced into barbarous States, the great leading principle which actuated the builders of them, was that of maintaining their military supremacy, the first efforts of that people were directed to piercing new acquisitions to the Empire with good roads, and these roads wherever practicable were connected in unbroken lines with the seat of government at Rome. The remains of these roads are still to be traced in various ramifications through Europe, and so substantially were they constructed that they have for fifteen centuries perpetuated the power and foresight of their originators.

In modern times, Napoleon, one of the greatest, if not the greatest military authority, announced the maxim that the highest effort of

the military tactician was to concentrate a given number of men at a given place, at a given time. It requires no argument to prove that the Railway and the Electric Telegraph are the most perfect means for concentration of military power that could possibly be desired, and we can easily perceive with what comparative ease forces could be brought to bear through the instrumentality of these agents, on any point threatened with invasion.

True, we are again at peace with our neighbours to the south, and perhaps likely to remain in that happy state for a considerable time, but possibly not always; some good authority has laid down as a maxim, that to maintain peace, a nation must be well prepared for an opposite condition of things, and therefore we must see the value of the railway route to bind the several North American Colonies of Britain together. But it is not alone as a work of defence that the British Pacific Railway would be serviceable in a military sense; it cannot be forgotten that within a very few years back the British troops had to be transported with the greatest possible rapidity to India and again to China. Such exigencies may at any time occur again, either in the same lands or at other points in the same hemisphere, and it must be of the utmost importance to the Imperial Government to possess the means of carrying military forces more rapidly by a route over entirely British soil than by any other route along which they may come in contact with antagonistic nations.

I have already overstepped the limits of space which these preliminary remarks should have occupied, but I cannot proceed to the more practical section of this letter without first alluding to the efforts which for more than half a century have been made by the Imperial Government to discover a means of communication by water between the Northern Atlantic and the Northern Pacific Oceans. Although the persevering and sometimes heroic attempts to find a north-west passage have resulted in no direct advantage,

beyond a trifling contribution to science and geographical knowledge, yet they are undoubted evidence of the high commercial and military value which the British Government has long placed upon the possession of a means of communication between the two oceans in the northern hemisphere; and while the expenditure of a sum considerably over a million pounds sterling has only proved that a passage through the Arctic Seas cannot be established, the very impracticability of the passage which the outlay of so much treasure as well as the loss of so many valuable lives has demonstrated, must without doubt add immensely to the importance of the only practicable route across the continent, on British soil.

SCHEME OF CONSTRUCTION.

THE COMPLETION OF THE RAILWAY A WORK OF TIME.

The idea of constructing upwards of 2,000 miles of railway in the manner which has characterised the establishment of similar undertakings heretofore, through a country almost uninhabited except by scattered bands of wandering Indians, may well be viewed as a commercial absurdity. It has been shown that the maintaining and operating of a railway of this extent, after its perfect completion, would cost not less than eight million dollars per annum, and that its traffic would have to yield in gross receipts fourteen millions of dollars every year to enable the work to pay interest on the capital invested.

Could it be satisfactorily shown that these receipts might even be approached, the work would undoubtedly be a legitimate investment for private capital, and we might fairly expect to see it undertaken by private enterprise, but at present no such inducement can be held out; however important the line would be in many respects the business of the country traversed could not for many years yield more than a fractional part of the revenue required to keep it open,

and the traffic from ocean to ocean could not be expected even by the most sanguine to give constant and profitable employment to a force of four hundred locomotives, without which the road would scarcely pay.

It appears conclusive therefore that the immediate construction of a railway from Canada to the Pacific is in a financial sense impracticable, seeing that it would not at present pay; and however important it may be considered as a great national work its successful operation as a commercial undertaking cannot take place until the country is better prepared for it.

It must not however be implied that the idea of establishing a continuous line of railway from ocean to ocean should even at the present time be set aside. It may be laid down as a maxim that wherever traffic *can exist* sufficiently extensive in any section of country to render the application of steam power profitable through that section a railway will sooner or later be constructed. The country between Canada and the Pacific is, according to reliable authority, in every respect capable of supporting a large industrial population* half as large perhaps even at a moderate computation as the population of the whole United States—the population of the whole United States sustains over 30,000 miles of railway, and therefore we may reasonably conclude that long before the interior

* Assuming that only that portion of British America west of the Lake of the Woods and south of the main or North Saskatchewan River, is capable of being populated to no greater density than Russia, the least populous country in Europe, Norway and Sweden excepted, within these limits a population of 15,000,000 would be contained, (the density of the population of Russia is only about one-third that of the settled portion of the Canadas). The occupation of this portion of the country need not be considered a great encroachment on the territory from which the Hudson's Bay Fur Company derives its revenue, it would still leave 2,000,000 square miles, an area four times greater than that assumed to be populated, an area quite as extensive as Russia, and abundantly sufficient, it is presumed, for a hunting ground.

of British America is fully occupied, a leading line of railway communication through it may be successfully operated and profitably sustained.

The question of opening up new territories for settlement by means of some comprehensive and economical road system engaged my attention a few years ago when I had the honor to read two papers on the subject before the Canadian Institute, and I cannot but think that some of the conclusions then come to apply with peculiar force to the subject matter of this letter. In one of these papers a retrospective view was taken of the process by which the Province of Canada had become habitable and inhabited, so far at least as lines of internal communication had been instrumental in producing these results, and an analytical examination of the existing road and railway systems was made, as well as an enquiry into the means employed to produce them. From these enquiries, instituted with the view of arranging some more perfect system of road development for advantageous introduction into unoccupied districts, certain deductions were drawn, of which the following may at present be submitted.

In carrying railroads, the most perfect of all roads, into remote unsettled districts, two great difficulties have to be encountered at the outset:—First, their construction; secondly, their maintenance.

The former may be overcome by a process which strongly resembles a law or principle in mechanical science, by which we are taught that time is an element of equal importance to power in the performance of mechanical operations. The construction of a railway with all its parts is nothing more than a complex mechanical operation, whilst capital or money may be designated the force or power employed to bring about the desired result; a large expenditure of financial force is undoubtedly required to accomplish the object within a short period, but owing to the peculiar relation between

power and time the employment of a small amount of force or capital would equally accomplish the same end in a longer period ; both of these elements are indispensable, but they are not necessarily required in fixed proportions, if we use the maximum of the one we only need the minimum of the other,—if circumstances in any particular case will not justify a large expenditure of capital then time may be extensively employed to accomplish the work in hand.

The second difficulty above referred to, viz. : that of maintaining a railway in a new district after its completion, although by far the most serious of the two, is one which fortunately can be removed by a particular solution of the first. It is obvious that to put a railway in a condition of being self-sustaining, the traffic of the country through which it passes must first be developed, for however important and promising the "through traffic" of any projected line may appear, experience has shown on nearly all railways that the "local" or "way traffic" is that upon which they must mainly depend for a revenue. The local traffic of a new territory can only be developed by the introduction of labour and inhabitants ; this is a work of considerable time even under the most favorable circumstances, but until this be done it is useless to expect sufficient traffic, and without sufficient traffic the railway cannot maintain itself.

In applying the foregoing to the question of forming a railway connection between Canada and the Pacific, it would follow that whilst the completion of the work at the earliest period possible would absorb an enormous amount of capital, and leave the line for many years without the means of earning sufficient to sustain itself, the gradual process of construction would draw upon capital only to a limited extent, and it would leave the railway finished when the traffic was sufficient to keep it in profitable operation.

The former course may fairly be rejected as incompatible with the

first principles of economy, the latter being perhaps the only alternative, forces us to the conclusion that the gigantic work under consideration, to be constructed at all must be viewed as a work of time; and it remains for us to consider how the time at command can be most profitably employed to bring about the desired result.

