SOUTHLAND PROVINCIAL GOVERNMENT GAZETTE.

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ADDRESS
OF
HIS HONOR THE SUPERINTENDENT
OF THE PROVINCE OF SOUTHLAND,
ON OPENING THE
FOURTH SESSION OF THE PROVINCIAL COUNCIL.

FEBRUARY 21, 1863.

"MR. SPEAKER AND GENTLEMEN OF THE PROVINCIAL COUNCIL—

BEFORE entering on the subject of the important works, the consideration of which is the chief cause for your assembling on this occasion, I wish to make a few remarks on some other points which belong rather to the period that has passed since the close of the Session in November.

"Of the Bills that were passed in the last Session of this Council, all but two have received the assent of his Excellency the Governor; those exceptions are the "Criminals' Bill," which has been disallowed for the same reasons which led to the disallowance of a similar Bill which was passed in 1862 by the Provincial Legislature of Otago; and the Roads Bill, which has been returned with amendments which will be transmitted for your consideration. Of the other Bills assented to, the Interpretation Ordinance has been accompanied with a recommendation that one clause of the Ordinance which, in the opinion of the Attorney-General, militates against certain provisions of the Constitution Act, should be repealed. The same gentleman was of opinion that the Marine Boards Ordinance would be inoperative. On consulting other high professional authority, the Provincial Government learned that it was considered necessary to make more specific provision on certain points, on which it appeared to the Provincial Government that the provisions of the 33rd and 34th sections of the "Marine Boards Act, 1862," were sufficiently definite; as the authorities consulted, however, agree in this opinion, it has been considered advisable to prepare Bills on both those subjects which will shortly be laid before you. In the course of last Session, various Bills were brought into this Council, having reference to the constitution and powers of a Town Board. After a good deal of discussion, they were withdrawn on the understanding that they would form the basis of a new Bill, to be submitted to the Council in this Session. Accordingly a Bill has been drawn up which will be laid before you.

"Since the last meeting of this Council, a very rich gold-field has been opened out near the borders of the Province, on the shores of

the Whakatipu Lake. The facility of access to the Lake from the Southland ports, as compared with that from any port elsewhere, gave the control of the trade with the population which rapidly increased upon the field, to the merchants of this place—the supplies having for the most part, and for sometime almost exclusively, been sent from this Province. Many of the miners there have gone from Southland, and a number of gold buyers from thence also. The difficulty and hazard attending the transmission of the rough gold which those parties acquired, prevented them from forwarding it to their families or principals, as the case might be, or even from getting it deposited in a place of security: a considerable time elapsed, and gold continued to accumulate before the alternative was presented of sending it to Dunedin by the escort —a service which has only lately been established—and a very natural desire was expressed and reiterated in this place that the Government of Southland should provide an escort for the gold of those who wished to send it to Invercargill.

"The Provincial Government was quite prepared to establish an escort within this Province—a service, however, which would necessarily fail to meet the requirements unless connected with a corresponding service communicating directly with the gold-fields; and it was influenced by other considerations apt to be overlooked in the excitement of feeling, —it was of opinion that the duty of giving the protection sought for within the Province of Otago devolved specially on the Government of that Province; it had no desire to supersede the proper authorities in the performance of such special duties, and therefore, before determining on the extension of such a service into the Province of Otago, it endeavoured to obtain the co-operation of the authorities of that Province in executing a duty which it conceived would be most conveniently carried out by joint action, namely, to give each within the limits of its own Province the protection which was necessary to enable persons on the Whakatipu gold-field to transmit their gold to a place of security in either Province.

"As time passed, the necessity for such a service in the interest of Southland became more apparent. The acceptance of the alternative of sending their gold to Dunedin—after the escort thither began its functions—would subject those who desired to transmit their gold to Invercargill to considerable expense and delay before its value could be realized there; it became obvious also, after repeated communications, that no hope of a co-operation, such as above alluded to, could any longer be entertained; and then the Government, for the protection of the interests of this Province, established a Provincial Agency at Whakatipu, and organised an Escort from thence to this place.