THE ROAD SYSTEM OF CANADA,

CONSIDERED IN VIEW OF A COMPREHENSIVE PLAN FOR NEW TERRITORIES.

In pursuance of the object in view, it may be satisfactory and profitable to refer briefly to the leading characteristics which have marked the origin and improvement of the roads as well as the introduction of railroads in the settled portion of Canada.

The settled or partially settled portion of Canada embraces an area estimated at 35,000 square miles; its road system or means of intercommunication exclusive of navigable channels, consists of nearly 2,100 miles of railway in full operation, of probably 3000 miles in the aggregate of improved roads, comprising those made of broken stone, gravel and plank, and in round numbers of 50,000 miles of what are termed road allowances; of the last it is estimated that considerably less than one-half the total length is cleared of the timber and so far improved as to be passable for waggons, the remainder being as yet uncleared and in part permanently impassable.

The road allowances demand some explanation; they are invariably one chain (66 feet) in width, and are left between the square or rectangular blocks of farm Lots, into which the whole country has been subdivided for settlement; they are consequently in parallel lines, and in two sets, the one crossing the other at right angles, leaving blocks between of two or more farm lots of 200 acres each.

The aggregate area of these road allowances is extremely liberal, as it cannot be much less than 400,000 acres, but from the manner in which the allowances are laid out they cannot in all cases be em-

ployed for the purposes intended; they are, however, much used by the farmers in common for pasturing cattle. Where the country is level and free from lakes, rivers or other obstructions, the road allowances have been converted into good summer waggon roads by the annual performance of statute labour and they give ready access to the farm lots; where the country is hilly or broken on the other hand, great difficulty has been experienced in making them passable, and in many instances this is impossible, and in others after a great deal of money and labour had been expended, the original road allowances have been abandoned for better locations.

As the settlement and trade of the country advanced a demand was made for a more improved class of highways on the leading lines of traffic; this led to the construction of plank,* gravel or broken stone roads through different parts of the country, and may be said to constitute the second stage in the development of the road system.

As the road allowances were left in the original surveys more to mark the limits between blocks of land than to accommodate the future commercial wants of the country, they did not long remain the only means of communication between one business point and another. Increasing traffic frequently called for roads with easier grades than those to be had on the original road allowances, and in cases where it sought an outlet diagonally across the country, it demanded a shorter line than the old rectangular zig-zag one; in this manner new and more perfect roads were constructed in various sections of the country.

The third and last stage in the establishment of lines of internal communication within the Province, was the formation of railways; these were first introduced about ten or twelve years ago when the increasing commercial wants of the country appeared to demand a greater degree of rapidity, safety and security of transport.

* The first plank road was built in Upper Canada in 1836.

Although the location of railways through any district requires a higher degree of care and skill than that of gravel or other roads of a like character, yet it is governed by precisely the same principles, and the general direction of all lines is prescribed by the leading direction sought by traffic; hence we find that the various lines of railway have been constructed parallel, or at least in a parallel direction to the various stone or plank roads which have preceded them, although they are frequently found at some distance asunder: this is a peculiarity which cannot fail to have been observed by all those acquainted with the country.

From the above brief outline of the origin and history of the lines of commercial intercourse within the Province, it will be seen that three distinct classes of roads have at different times been constructed to meet the requirements of traffic. First we have common earth roads on the original road allowances. Second, gravel, plank or broken stone roads in improved locations. Third, railways constructed quite independently of the other two—showing as a rule that three distinct works have been made, involving as many separate expenditures before the final object is attained. The only exception to this rule are where the second class have been made on the lines of the original road allowances, but these exceptions have perhaps been even more expensive to the country than when the rule has not been departed from.*

*In a Report made by Thomas Roy, Esq., Civil Engineer, in 1841, to the Governor General of Canada, reference is made to the excessive cost of making good roads on the line of original allowances drawn straight through the country across ravines, over hills, through swamps and other hindrances. Amongst other cases where attempts have been made to construct improved roads on such lines as that alluded to he instances the following: "The grants were made to macadamize Yonge Street Road from Toronto to Holland Landing, near Lake Simcoe. Now Yonge Street Road was so located that it was extremely difficult and expensive to form it into a tolerably good road. On that portion which has been already done nearly as much money has been expended in cutting hills, building bridges, &c. &c., as in road-making, yet

It may also be observed that the system adopted has in minor details unavoidably resulted in many permanent inconveniences to the trade of the country, which under other arrangements might have been obviated; as an illustration it may for the present be sufficient to allude to the inconvenient distances which nearly all the railway stations are from the towns and villages they are intended to accommodate. It may further be noticed that a degree of competition likewise obtains between the parallel lines of communication throughout the country, alike injurious to the interests of both. A stone road running parallel to a railway cannot fail to share with it the traffic of the locality, perhaps just sufficient to prevent the later line from paying, while the former is deprived, by the more recent work, of the revenue it had a right to anticipate when originally constructed. True it may be said that the country benefits by the rivalry between parallel lines; this, however, is very questionable, as both roads cannot permanently continue to be maintained at a loss, they must either fall out of repair or the tolls must be raised to enable them to pay dividends. Could these stone or other improved roads, instead of being parallel to the railways, be extended as branches to them from the stations, it is apparent that then the

several of the inclinations are as steep as 1 in 14. That portion which remains to be done is still more difficult, and it will be more expensive. Now, if previously to commencing the work an experienced Engineer had been instructed to examine the country and to lay out a road upon the best ground which he could find between Toronto and Holland Landing, he would have discovered that between 2 and 5 miles west of Yonge Street Road, a line of road could have been got from Toronto to the base of the Ridges, (about 25 miles,) without crossing one ravine, or meeting any difficulty except the hill to the north-west of Toronto; and farther, that the Ridges could have been crossed in that direction without involving any considerable difficulty. The result is, that the same amount which has been expended in making about fourteen miles of a very indifferent road, would have made about thirty miles of excellent road, leaving no inclinations steeper than 1 in 40; a circumstance that would have produced a great saving in repairs, and in expense of animal strength."

country generally would derive greater advantages, while the different classes of communications, in performing their proper functions, would receive corresponding benefits to those they conferred.

It is not for a moment presumed that a re-arrangement of existing lines of traffic such as that suggested is now possible; but these remarks are offered with the view of showing some of the benefits which would result from a pre-arrangement of internal communication in a new country, such as I will take occasion to refer to shortly.

Before attempting to show how we may best profit by the experience obtained from the Canadian road system in any effort to colonize the interior of British North America, I will first allude to another point which doubtless has suggested itself to many others, and which I think is of some moment.

If we proceed to analyse that portion of a perfect railway upon which the trains are rapidly transported we find that it consists essentially of the following parts: 1st, Two smooth parallel and horizontal surfaces upon which the wheels of the carriages roll; these are formed by iron rails resting upon cross-ties and supported by chairs or other fixtures, the whole being termed "the permanent way" or "superstructure." 2nd, A layer of gravel or broken stone from fifteen to thirty inches in thickness immediately under and around the cross-ties, and technically called "the ballast." 3rd, An earthen surface uniformly even and properly ditched at the sides. This surface is termed "the formation level," and on it the ballast is placed, and thus proceeding downwards from the completed rail track we have:

- 1st. The Permanent way.
- 2nd. The Ballast.
- 3rd. The Formation Level.

To those who have observed the successive stages of railway building it will be clear that "The Formation Level" is not dissimilar, except in possessing easier grades and curves, to the best description

of "common earth roads," and might readily be used for all the purposes for which the latter are employed. Again, when "the Formation Level" becomes coated with "Ballast" we have what is designated "The Road-bed," and which, without any portion of the "Superstructure," corresponds with the general construction of "Gravel" or "Stone roads." If, therefore, we invert the order above given, and likewise substitute new names, we have,

- 1st. *An Earth Road*, corresponding with the Formation line.
- 2nd. *A Gravel or Stone Road*, corresponding with the Road-bed.
- 3rd. *A Railway*.