"From the returns of the census of the Province taken in December, we gather evidence of progress on all sides. In December, 1861, the population was 1820, in December, 1862, it was 3455,—an increase of 90 per cent. The quantity of stock and extent of land fenced and in cultivation have also increased largely. A comparison of the shipping lists is equally satisfactory; in 1861, the tonnage inwards was 9099 tons; in 1862, 20,289 tons. The value of imports in 1861, was £55,240, in 1862, it amounted to £169,000. The value of exports in 1861 was £5131, in 1862, £19,471.

"The Revenue returns afford further proofs of prosperity; the gross Customs' Revenue in 1861 was £3401, in 1862 it was £11,763; and the Land Revenue in the past four months exceeds the average estimated in October last, amounting as it has done to £23,000.

"The chief reason for your assembling at this time is to consider the propriety of constructing a Railway between the Bluff and this place. At the time the Council was prorogued, it was expected that the elements of this question would be matured for deliberation at an earlier date, but various unforeseen causes occasioned considerable delay in the preliminary work. That is now done, and it is done well, and the delay is the less to be regretted since it has given an opportunity of obtaining an opinion of high value from a gentleman who has lately settled in this Province, and whose name is well-known as the engineer of different Railways in Great Britain, where he has acquired a large experience. To the Reports of the Chief Surveyor and Mr. Dundas, I can refer you with confidence for the details of the work, and the various matters connected with it, that incidentally arise in considering it. The work presents no engineering difficulties, either in curves or gradients; abundance of materials are close at hand along the greatest part of the line, so that it is practicable to construct the permanent way at a comparatively moderate cost. The estimate for the whole line—permanent way, stations, plant, and rolling stock, is £6500 a-mile. The work proposed will be of a substantial character, calculated to bear a heavy traffic with locomotive engines.

"In necessary connection with this work, it is proposed to make Jetty Works of considerable extent, without which indeed, at least at the Bluff, the Railway would be comparatively inefficient. Reports on those works and accompanying plans will be laid before you. I have to propose for your consideration that the sum of £120,000 should be raised by way of loan for the purpose of meeting the expenditure upon those specific objects. The allocation of this loan will be in the proportion of £105,000 for the Railway, and £15,000 for Jetty works; and it is proposed gradually to pay it off in twenty-five years.

"But another question of nearly equal importance and even greater urgency, is that of keeping open the communication with Whakatipu throughout the winter. The supplies of a producing population in the Whakatipu district, which at present numbers from 8000 to 10,000 men, will for the most part be sent from or certainly through Southland. The possibility of keeping up those supplies will depend upon the condition of the roads, and the experience of past winters has taught us that the gravel employed in metalling our roads, though forming an excellent way in

summer and for light traffic, is unable to bear even a considerable winter traffic. A heavy traffic in winter would soon render many parts impassable. Stone for road metal is distant, and, for the present, expensive, and it would be impracticable to metal any great extent of road before winter. Another alternative is open, namely, to lay down a horse tramway on the North Road at first, and if possible before winter, for about twenty miles from town to a point touching the gravelly plains inland, which, while unenclosed, form good natural roads, as an instalment of the plan of extending this way towards Whakatipu. The original expense of such a tramway would not much exceed that of a metalled road, while it would have the incalculable advantages of being capable of being laid down in a few months, and of becoming at once a permanent way—the expense of maintaining which would be trifling as compared with that of maintaining an ordinary metalled road, as the latter would require frequent renewal, each time, at an average cost little less than the original expense. The cost of carriage would be most materially lessened—the rural lands along the line would be opened out and enhanced in value, and, moreover the Tramway would at once begin to yield a Revenue. It is proposed that a rail should be laid on a part of the present highway so far as the lands on both sides is sold, and, beyond that point, that a line should be reserved for that purpose.

"In order to carry out this work it will be necessary that a loan should be raised for that specific purpose, and the sum I would propose is £130,000. The objects of those loans, amounting in all to £250,000, are for a Railway, a Tramway, and Jetty Works—specific works of a purely reproductive character, a class to which alone such loans are legitimately applicable. The repayment of those loans will be a primary charge upon the Land Revenue—the capital of the Province—and when by its means we shall have repaid the debt incurred in constructing such works, the transaction will be equivalent to a re-investment of a part of that capital in such a way as to render it a permanent source of local revenue.

"In intimate connection with this subject, arises another to which I desire to draw your attention. It is well known to this Council that in the past few months a marked advance has taken place in the value of fixed property. The upset price of rural Waste Lands of the Crown is now below the market value. The increasing commercial prosperity consequent on the influx of population and capital has given to it, theoretically, a greater value, and the experience of every day shows that this is realised in fact. I have to suggest for your consideration the propriety of raising the upset price of rural land. An increase of price, while it would directly tend to discourage speculation, would not deter the *bonâ fide* settler from buying land for cultivation; and though the best lands in the neighbourhood of the town have passed into private hands, the extension of roads and settlements is opening up districts in the interior, a large extent of which, yet unsold, is as well adapted for agricultural purposes as any in the Province. This applies in an eminent degree to the line of country which will be opened up by the prosecution of the Tramway to Whakatipu. The report of the Chief Commissioner shows that a large extent of land on that line within a moderate distance of the town, is peculiarly well adapted for settlement, and the extension of that work will unquestionably increase its value. It will be seen from another report of the Chief Commissioner that the extent of unsold arable land in the Province is estimated at about 761,000 acres, exclusive of much excellent land in valleys in the northern parts of the Province which will ultimately be available.

"In case you should upon deliberation come to the conclusion that the price of rural land should be raised, I have to suggest that it would be desirable at the same time to give expression to an opinion upon the question of the advisability of adhering to the Improvement Clauses under altered conditions of price.

"Gentlemen, it denotes no undue presumption to anticipate that, with an excellent harbour, the nearest to Melbourne of the New Zealand ports—the terminus of the Southern Island Telegraph—having ample wharf accommodation and other facilities for a rapid discharge of cargo—a Railway from the Port to the Capital—easy access to the richest Gold-field known in the island, such as will give to this place the command of the market of a large producing population there, and in all directions to rural districts which present attractions for settlement inferior to none in any colony, and capable of sustaining a dense population—the prosperity of the Province will be assured, and that prosperity will continue because it will be mainly based upon permanent conditions.

"In carrying out a course of action which will tend to promote such a result, the Provincial Government relies on the support of this Council to enable it to take advantage of that "tide that leads to fortune," and which occurs but rarely in the history of communities—which is now flowing for this Province, and which, if the Government and Council display energy and intelligence equal to the occasion, will shortly give to Southland that influential position among the sister provinces of New Zealand to which her geographical position and latent resources alike entitle her."

REPLY OF THE COUNCIL.

SIR,

It affords this Council much satisfaction to learn that the finances of the Province are in such a healthy state, and that its commercial prosperity, as indicated by the Customs' returns, is rapidly advancing.

We entirely concur with your Honor's estimate of the importance to the future progress of this Province of the great works which are now contemplated, and the measures connected with them will receive our most careful consideration.

The question of an alteration in the price of rural land, and the collateral one of an alteration in certain clauses in the Land Regulations will also receive our serious attention.

And we agree with your Honor in the hope that the result of the deliberations of this Council, followed by the action of the Government, will tend to promote the prosperity of the Province, and to establish it on a secure basis.

CLOSING ADDRESS. March 6, 1863.