This is precisely the order in which the leading lines of communication have been formed in Canada, and although each work as a rule has been constructed independent of the other, and thus necessitated separate expenditures to accomplish one end, yet it does not appear a difficult matter to point out how the same object can be better attained in new territories to be settled, by a simpler and less costly system. Were the railway line first located, the common classes of roads which naturally precede it might first be made (on the railway location) and used until each in its turn merged into its successor; and by such a plan it is clear that considerable saving would result on the final establishment of the railway; There might be new earth works needed where the ground was broken by ravines and hills, as well as stronger bridges across rivers, but no outlay would be necessary for land, or for clearing and grubbing, at any place, and on level sections of the line, such as occur on all roads, the only additional expense would be that for the superstructure.

A ROAD SYSTEM FOR NEW TERRITORIES.

TOTALITY AIMED AT, AND PROVISION FOR FUTURE RAILWAYS ADVOCATED.

From the foregoing observations it must be obvious that the progress of new territories, as well as their future and permanent social

and commercial wants would be much influenced by a pre-arrangement of the various lines of internal communication ; and it must be equally clear that to attain the highest degree of easy intercourse between every section at the least outlay of capital and labour every road of whatever class, should be considered as a portion of a whole system.

The system of construction proposed to be advocated is that of a gradually progressive character, similar to that already hinted at, and inasmuch as it would evidently be a misnomer to designate the various lines of roads in their rudimentary stages by the names they may ultimately be intended to bear, it is thought that the following terms for the three classes of lines will be convenient and sufficiently appropriate.

1st. *Territorial Roads*.—These trunk lines, intended to serve large districts, and which may in course of time be converted, stage by stage, into railways as the settlement of the country advances and its traffic becomes developed. “Territorial Roads” to be invariably located with easy curves and on the most available ground for railway service.

2nd. *Colonization Roads*.—Those lines of secondary importance, to be opened in the first place for the better introduction of settlers, and which may without change in their direction be converted in course of time into good gravel or macadamized roads.

3rd. *Concession Roads*.—Those lines of least importance, designed simply to give access to farm lots from the leading lines last mentioned. Concession roads might be laid out generally across the colonization roads, and between the several blocks into which townships are usually sub-divided.

In pre-arranging a system of internal communications for a new territory, it would be necessary to take a prospective view of the character of the traffic which might exist when after a lapse of years

the district becomes populated; in this we might be guided by drawing a comparison between the natural advantages of soil, climate and position of the section of country to be colonized with those of any similar section which has become occupied and to some extent developed. In this manner we could form some idea of the nature of the future commerce of the country, and consequently of all the classes of roads which would ultimately be required to accommodate it. The leading direction which traffic may seek, or the direction which in a national or political sense it may appear expedient to guide it, would prescribe the general direction of the main line of road through the territory, and the other consideration would determine its character. This is the first thing to be established, as upon it the direction and character of all minor lines mainly depend.

Assuming that the tract of country to be colonized is such as to justify us in the belief that in due time a railway may be constructed through it, the first step would be to lay out a "Territorial Road" between the more important points in the general direction of traffic previously determined. The territorial road ought to be located with the utmost care and in all that relates to curvatures and levels the best railway location in an *engineering aspect alone* which the country traversed could afford. In this respect there would doubtless be less than usual difficulty, as there would be neither right of way obstacles to guard against nor local interests to serve, and consequently no undue influences to twist or warp the intended line out of the most advantageous location. The main artery of traffic for the future service of the country might thus be determined upon under most favourable circumstances.

It would next be necessary to select at proper intervals the most suitable points for stations and villages, and from these as diverging points "Colonization Roads" might then be laid out to the right and left with as much care as the location of gravel or macadamized

roads generally require. These colonization roads thus laid out and adapted to the peculiar features of the locality, avoiding steep hills, ravines, lakes or unnecessary river crossings, might form centre or governing lines upon which the townships may be projected; these townships to be sub-divided in the usual way into blocks of farm lots with concession roads between, drawn so as to unite with the colonization roads.

The above is a simple skeleton outline of a road system which it is thought might with advantage be introduced into unoccupied fields, and although it may be unwise to complicate it with too many details still there is one additional point which seems too important to be passed over. I have already alluded to the difficulty experienced in operating railways where the road is liable to be blocked up with snow drifts;* and I may now refer to the extreme necessity of making some provision for a permanent and convenient supply of timber for fuel and general repairs.† As a preventive against the

* It has been pretty well established that the most efficient preventive of snow drifts is to preserve the woods along each side of the rail-track beyond the line of fences. Trains are seldom detained by snow evenly fallen through wooded parts of the country, as it scarcely ever falls so deep between trains as to offer any inconvenience. The detention to trains from snow always occurs in the open country where the woods have been cleared away and no obstruction is presented to the formation of snow drifts on certain exposed positions.

† In districts where no coal exists and in consequence wood is employed as fuel, and more especially in those sections of the country where the absence of navigable water channels renders the more expensive system of land transport necessary, it would seem good policy to husband the growing timber for future wants. Already in some parts of the United States the difficulty and expense of procuring fuel for Railways and for other purposes is beginning to be felt; in Canada the Railways alone consume not far short of 300,000 cords every year, thus involving the annual destruction of more timber than is generally obtained from an area of six thousand acres, and in all countries in a northern latitude, beyond the convenient reach of coal-fields the conservation of sufficient areas of timbered lands must become of increasing political importance. To ascertain the extent of woodland sufficient to

former, and as an ample provision for the latter, I would suggest that a belt of wood land along the territorial line of sufficient breadth should be reserved for shelter and the purposes above mentioned. The belt of wood-land to be at all effective against the worst effects of snow should be of a considerable width, sufficient in fact to shelter the line of road and arrest the snow drifts beyond the limits of the line of traffic. In open sections of the country it might, in view of the same end, be advisable to encourage the growth of timber on reserves to be left for the purpose along the line of road. The uniformly even falls of snow would of course always occur, but on railways these are easily overcome by light snow ploughs attached to the front of the engines, and they seldom interfere with the regular running of trains.

These continuous timber reserves along the sides of the territorial road, whilst they would greatly lessen the difficulty of operating a

yield a permanent supply for a given rate of consumption, the writer a few years ago initiated the following steps: A piece of average timbered hardwood land was selected, a rectangular portion was staked off, within the limited area each tree was separately examined, the length and circumference of the trunk and main branches as well as the thickness of the rings of annual growth of each were ascertained, and upon this data was calculated the quantity of solid wood annually produced by the process of vegetation. The result gave about 60 cubic feet of solid timber to the acre, and allowing for the interstices between each stick as usually piled, this may be considered equal to about three quarters of a cord; consequently to yield a perpetual supply there ought to be one and a third acres of timber land reserved for each cord of wood required annually.

Taking the above as correct and assuming that a Railway with ordinary traffic consumes annually 150 cords of wood for every mile of road operated, it follows that 200 acres should be reserved for the growth of fuel for every mile of Railway. In like manner it can be shown that cross-trees or sleepers would require about 40 acres for every mile, and fencing as much as 24 acres for each mile of Railway. It appears obvious, therefore, when we consider the many other purposes to which timber is applied in the maintenance of a Railway and its Rolling stock, that there ought to be about 300 acres per mile reserved for the growth of timber for all purposes. A belt extending a quarter of a mile beyond each side of the line of road would fully embrace the required area.

railway along the same line in winter,* as well as provide a permanent supply of wood for fuel and general repairs, they would moreover result in several incidental advantages favorable to the construction and maintenance of the future railway as well as to the safety of the public.