Mr. Speaker and Gentlemen of the Provincial Council—

The business of this Session having now drawn to a close, it will be my duty to transmit to his Excellency the Governor the following Bills which you have passed, with the expression of my own concurrence therewith, viz :—

1. The Interpretation Ordinance, 1862, Amendment Ordinance,
2. The Marine Boards Ordinance,
3. The Town Board Ordinance,
4. Bluff and Invercargill Railway Ordinance,
5. Debentures Ordinance,
6. Diversion of Roads Ordinance,
7. Appropriation Ordinance,
8. Sheep Ordinance, 1862, Amendment Ordinance,
8. Roads Ordinance, 1862, as amended.

Whenever the assent of the Governor shall have been given to the Railway and Loan Bills, immediate steps will be taken by the Provincial Government to commence the work without delay. In the meanwhile, no time is lost, as the engineering staff will be for sometime engaged in elaborating the details of the preliminary work.

As you have, after due deliberation, agreed that it is not advisable to lay a Tramway on the North Road, it will be the duty of the Government to use every effort to put the North Road in the best state of repair that the time and circumstances will permit, in conformity with your resolution on the subject.

I have to thank you for the care and consideration with which you have gone through the business of the Session. The unwearied attention you have devoted to the measures submitted to you, shows that you appreciate the importance of their bearing on the future of the Province; and I entertain a confident hope that our mutual anticipations of their beneficial effect will be fully realised.

I have now, Gentlemen, to release you from further attendance, and to declare that this Council is prorogued.

THE CHIEF SURVEYOR'S PROGRESS REPORT ON THE GREAT NORTH ROAD.

Survey Office, Southland,
20th January, 1863.

Sir,—

THE various works on the Great North Road designed by me, and contracted for by the Provincial Government, were calculated only to make the line viable throughout, and, as preliminary to the regular detail of road-making, which would, in any case, have become necessary from time to time as the traffic increased; it was then contemplated that at first almost the only traffic would have been the drays from the sheep stations, and that forming and gravelling would only have been very gradually required as portions became poached, but even had an immediate necessity then existed for making good the road throughout, it would have been hardly possible to have properly specified the work until after the forest lines had been cleared of timber and the streams and swamps bridged and drained.

From circumstances connected with the advance of the gold-fields, these works have been delayed far beyond the time limited to the contractors; but as they are now all advancing to completion, and since Lake Wakatipu commerce promises to become of first-rate importance, it is now necessary to provide not merely for immediately opening this as an available track, but, if possible, for making it a good road, safe to endure the wear and tear of heavy traffic through the winter.

As the line for about thirty miles runs on level land with good alluvial soil, it is clear that this can only be done by forming and metalling it throughout or by works equivalent to this; the drier plains where the natural surface would stand traffic being so inconsiderable and so detached that it is hardly worth while to accept them, since on these also, the same operation would become necessary a little later.

Still some portions require this improvement more urgently than others. A contract has accordingly been set for forming the road in the Winton Bush, about 100 chains, and a specifiation has been drawn for forming it across the Winton Flat, nearly four miles; it is also immediately needed on the Limestone Flat, north of Winton Bush, about five miles in all, but of which about one or one and a half miles might for the present be omitted, and one other portion—about one and a half miles in length—north of the Limestone range, on Mr M'Lean's run, is quite impassable until so improved.

A cutting in siding will also be required at the northern extremity of the middle bush cutting (on the south flank of the Limestone Range), and several other jobs may be required in these bush cuttings which it is impossible to specify until the clearing is complete, which will not be less than two or three weeks.

These are the only portions of the road which are at all bad now; but it is impossible to forget that no part south of the Dipton Flat will stand any heavy winter traffic without metal, and that even the now excellent road from the Waihopai Bridge to Wallace Town, and from the Tomoporakau on to the Winton Flat, would, under such a trial, become an adhesive bog in the months of August or September.

Now, the gravelling alone of these two portions would probably cost fully as much as draining, forming, and gravelling the parts

above named (Winton Flat, &c.), since there is gravel in the immediate neighbourhood of the latter, but not of the former. In neither one case nor the other could it be done for much, if at all less than £550 or £600 per mile, and experience proves that even when so done the permanent condition of the road is very slightly guaranteed; indeed, on any road subject to considerable traffic, I should, myself, only consider gravel as forming a ballasting on which broken stone could be advantageously placed, or at all events as requiring constant renewal in places where gravel is conveniently available.

Since no stone of quality suitable to road metal can be had nearer than the Mokomoko Range, the only contract for supplying it may be taken as a basis of cost, namely, 14s 6d per cubic yard at Invercargill; a 6-inch coat of metal, 12 feet wide carried on to a distance of say eight miles, would, at that rate, not cost less than £1100 per mile at the very least, and such a coat would be too light except upon good ballast, such as gravel.

The conclusions, then, to which I come are:—

1st, That to make the road passable for medium traffic, and in ordinary seasons it is essential, in addition to contracts now set, and some minor ones on the hills, to form and gravel:—

Winton Flat, say.....	3½ miles	
Limestone do	4 ,,	
North of Limestone do..	1½ ,,	
	9 miles at 600*l*...	5,400*l*
Winton Bush.....	1¼ ,, 400*l*...	500*l*
		5,900*l*

2nd. That to make it available for *considerable* traffic through the winter it would be necessary, in addition—

To gravel from Waihopai Bridge to Wallace Town, say 4½ miles at 800*l*.....	3,600*l*
From north end of Wallace Town Plains to south end of Winton Flat, 5½ miles at 500*l*.....	2,750
	6,350*l*

And 3rd. That if, when all this was done, a heavy traffic should be kept up through the winter, the road would suffer so much deterioration that it will be necessary, next summer, to re-metal the whole road; the southern portion with broken stone, the remainder with gravel, at a cost which would probably average 500*l* per mile over the whole 35 miles.

Instead of incurring this considerable and constantly renewing expense, a tramway has been suggested, especially of that description proposed by Messrs Cairns and M'Kenzie, consisting of a flat rail of considerable breadth, suitable for ordinary vehicles of the average gauge.

Such a road could be laid down very nearly, if not quite as soon as a gravelled road could be made, and its permanent goodness through the winter, under any amount of increase which the traffic might undergo would be secured; and the cost of maintenance would be insignificant, but the first expense would be very considerable.

I apprehend that such a tramway, with rails of about 40 lbs. to the yard, with occasional sidings, to allow vehicles to pass in opposite directions; the rails laid on longitudinal sleepers, 9 x 6, with transverse ones 5 feet apart, the latter bedded in gravel 6 in. deep beneath them and filled in to level of rails with broken stone, say 8 feet wide, would cost about £2200 per mile, in addition to cutting side drains and forming the road where necessary.

If such a road were adopted, it should be carried from town to the foot of the Limestone Ranges, on Mr M'Lean's station, about 28 miles; of this, full 12 miles are already formed and drained, or will immediately be so, and the cost of the tramway would be roundly as follows:—

Say 12 miles way as above, at £2200.....	£26,400
16 — including forming and draining, at £2600.....	41,600
1½ miles north of, forming and draining.....	3,900
Additional sidings, occasional small cuttings to ease short gradients, &c.	3,100
	£75,000

There is no doubt that this line is eminently suitable for such a tramway; the natural levels are as good as can be desired, with the one insignificant exception of the Limestone Range, over which it might be carried as a common road.

The road so made would be all through fine agricultural land; would constitute, undoubtedly, the main artery of the Province—of great importance, even apart from the Lake traffic. After reaching the Dipton Plains no other serious obstacle could arise; that plain is, in fact, a naturally formed road, and very moderate improvements, in addition to those in progress in the fine valley known as the Dome Pass, and from thence by the valley of the Mataura, would be all that could be required for a long time, the road being over level gravelly plains, on which, if one track should become poached, a new one can be taken by side of it; so that, although the distance from Invercargill to the foot of the Lake is 89 miles, I may fully and confidently assert that the completion, in a really permanent manner, of these 35 miles from town, would place all this communication on the most certain and satisfactory basis.