As all the roads in every section of the country along the line of the intended railway would connect through the "Colonization Roads" directly with the stations, the traffic would naturally centre at these points, and at these points *only* would railway crossings by public roads be required. Again, there would be no private or "farm-crossings" needed, as the farm lots being laid out subsequent to the location of the road, would of course be wholly either on one side of it or the other, besides being separated from the road by the timber reserve. The advantages resulting from these arrangements would be threefold, viz. : in original construction, subsequent maintenance, and public safety. In original construction it is clear that no bridges, level crossings, cattle guards or gates would be required at any part of the line, other than at stations, to accommodate public roads, and at no place whatever would farm crossings be needed. In maintenance, corresponding advantages would result, as the repairs of these works, generally of a perishable nature, would be for ever saved, and the constantly recurring damage from cattle straying on the track would be very greatly lessened. Public safety would undoubtedly be greatly promoted by any plan which would diminish the number of road crossings. In any country subdivided for settlement in a manner similar to Canada before the railway-lines are laid down we cannot avoid having the road crossings almost one in each mile,

* The obstacle presented by snow drifts is *the great difficulty* in the way of operating railways in winter in high latitudes. The cost of clearing away the drifted snow on some portions of the Canadian Lines, in the winter of 1860-1861, was very great. The drifts invariably occurred where the adjacent country was cleared of its timber.

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so that on every 100 miles of railway we have probably in the aggregate over 5,000 lineal feet of track not only destitute of protection but exposed day and night to waggons, foot passengers, and cattle passing to and fro. Besides which the great number of cattle guards required is an important element of danger. These being made of timber beams are equivalent to small wooden bridges, and their great number swells out the total length to something very considerable. On all the railways in Canada the cattle guards it is estimated cannot measure less than 20,000 lineal feet of track, and are probably not much less dangerous than the same length of wooden bridges. In addition to the public road crossings above alluded to, there are a very great number of ordinary "farm crossings," which in point of safety to the public travelling by rail as well as to the property of the railway companies, are perhaps equally to be feared, for although they are protected by gates these are constantly liable to be left open, either through the design or negligence of farm servants.*

In the road system recommended for new districts, the railway whenever it came to be operated would be entirely freed from farm crossings, and the public road crossings would only occur at stations

* "One of the most fruitful sources of accident are the great number of crossings of street, highway, and farm roads at the level of grade. The total number of these is over eight thousand, and there is an average of three to each mile of road in operation, and more than one public road or street-crossing to each mile. It is believed that nearly ten per cent. of all the accidents by which persons were killed or injured, is due to this cause.

"The expense of maintaining watchmen at many of these crossings, and the damage to the property of the companies by collisions caused by them, render them costly.

"The policy of reducing the number of those at grade, is generally conceded; and it is recommended that authority be given to change road-crossings which are at the level of grade, whenever it can be done without much detriment to the travel, so as to have two or more roads use one crossing; and, in all cases, where it can be done at a reasonable expense, to require them to be carried over or under the railroads."—*Report of the Board of Railroad Commissioners to the Legislature of the State of New York, 1856.*

where the danger of accidents is always least, from the fact, that the speed of trains is invariably reduced at these points.

Before proceeding to consider how the road system suggested would apply to the wide areas of unoccupied lands in the interior of British America in view of colonizing them, as well as of ultimately establishing a leading line of railway from the settlements of Canada to the Pacific, I may observe that two principal objections present themselves to the system advocated.

The expense of making the surveys and laying out the land for settlement would undoubtedly be much greater than that required to lay out wild land in the usual manner; but then while the old plan is simply to divide the country into rectangular lots without any sufficient provision for future traffic or present access; the new plan has a double object in view, it has, in addition to the purposes contemplated by the old system, that of making every part of the country accessible in the readiest way at the minimum expenditure, and with the greatest permanent advantages attainable. Another objection arises from the proposal to keep the territorial road lines wooded on both sides except where stations may occur, thus rendering the road less agreeable to travel on than if the cultivated country was allowed to be immediately adjacent. This is undoubtedly an objection, but I think that it cannot weigh much when the benefits to be expected ultimately from the preservation of the wood is fully considered.

A HIGHWAY TO THE PACIFIC.

A PLAN OF GRADUAL DEVELOPMENT RECOMMENDED.

In the foregoing observations it has been my endeavour to show, as briefly as possible, the following points:—

1st. That the project of a highway to the Pacific is as old as the first settlement of Canada, and that recent events show its increasing importance.

2nd. That a continuous line of Railway with Electric Telegraph is better calculated to meet the permanent wants of the Country and serve the interests of the Colonial Empire than any other means of communication between the two Oceans.

3rd. That although the magnitude of a scheme for a Railway across the Continent is very great, yet the vast importance of the work, in a commercial, military, and national view, would demand its construction were the resources of the country and the traffic sufficiently developed.

4th. That the immediate completion of this work cannot be seriously entertained in the present condition of the country, the cost of maintenance without sufficient traffic being so very great, and that therefore, to be constructed at all, the Railway must be a work of time.

5th. That the Canadian Road and Railway system has illustrated the advantages which may be derived from the adoption of a comprehensive Road scheme in laying open new districts for settlement.

6th. That a scheme which embraces the ultimate completion of Railways and less perfect lines of communication by a progressive system of construction possesses many features favourable to the first settlement as well as the future requirements of the traffic of new Territories.

7th. That the system proposed for the development of the highways of a new country by progressive stages corresponding with the progress made by the country itself in general advancement, is one peculiarly applicable to the case under discussion; and while it might be expedient, in the first instance to employ some of the natural water channels as a means of introducing settlers and labourers along the line of road, until the latter became in some degree serviceable, it would not be advisable to incur any great expenditure on works beyond the limits of the great thoroughfare ultimately in view. That the first effort should be made to construct an Electric

Telegraph along the precise line of the future Railway, that the Telegraph should be the precursor of other means of communication, beginning it may be, with a Bridle Path or Indian Trail from post to post, and ending with a perfect line of Railway, when the traffic of the country, or the interests of the Nation required the most rapid means of steam communication.

With these remarks I will now attempt to show how the work, in its different stages, may be proceeded with.

The first step required is the location of what has been designated a "Territorial Road" between all the more important or governing points on the line of route. Commencing at the Western Terminus, these points would probably be, the mouth of the Fraser River, or the best harbour on the Pacific coast north of the 49th parallel—the best pass which has been or may be discovered across the Rocky Mountains contiguous to a line which would run along the general direction of "the Fertile Belt"* of the interior—the most southerly

* "There is a broad strip of fertile country, rich in water, wood, and pasturage, drained by the North Saskatchewan and some of its affluents; and being a continuation of the fertile prairies of Red River, the eastern watershed of the Assiniboine and Red Deer River, with the outlying patches called Touchwood Hills, File Hill, &c.

"It is a physical reality of the highest importance to the interests of British North America, that this continuous belt can be settled and cultivated from a few miles west of the Lake of the Woods, to the passes of the Rocky Mountains, and any line of communication, whether by waggon-road or railroad, passing through it will eventually enjoy the great advantage of being fed by an agricultural population from one extremity to the other.

"No other part of the American Continent possesses an approach even to this singularly favourable disposition of soil and climate; which last feature, notwithstanding its rigour during the winter season, confers, on account of its humidity, inestimable value on British America, south of the 54th parallel.