I have the honour to be,
Sir,
Your Honor's most obedient servant,
THEOPH. HEALE,
Chief Surveyor.

To his Honor
The Superintendent,
Province of Southland.

REPORT OF COMMISSIONER OF CROWN LANDS ON THE UNSOLD AVAILABLE AGRICULTURAL LAND IN THE PROVINCE.

Waste Land Board Office,
23rd February, 1863.

SIR,—

IN accordance with your Honor's request, I beg to submit an approximate estimate of the unsold available Agricultural Land in

the Province, comprised within the following boundaries:—On the south, the sea; east, Mataura River to its junction with the Tomogolot Creek; north, a line due west from the said junction to the foot of the Takatimo Mountains; west, the Waiau to its junction with the Wairaki, thence by the Wairaki to its source, and thence by a line running north-east along the foot of the Takatimos till it cuts the Northern boundary. Total acreage, about 761,000.

I have stated that this estimate is only an approximate one, the system of survey under which it is made—that of reconnaissance, necessitating a very rude approximation as to the actual area, though from the knowledge I have acquired by having ridden over the greater part of the country in question, I am inclined to think the quantity as rather under than over estimated.

Of this land, a large proportion is in the unsold parts of the Oteramika and Jacob's River Hundreds and Block set aside for sale under the Land Sale and Leases Ordinance; that in the Hundreds is superior in quality, within easy access to the seaboard, and in the Oteramika having a forest of some 10,000 acres of superior timber to supply all the requisites which agricultural settlement demands; while the settlement and occupation of a large part of the sold portions of course enhances the value of the remaining part. Of the land in the 2,000 acre blocks, that abutting on the Main North Road I have reported on in my letter of 3rd instant; but, irrespective of this, there is a very considerable area to the east and west of the tract of country shown in the sketch enclosed in that report: on the east bank of Jacob's River, from the Yellow Bluff to the south boundary of Run No. 135, there is a belt of very superior agricultural land, the soil being a rich black loam, several feet in depth, a perfectly level plain. This, although denuded of timber, has easy access to the Spar Bush, in the New River Hundred, of several thousand acres, the timber in which is superior to almost any other bush in the Province. To the east of Forest Hill, in what are called the Waiopai Plains, the land is undulating and in some places inferior in quality as regards agriculture, though admirably adapted for sheep farming on a large scale in paddocks. It is well watered by three or four large creeks, the Makerewa, Dunsdale, Hedgehope, Linhurst. In this block of land, however, is included some of very superior quality for agriculture, such as part of the Mataura Plains, adjoining Mr. Holmes' purchase, the country between the Waimumu and Charlton Creeks, the Mabel District (the small portion of which, when thrown into the market, was eagerly competed for, fetching from £1 3s. to £2 6s. per acre), the north-east and part of the southern frontage of the large Bush on the southern slopes of the Hokanui Hill. There are also some fine limestone valleys between the Forest Hill and the west side of the Hokanui Bush, referred to above, drained by the Makerewa. The Mabel District, and a considerable quantity of land to the east of the township of Gore will obtain timber from the large reserves in the Makerewa Bush, while the country to the north of the Linhurst has the inexhaustible Hokanui Bush to look to for supplies: through this district in a north-easterly direction runs the main road to Dunedin.

Of the lands within licensed runs, I may state that I have included in my estimate only the plains lying at the foot of the various mountain ranges and along the banks of the Matanra, Oreti, Jacob's, and Waiau Rivers. Of these, the nearest to the seaboard, on the Mataura Plains, is Run No. 97, the superior quality of which is too well-known to require mention; next, also on the Mataura, are the Waimea Plains; of these, the greater portion is good dry land, that between the Charlton and Waimea Creeks very superior, the whole perfectly level, and the major part singularly free from swamps—land on which the steam plough might operate at once.