"The natural resources lying within the limits of the Fertile Belt, or on its eastern borders, are themselves of great value as local elements of future wealth and prosperity; but in view of a communication across the continent, they acquire paramount importance."—*Narrative of the Canadian Exploring Expeditions: H. Y. Hind.*

bend of the North Saskatchewan River— the best crossing of Red River between its confluence with the Assiniboine and the southerly end of Lake Winnipeg—the best crossing of the River Winnipeg near the north end of the Lake of the Woods,—the most northerly bend of the shore of Lake Superior—the best crossing of the French River between its junction with Lake Huron and Lake Nipissing,—and lastly, the most desirable point of connection with the existing Railway system of Canada either at Ottawa, at Peterborough, or at Barrie, all of which points are directly connected with the Grand Trunk Railway by means of the branch lines running southerly to it. On the location of the “Territorial Road,” which could only be done on a careful survey of the country, the next step would be the determination of Station points from whence to lay out Colonization Roads to the right and left, wherever the soil was favourable for settlement. Upon the Colonization Roads the Townships would next be projected.

So soon as any section of the road was finally located, together with its branches, the introduction of settlers might commence. The road should be cleared through the wooded districts to a width of two chains or 150 feet, in order chiefly to preserve the Telegraph, when erected, from being injured by trees falling. The clearing would at once give employment to settlers, and with subsequent work in improving the road, greatly aid them in paying for their land and in supporting their families until their farms produced sufficient crops. Throughout the open prairie country, which is more than one third the whole distance, the trouble and expense of clearing would be avoided ; but as the great natural obstacles which isolate the interior and prevent the possibility of establishing a continuous Telegraphic communication through the country are the wooded and broken districts at both extremities, it becomes indispensable to force a way of communication through them : this is doubtless a work of considerable

labour and corresponding expenditure, but without it no satisfactory progress can be made. This preliminary step is especially requisite to the east of the Red River valley, so that settlers might obtain access to the central plains, and in view of the construction of a continuous line of Telegraph at an early day, to be followed by a waggon road as soon as circumstances would allow, the Territorial line should be cleared through the western division likewise.

The "Territorial Road" from the settlements of Canada to the valley of the Red River would pass through a country only partially explored and consequently but little known; it must be said, however, that what is known of it is not very favourable. More careful surveys, of a portion of the country, recently made by the Canadian Government have shown that a large section formerly considered worthless is really fitted for settlement and is now being rapidly occupied; and it is hoped from this circumstance that at least a portion of the land along those sections of the line yet unexplored is capable of being cultivated.

To begin at one end of the Road and gradually extend the settlements northward and westward would perhaps be too tedious an operation in view of the importance of opening an early connection with the interior. It would, therefore, doubtless be advisable to begin at several intermediate points accessible by water from Lakes Huron and Superior, and proceed with simultaneous operations. On referring to the map it appears that such points exist at distances ranging from 50 to 90 miles apart, and from these as bases the clearing of the road could proceed in both directions at the same time, while settlements could be formed wherever the soil proved favourable. In due time the clearings, penetrating the forest to the right and left along the line of Road previously located, would pierce the country from one end to the other, and the same being accomplished in a similar manner in the western division, a continuous line of Electric Telegraph might then be constructed.

The extreme importance of the Telegraphic communication extending from colony to colony across the country, even during the earliest stages of settlement, is too apparent to need comment, and being constructed on the precise line of the intended waggon road and of the ultimate Railway, it would always be in the position where its services would be called into requisition.

While the Territorial line through the eastern division gradually became developed into a good waggon road by the labours of the settlers and such grants of money as its importance appeared to warrant, it is probable that the Canoe Routes from Lake Superior to Red River might by partial improvement be made serviceable for ingress and egress during summer to the interior; and with the object of promoting emigration to the Central plains as well as to other points along the line of Road, it would probably be expedient to improve these routes by a limited outlay, but for the reasons already given I cannot help thinking that it would be the wisest policy to concentrate the chief expenditure on that line which must be sooner or later the leading highway through the country.

The expenditure of labour year by year on the Territorial line, as the country at the same time progressed in settlement, would gradually produce a regular stage road capable of being travelled with considerable rapidity; and which would serve all the purposes of transport from one point to another, until the increasing traffic was considered sufficient to maintain a line of steam communication. When that period arrived, comparatively little additional expenditure would be required to complete the line of railway, had proper care been exercised in locating the Territorial road in the first instance, and in constructing the work in its subsequent progressive stages. It is believed that probably not less than four-fifths of the whole length of the line might be ready for conversion into a railway, simply by laying the superstructure of cross-ties and rails on the surface of

the macadamized or gravelled road-bed ; at other points permanent bridging and reduction of grades would be called for.

I would rather refrain from expressing an opinion as to the amount and mode of expenditure on a work conducted as above suggested, as so little is known of several important sections of the line of route, and so much depends on other considerations of detail. I may, however, by way of illustrating one of a variety of methods by which the general design of the scheme might be carried out, submit the following, premising, that while it is intended that the chief part, if not the whole of the cost, up to a certain stage, should ultimately come out of land sales, it would be necessary for either the Imperial or Colonial Governments to appropriate, in advance, sufficient to defray preliminary expenses ; and perhaps it would be advisable that all expenses should be borne in this way up to the completion of a continuous line of Telegraph, to connect the chain of little colonies which would spring up along the line of route. All these expenses might be made a charge against the general Territorial Revenue of the country benefited, a revenue which would only begin to augment when the lands became easily accessible and were made productive by labour.

It has already been shown that the success of a railway to the Pacific would mainly depend on the possibility of introducing a sufficient number of inhabitants in the country to be traversed ; if the population of the country is to govern the period when a railway should be set in operation, we may likewise take it as the basis of annual expenditure on the preliminary stages of the work. Suppose the average annual increase could be reckoned at 100,000 souls,*

* In the whole United States, which country resembles the one under discussion more closely than any other, there are about 1000 inhabitants to every mile of Railway in operation. It would scarcely be safe to estimate that a line through British America could be profitably sustained with a less

and that it be determined to expend annually on the works a sum equal to one dollar per head of the whole population in each respective year, the following results in the developement of the undertaking might be obtained :—

1st. In from three to four years, besides the expense of surveys, a territorial road line might be located throughout, the wooded districts which extend over a length of over 1400 miles, might be cleared to a width of two chains, and a continuous line of telegraph constructed from Canada to Fraser's River.

2nd. Within a further period of two years a road passable for wheeled vehicles might be formed along the whole line of route.*

3rd. Macadamized roads of the very best description might be completed, in addition to the foregoing, in the following order :—

(1) From Lake Superior to Red River, a distance of 400 miles, in nine years from the present time.

(2) From the mouth of Fraser's River to the Rocky Mountains, a distance of 400 miles, in eleven years from the present time.

(3) From the settlements of Canada to Lake Superior, a distance of 650 miles, within fourteen years from the present time.

(4) From Red River to the Rocky Mountains, a distance of 800 miles, within seventeen years from the present time.

And thus by the comparatively trifling annual outlay of one dollar per head of the assumed gradually increasing population, we

proportion of inhabitants per mile of its length. The whole length will probably be found to be between 2000 and 2500 miles, and hence the population ought to be from two to two and a half millions. It would thus require 20 to 25 years, even with an annual increase of 100,000 to give the requisite number.

* This would be a common earthen road on the natural surface of the ground, unless where grading and ditching is required; it would be similar to the colonization roads so economically opened by the Canadian Government through the wild country between Lake Huron and the Ottawa, as well as in other districts. Within the last four or five years a total length of nearly 500 miles has been opened, at a cost of about \$250,000.

could secure in less than four years a line of telegraph, and in thirteen years more a substantially constructed macadamized road throughout the whole length of the line. The next and final stage of progress would be, the completion of the Railway on the line thus, in a great measure, prepared for it; and in view of the traffic then created, as well as the comparative economy in construction, it might be undertaken in sections by private enterprise, or in such other way as might then appear most expedient.

I am not prepared to say that the foregoing is the best order of sequence in which the several sections and stages of the work should be constructed, it is simply presented for the purpose of showing what might be accomplished by a small annual expenditure. It is not at all unlikely that the peculiar nature of the traffic might warrant the conversion of some section of route into a railway at an early period,—possibly that section between Lake Superior and Red River would be the first to require the change, which of course could be made without difficulty at any time, so soon as it appeared that the trade of the country was sufficient to maintain it. The order of sequence is not important, but it is an essential part of the system proposed for opening up this vast and roadless country, that very portion of work done should form a component part of a perfect whole, and that whatever expenditure is made, whether it be one thousand or one hundred thousand dollars, should be laid out in the right place in accordance with a thoroughly digested and well matured plan, the great object in view being to obtain the maximum result of good from the minimum amount of outlay.

I can scarcely hope to expect that the plan of gradual development herein advocated will satisfy the precipitate or the impatient,—those, in fact, who would urge the immediate construction of the road, regardless or ignorant of the cost and the burdens it might in consequence entail on the country—yet there are many who, remembering the tortoise in the fable, will perceive that a slow yet certain

movement will accomplish the desired end with as much certainty and perhaps more satisfactorily than if the work was undertaken with the most sanguine hopes of speedy achievement. It is very doubtful, however, if any one will, on reflection, assert that there is really a choice of methods, that is to say, a fast and a slow one—the line of artificial highway proposed to be constructed extends over not less than forty-five degrees of longitude, equal to one eighth the length of a circle of latitude passing entirely around the globe; the undertaking, therefore, becomes one of no ordinary magnitude, and when in connection with it, half a continent has to be redeemed in part at least, from a state of wild nature, some considerable length of time must necessarily be occupied in the process. Even if it should take quarter of a century, it would be equal to an average construction of 100 miles of Railway a year, as well as the annual introduction of 100,000 emigrants. And, after all, a quarter of a century is but a very brief period in the history of a country—half that length of time has already elapsed since the Railways of Canada were first commenced, and yet many are of opinion that it would have been better, in some respects, had only one-half the extent of existing lines been yet constructed.

As the character of the work is so colossal and the condition of the country such as to debar the idea of undertaking the construction of a Railway through it in the usual way and as an ordinary commercial enterprise, I am emboldened to think that such a scheme as I have endeavoured to sketch, might form the basis of a system possessing many recommendations, and which it is confidently believed might be advantageously adopted in any attempt to establish a great leading highway through the vast unoccupied Territory between the settlements of Canada and British Columbia.

I am, dear Sir, very truly yours,

SANDFORD FLEMING.

TORONTO, April 14, 1862.

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THE foregoing will serve to explain the views of the writer on this interesting subject, as well as the reasons which guided him to conclusions; and it only now remains for him respectfully to offer some further observations on the proposed railway connection between Halifax and Quebec, together with some suggestions on the application of the offer of the Imperial Government to the attainment of the completion of that work, as well as the construction of an unbroken line of communication across the continent, by a comprehensive system of road development similar to that above advocated.

The proposal of the Imperial Government is to afford to the provinces a guarantee of interest towards enabling them to raise the requisite funds at a moderate rate.

THE INTER-COLONIAL RAILWAY.

In order to secure a railway connection between Quebec and Halifax, it has been proposed that the Governments of Canada, Nova Scotia and New Brunswick, with the aid of the Imperial Government, should annually pay an amount equal to the interest on £3,000,000, the estimated cost of the work. This proposal assented to would speedily secure the expenditure of that capital, but something more is really necessary. To be of any service at all, the railway must be kept open, otherwise it would be of less use than a common road—it cannot be kept open except at a loss, if the receipts prove less than the cost of operating, including all repairs and renewals. Traffic alone will produce receipts, and as a sufficient quan-

tity of "through traffic" cannot be looked for, it becomes necessary to cultivate "local traffic" as comparatively none at present exists. This is not the work of a day or a year, it undoubtedly requires time, and therefore the true way is to employ time to prepare the country for the railway; in a word, the country along the line of route must first be settled, and its trade and agricultural resources in some degree developed. It seems obvious, therefore, that the opening of what has been termed in the foregoing letter a "Territorial Road," is well calculated to accomplish the desired ends; it would at once make unoccupied lands accessible for settlement, develop the commerce of the country, and at the same time prepare for and advance the great work sought to be achieved.

Public works cannot, as an invariable rule, be constructed advantageously by a gradual or fragmentary expenditure of capital. A canal, for example, must be completed in every respect before it can be of any service whatever, and in such a case there can be nothing gained by postponing the completion of the undertaking beyond the length of time necessary for the proper execution of the work. But the development of Railways by a gradual, or if necessary an intermittent expenditure, seems to the writer peculiarly applicable in a new country, alike sufficient for its wants and suitable to its finances.

The aim of the writer is to impress upon those high in authority that the principle of constructing lines of communication through districts where traffic has yet to be created by a progressive system is worthy of some consideration; and therefore if the advantages of the plan advocated is not

already established, he would desire to submit a case by way of farther illustration. A line of Railway 1,000 miles in length is to be constructed through an unsettled or only partially settled country; it is not viewed as an investment for capital, but purely as a National undertaking, and its cost has to be paid out of the public Treasury. Two plans, Nos. 1 and 2, are presented. By plan No. 1 a capital of \$50,000,000 has to be raised by loan at say 6 per cent., and the work carried out in a rapid manner in the usual way. Plan No. 2 is the one herein recommended, and to simplify the comparison it is predetermined to expend annually a sum exactly equal to the interest on \$50,000,000, or say \$3,000,000. In either case it is evident that the amount last mentioned has annually to be raised, and let us say by direct taxation. In carrying into execution plan No. 1 the rapid outlay of so much capital would, without doubt, have a wonderful effect in stimulating industry, enterprise and speculation; there would undoubtedly for a time be an appearance of great and unusual prosperity, prices of labour and material would in consequence be inflated beyond their average value, and in a corresponding proportion the cost of the undertaking would be enhanced.

The effect of plan No. 2 would be somewhat different; the work in this case would be proceeded with systematically and gradually, year by year. It would give steady and desirable employment to those who might be induced to take up their abode permanently along the route. The tendency to raise prices above a fair average would not be nearly so great as in the case of plan No. 1, while the growing commerce of the

country could not fail to benefit by a circulation of capital, expended gradually year by year. Moreover, a suspension of the outlay on the completion of works would be less felt, as the reaction would be comparatively small, and consequently the financial condition of the country could not be disturbed to such an injurious degree. It would be rather difficult to estimate the difference between prices of work in the two cases, but without doubt it would be very material. To allow from 25 to 33 per cent. in favour of plan No. 2 could not, it is thought, be very far astray; and with this difference it is clear that the whole cost of the undertaking would be about \$36,000,000 against \$50,000,000 if executed under plan No. 1; and hence, with an expenditure of \$3,000,000 a year, the work would be completed in 12 years. It is only necessary now to draw a comparison of results after the lapse of that period. In either case the sum of \$3,000,000 would have been raised by taxation and paid away by the country, and assuming that the traffic receipts of the undertaking would then be sufficient to meet operating expenses whichever plan had been adopted, No. 2 would leave it free of debt and the country relieved from farther taxation, while under plan No. 1 the borrowed capital of \$50,000,000 would still remain unpaid. Were receipts insufficient to pay working expenses the comparison would be even more unfavourable as against No. 1 plan, inasmuch as arrears of operating losses would have accumulated since the first opening of the line, thus greatly increasing the burdens on the country,—while with the other plan the charge for operating losses would only begin when taxation for con-

struction ceased, and even this might be postponed if thought expedient by delaying the final completion of the work until it was evident that the traffic of the country was sufficiently developed, to make the line perfectly self-sustaining.