The large patches of bush on the eastern and north-eastern frontages of the Hokanui will furnish timber to this block. The greater part of the plains on either side of the Aparima are good land, that on Runs 135, 153, and the southern portion of 133, superior; they are well watered and bush is easily attainable, the Waiau Plain is a remarkably fine one, being perfectly level, with patches of bush scattered over it, and considerable quarries of limestone, with easy access to the seaboard. Approaching nearer still, the land on Runs 156, 142, and 128, is equal to any in the Province, particularly the two latter lying between Otautau and the Longwood Range Bush, and having a north-easterly frontage of some fifteen miles to the latter, it is peculiarly adapted for settlement, not only for the small farmer but for men of means desirous of making a home for themselves.

In this estimate I have excluded the numerous valleys of the Hokanui, Taringatura, &c., hills, many of which possess good soil, timber, and water, as also the slopes of the hill themselves. Where cultivation could be, and doubtless will, when the necessities of population require it, be carried on profitably, the whole north-east frontage of the Hokanui, for instance, would, I imagine, yield a good return to the agriculturist. When lately at Captain M'Callum's station, at Otapira Bush, I saw a finer crop of oats on one of the slopes, entirely away from the bush than I have seen anywhere this year, in Southland.

I may state that all the land south of Block III, Invercargill Hundred, on to the Mokomoko and to the west of the proposed Railway, from the Bluff to Invercargill, lying between it and the estuary, is unsold; the greater part of it, though swampy, is capable of improvement by drainage, and as I presume, there will be frequent stations along the line of rail, its position will ensure its realizing a large price, it being admirably adapted for grazing paddocks or growing hay.

In conclusion, I have the honour to state, that although the Province has been not more than one-and-three-quarters years in existence, and the revenue considerable, only 53,731 2·38 acres of land had been escheated from the Crown up to the 31st December last; and looking at the large quantity of land still

unsold in the Hundreds, and 2000-acre Blocks, I believe that with judicious management there will be no occasion to interfere with the runholders before the expiry of their licenses, and that thus, while deriving a large and steady revenue from this source, there will be ample security to offer, should the development of the Province necessitate the raising of large sums on loan.

I have the honour to be,
Sir,
Your Honor's most obedient Servant,
WALTER H. PEARSON,
Commissioner of Crown Lands.

To His Honor,
The Superintendent,
Province of Southland.

REPORT OF THE CHIEF SURVEYOR ON THE PROPOSED BLUFF HARBOUR AND INVERCARGILL RAILWAY.

Survey Office, Southland,
16th February 1863.

SIR,

I have the honour to submit herewith two Maps showing the course of the proposed Railway from the southern boundary of Invercargill to the western one of Campbelltown, together with a longitudinal section of the line throughout.

In designing the Railway, it has been judged necessary at present to stop short outside of both towns, but there can be no doubt that when this line becomes the mode of transit for goods in considerable quantity landed from ships at Campbelltown, or at the Lower Harbour, it will be necessary to construct an extension, for goods' trains at least, along the outer side of Gore-street to the Jetty. A similar goods-extension from the Invercargill terminus through Annan-street to the mouth of the Puni Creek may also hereafter be required.