Referring again to the proposed link of connection between Halifax and Quebec, it is quite evident, from the nature of the country through which it must pass, that it cannot be undertaken as an ordinary commercial concern or viewed as a pecuniary investment. It must be looked upon as a National work, the value of which as such it would be difficult to over-estimate; and if the possession of this important link of a perfect chain across the Continent could not be had in any easier or better way than by constructing a complete line of Railway in the usual manner, by the expenditure of a heavy capital,—even then it is thought that the immediate completion of the Railway ought for many reasons to be warmly advocated; but, in the humble opinion of the writer, all the advantages to be looked for could be attained within a reasonably short period by the adoption of a policy more in harmony with the gradual development of a country from a wild and unoccupied condition, and certainly more in keeping with the state of the public finances. A Territorial Road laid down on the Railway route most approved of by the Imperial authorities, could, in a short time, be made serviceable for the purpose of opening the country for settlement, and in due time a fixed annual expenditure would accomplish the construction of a good gravel or macadamized road, fit for any kind of travel. All the culverts and bridges should be constructed in a substantial and permanent manner in view of

the purpose ultimately intended to be served by them, and the grading should be done with the same intention. In this manner the most essential portion of a Railway would be secured in an easy and gradual manner, while at the same time the work, in its preliminary stages, would afford access and ingress to the country. We would thus have that portion and almost the only portion of a Railway which is *not perishable*, substantially constructed. At any future time, when it seemed expedient, that part which is permanent only in name, "the permanent way," could be added; and in a case of extreme emergency, should unfortunately one arise, it would be quite possible, with the energy always called forth on such occasions, to lay the rails on the prepared road-bed in a very few weeks.

Every practical Railway man will readily understand the allusion above made to that portion of a Railway which is *not perishable*, as they well know how marvellously soon the cross-ties or sleepers and the iron become unfit for duty—the former through natural decay and the latter through ordinary wear and tear—necessitating an entire renewal of what is called the "permanent way" every eight or ten years. Then the locomotives and the cars of all descriptions require heavy repairs, the cost of which in a single year is probably not less than one-eighth of the whole cost of rolling stock and machinery. The stations, the fences, the cattle-guards, and road-crossings likewise are not free from deterioration; and although the outlay required to keep these latter in repair is not nearly so great as that needed for the other services mentioned, yet it always helps to swell the total

amount of annual cost of maintenance. It may farther be remarked that a low traffic, such as must be expected for many years on lines through new districts, does not diminish in a corresponding degree the wear and tear of those portions of a Railway; the rolling stock and rails will wear out even if the trains drawn over the road carry extremely light, unprofitable loads, and the cross-ties, the fences, cattle-guards and crossings will decay equally as fast whether the Railway be used or not. On the other hand, the works under the road-bed are not, to any appreciable extent, affected by time or traffic; when once properly constructed and consolidated, culverts, bridges and cuttings may be considered, if not absolutely, at least humanly speaking, imperishable.

From the foregoing reasons, and in view of all the circumstances connected with the proposed establishment of a line of Railway communication between Quebec and Halifax, it is thought by the writer that the expenditure on the undertaking at present might advantageously be confined to the cost of grading and bridging on the most suitable location, in a military and national aspect; and that even this work would best be undertaken by a gradual system of construction as herein advocated, unless, for great political reasons, a more rapid construction appeared expedient at any time during its progress. This "Territorial Road," or foundation or substructure of the Railway, or whatever it may be thought best to call it, would be far superior to any first-class common road yet constructed, and might be used for the ordinary traffic of the country, or even for military purposes, until the exigencies of the future required its conversion into the more rapid line of steam communication.

As to the cost of the work suggested, it will be sufficient for the present purpose to estimate it by the average of similar works already constructed. The whole cost of the Railway was set down by the representatives of the three Provinces, on their applying to the Imperial Government for aid, at £3,000,000; according to existing standards of comparison, the graduation, including all bridges and culverts, would cost under £1,000,000; and allowing for the saving which would result from a gradual expenditure of the money year by year, it is considered that £750,000 would be an ample provision to complete the work contemplated. Suppose ten years be given for its completion, an expenditure of £75,000 a year for that period, raised by loan, at a low rate of interest, on Imperial credit, would, when divided between the three Provinces of Canada, New Brunswick and Nova Scotia, fall lightly on each; computed at a rate of 3 per cent. per annum would give an annual charge against each Province, ranging from £750 the first year, up to £7,500 the tenth and subsequent years.

A LINE FROM THE ATLANTIC TO THE PACIFIC.

Many of the preceding general remarks are equally applicable to the question of opening a great line of Railway or other communication across the longitudinal centre of the habitable portion of British North America, from the Atlantic to the Pacific. We may not unreasonably assume that the policy which guided the Imperial authorities to offer co-operation and aid when applied to with regard to the Railway between Halifax and Quebec, would also lead them to concur

in granting similar assistance were the larger and far more Imperial undertaking brought before their notice. If it be the policy of Great Britain to unite more closely her Colonial Possessions and distant Dependencies, she will see it her duty and her interest to countenance and promote the construction of a work which appears so well calculated to effect the desired end, and at the same time serve other high Imperial purposes.

Cherishing these views, the writer will now proceed to submit the following additional suggestions on this peculiarly interesting subject.

The length of line necessary to complete the connection between Halifax and Fraser's River may approximately be estimated as follows :

| | |
|---|---------------------|
| 1. Between Halifax and Quebec* | 350 miles. |
| 2. Between the Canadian Railway System and the eastern limit of the Great Central Plains† | 1,000 “ |
| 3. Across the Central Plains to the Rocky Mountains‡ | 850 “ |
| 4. From the Rocky Mountains to the Pacific Ocean§ | 400 “ |
| Total | <u>2,600 miles.</u> |

It has already been conceded by the representatives of the three provinces, that Nova Scotia, New Brunswick and Canada, should share equally in the cost of completing the

* Despatch from Colonial Secretary, 12th April, 1862.

† ‡ § These distances measured on the map.

connection between Halifax and Quebec; and it is thought that, inasmuch as Canada has already constructed a long section of the great railway line, viz., that portion of the Grand Trunk from Riviere du Loup westward, she could not reasonably be expected, in addition to what she has already accomplished, to bear more than half the cost of opening a communication between the most available point of her existing Railway system and the beginning of the Prairie country west of the Lake of the Woods; and as the country watered by the Red River, the Assiniboine and the Saskatchewan, would be specially benefited by the opening of this intermediate section of the undertaking, the other half of its cost might fairly be borne by the District designated "The Central Plains." The expense of constructing the remaining sections of the line it is thought might reasonably form a mileage charge against the great Territorial Divisions of the country through which it is intended to pass.

Assuming the above to be an equitable and proper subdivision of the cost of the undertaking, the following will shew the length of line chargeable against each Province or Territorial Division.

| | |
|--|---|
| 1. <i>Nova Scotia</i> | 120 miles. |
| 2. <i>New Brunswick</i> | 120 " |
| 3. <i>Canada</i> : | |
| (1) Remaining portion of Quebec and Halifax line | 110 miles |
| (2) Half of intermediate section between existing Canadian Railways & Central Plains | 500 " |
| | <hr style="width: 10%; margin-left: auto; margin-right: 0;"/> 610 " |

4. *Central Plains :*

| | | |
|--|-----------|---------|
| (1) Half of intermediate section last mentioned | 500 miles | |
| (2) Length of line across the in- terior to Rocky Mountains | 850 " | |
| | <hr/> | 1,350 " |

5. *British Columbia :*

| | |
|---|-------|
| From Rocky Mountains to Fraser River | 400 " |
|---|-------|

Total.....

 2,600 miles.

Inasmuch as the country along the whole extent of the contemplated great line of communication is not entirely under the control of local governments, it would, probably, be necessary for the Imperial Government to guarantee the interest on the whole capital required, and with the concurrence of the Governments of Nova Scotia, New Brunswick and Canada to make it a charge on the territorial revenue of each Province or section, according to the above mileage proportion, or such other proportion as might be deemed more equitable.

The writer may be too sanguine in supposing, that the scheme now submitted will be deemed worthy of any notice from those high in authority, yet if it should happen to be honoured with a share of that consideration which appears to be so freely given to all matters appertaining to this important subject, it would be found deficient without some more special reference to the financial part of it. The writer, therefore, desires further to submit a few brief remarks on this branch of the subject, premising that as it is difficult to conjecture how far the Imperial and Provincial Governments

might be disposed to incur liability, he will present it in two different forms.

Assuming, first, that the Imperial and Provincial Governments are mutually disposed to become liable for a loan sufficient to construct the entire ground-work or substructure of a railway connecting the two oceans, to be completed, say, in a period of ten years, the estimated cost and the annual charge on the territorial revenue of each section, according to the above mileage and proportion, would be as follows:—

| PROVINCE OR TERRITORIAL DIVISION. | Length of Line in miles. | Expenditure. | | Interest on Loan at 3 per cent. | |
|--------------------------------------|-----------------------------|------------------|-----------|------------------------------------|---------------------------------------|
| | | In each year. | Total. | First year. | 10th and subse- quent years. |
| Nova Scotia | 120 | £24,000 | £240,000 | £720 | £7,200 |
| New Brunswick | 120 | 24,000 | 240,000 | 720 | 7,200 |
| Canada | 610 | 122,000 | 1,220,000 | 3,660 | 36,600 |
| Central Plains | 1,350 | 270,000 | 2,700,000 | 8,100 | 81,000 |
| British Columbia | 400 | 80,000 | 800,000 | 2,400 | 24,000 |
| Totals | 2,600 | 520,000 | 5,200,000 | 15,600 | 156,000 |

This expenditure, it is believed, would secure the construction of all but the perishable portions of a great line of railway throughout the length of the country, and whilst the work would, in the meantime, answer the purposes of colonization and commerce, as a superior Gravel or Macadamized road, it would be ready for conversion into a Railway whenever it appeared advisable to change it into the most perfect means of communication, either by private enterprise or otherwise, as might then appear most expedient.

Lest, however, it should be deemed unwise at the present time to incur a greater liability than that required to form a road of the simplest character, one in fact similar to those constructed by the Canadian Government in the new settlements,* together with a telegraph line on the most suitable location for a railway, the cost of each section of the work and the liability incurred by each Province or great Division of the country would be as follows, and the time for executing the work might be limited to three years. †

| PROVINCE OR TERRITORIAL DIVISION. | Length of Line in miles. | EXPENDITURE. | | Interest on Loan at 3 per cent. | | |
|--------------------------------------|-----------------------------|------------------|----------------|---------------------------------|--------------|--------------------------------------|
| | | In each year. | Total. | 1st year. | 2nd year. | 3rd and subse- quent years. |
| Nova Scotia..... | 120 | £6,000 | £18,000 | £180 | £360 | £540 |
| New Brunswick.. | 120 | 6,000 | 18,000 | 180 | 360 | 540 |
| Canada | 610 | 30,500 | 91,500 | 915 | 1,830 | 2,745 |
| Central Plains .. | 1,350 | 67,500 | 202,500 | 2,025 | 4,050 | 6,075 |
| British Columbia. | 400 | 20,000 | 60,000 | 600 | 1,200 | 1,800 |
| Totals.... | 2,600 | 130,000 | 390,000 | 3,900 | 7,800 | 11,700 |

A total expenditure of a capital of less than £400,000 raised by loan on the joint credit of the Imperial and Provincial Governments, and hence bearing a low rate of interest, probably not greatly exceeding 3 per cent. per annum, equal to an annual charge of about £12,000 on the whole territo-

* Designated Colonization Roads.

† The estimate is based on the average actual cost of a total length of about 500 miles of these Roads recently made in Canada.

rial revenue of British North America would be sufficient to open a great "Territorial Line of Road" from Halifax to Fraser's River, embracing also the cost of a Telegraph Line between the two points. It is true that the Road would not be of a very perfect description, but then it would be the beginning and forerunner of a railway, and would give access to the country for settlement.

Steam and Electricity, the great civilizers of the present century would thus obtain a foothold on the wide, dreary, and as yet, uncultivated wastes in the far interior, and although it might be said that the seeds only of the former would be sown, the latter would bear immediate fruit; time and labour would develop the former, the latter would stimulate these agencies in their work. For many reasons it is thought that an electric telegraph ought to be erected along the precise line of the intended railway at the earliest possible moment; in addition to its value in a military and commercial aspect, as an instantaneous means of communication between the two Oceans, it would aid greatly in the work of colonization; it would enable points, isolated in other respects, to express their wants and wishes,—settlements springing into existence a hundred or a thousand miles distant would always be aware of each others progress, and be made acquainted with important events as they transpire; and thus the pioneer, although for a time, remote from civilization and its accessories would, at least, feel less secluded by being within instantaneous hearing of them.

With regard to the disposal of land in the settlement of the country it appears to the writer possible to adopt a system

even more inviting to settlers, and certainly more advantageous to the country at large than "The Free Homestead Law" of the United States which comes into force on the commencement of next year. While any person over a certain age, by that law, may secure, in the United States, an unoccupied lot of land on payment of fees amounting in all to about \$15, and on cultivating the land for a period of five years, there is no provision whatever made for making the land accessible, the settlers must find their way in and out as best they can: the question and cost of opening roads and bridging streams is left entirely with the pioneer cultivators, and, in consequence, necessarily becomes a great drawback to general progress, as is always the case, when the opening of roads is left to individual fancy and exertion. It is believed that a better plan would be to give any one a farm lot, who, in return, would expend a certain number of days labour, under authorized direction, on the leading thoroughfares. Suppose, for example, the lands were laid out into lots of one hundred acres each, and that to secure a patent it was required of each occupant to give ten days' labour in each year for a period of ten years. Labour is the capital of an industrious, poor man; he has this to invest and nothing else; with it, however, he would thus be enabled not simply to secure a homestead, but one made valuable by good roads.

A concentration of labour in this way, year by year, on a "Territorial Road Line" previously established, would, in course of time prepare it for a railway track, while the occupation and cultivation of the land would prepare the country for railway service. This, it is true, would be a slow process, but one, nevertheless, which could not fail to prove certain

in its results, whilst at the same time it possessed the great recommendation of being inexpensive; a small outlay in the first place, and a systematic direction of industry afterward, would, in this way, cause the great Oceanic causeway to be developed by a natural and unfailing progress.

Were such a system as that which the writer has imperfectly sketched once adopted, and a sum not exceeding £400,000 expended on the construction of a simple, even a rude waggon or sleigh road, and on the erection of an electric telegraph on the best railway line within British territory, there would be no fear, it is confidently believed, of the final result. The rude waggon road would be the embryo of a great arterial steam communication from Ocean to Ocean; it would mark out the back bone of a country covering no less than sixty degrees of longitude, and which in the providence of events may become an important power on this continent,—whilst the telegraph would at once resemble the spinal cord of a national nervous system which must yet ramify in many directions throughout this great division of the Colonial Empire.

In concluding these remarks the writer has only to add that he has been encouraged to bring these crude suggestions together in the hope that, notwithstanding the humble source from which they emanate, they will not be altogether void of interest to those whose duty and high privilege it is to mould the destinies of a vast country; and who, looking to the future rather than to the present, are elevated above mere sectional views to a comprehensiveness of mind which enables them to deal with questions involving the highest national interests.

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