With a view to these future extensions, the termini have been so placed as to admit of the rails being carried on by two short curves, in either case without interfering with the present stations. That at Invercargill has been fixed on the western portion of one of the blocks of the Town Belt, immediately opposite the south end of Clyde-street. This piece of land is swampy and part of it submerged; it is quite unfit for the ordinary objects of a Town Belt (ornament or recreation), and is admirably adapted in every respect to the purpose to which it is now proposed to apply it. The Station will front the most important street in the town. The proposed Jetty at the south end of Annan-street will be immediately on its left, and the highroad to the Bluff and the south country on its right; it will thus be in the very centre of the traffic, while it will be perfectly out of the way, and cannot in any degree interrupt any desirable communication. This block of the Town Belt, including an imaginary road outside it, contains a little more than ten acres: of this, I propose that nearly one-half, being the dry portion, should form a green or garden fronting the side entrance to the Station. The necessary road and approaches will occupy nearly one and a quarter acres; the remaining four acres will be appropriated to the purposes of the Railway. It will only be necessary at present to fill in about two acres; this will require about 7000 cubic yards of material, and will involve a cost of £1000. Should the Government think proper to go on with the Jetty plans proposed for the south-west angle of the town, the station might then be extended, and this work would materially assist in making a handsome, a most convenient, and in every way desirable termination of the town in that direction.

The site of the Campbelltown terminus has been fixed on a piece of land, about three acres in extent, at a very convenient spot immediately abutting on the town; the greater part of it is on the property of A. M'Nab, Esq.

The Railway proceeds from the Invercargill Station by a straight line outside high-water mark for a quarter of a mile, then by two curves of 60 chains radius—64 chains long together, the line just touching Sections 3 and 4, Block III., passing through Sections 5, 6, 7, 8, 9, and crossing the present highroad in Section 6, and again in Section 9. This road has been made from time to time as convenient, and without reference either to the most direct line or to the road as laid down in the Survey Map; it is therefore very crooked, and it will be necessary at two places to divert it to the inland side of the Railway: this will bring it much more nearly to the position originally designed for it in Block III., and in both cases will shorten it and eliminate objectionable angles.

From the end of the curve in Section 7, the line proceeds straight one and a half miles, passing for the most part on the flat immediately below an elevated terrace, one salient point of which it crosses: all this is on excellent ground, nearly level, the sub-soil being gravel at a moderate depth. After leaving Block III., the line nowhere touches private property until it reaches Mr R. Dalrymple's boundary, 250 chains from the Station. It will necessarily pass quite through this estate about thirty-seven chains. Shortly before reaching it, the line takes a short curve to the east, with a radius of sixty chains, and again crosses an angle of the road, involving a second divergence of the latter. At three miles from the terminus, commences a curve of 100 chains radius concave to the westward, which is continued nearly two miles. In the course of it the line crosses the Waimatua and Mokotua streams, the only considerable ones which occur in the whole distance between Invercargill and Campbelltown; their breadth scarcely exceeds thirty feet, and pile bridges of four bays of ten feet each will answer every purpose. The land on either side of these streams is peaty and wet, but it has a sound bottom at a depth seldom exceeding three feet; and as the line crosses a point of the high gravel terrace between the streams, and again rises on to elevated ground immediately beyond them, the material lies quite at hand for the low embankment required (as well as for ballast); and the expense of constructing all this portion of the line may be taken at the minimum, requiring little beyond ditching and forming: the same

may be said of the continuation of the line to some distance beyond the trigonometrical station G.

From that point the line descends on to the great swampy flat which forms the continuation of the Seaward Moss westward to the New River Estuary. This flat was, and in part still is, very wet; but where the road crosses it, it has a sound bottom of hard sand, at a depth hardly anywhere exceeding three feet, and in those parts to which outfall drains have been completed, it has consolidated quite sufficiently to admit of an excellent road being constructed over it by a light embankment laid on fascines, for which superior material is at hand. The line is carried over this flat in a curve of 200 chains radius, the distance from the foot of the terrace at G to the rise of the Mokomoko Hills being two and a-half miles. The Mokomoko range is the only eminence on the line which involves either steep gradients or else heavy earthworks to avoid them; the summit is only thirty-eight feet above the formation level on the embankment across the little inlet at its southern foot; but it rises abruptly from the sea on one side, and from the level plain only six feet above high-water mark on the other.

As the range is of hard stone it is proposed in the first instance to make shallow cuttings only, and to cross it on gradients of 1 in 58, twenty-four chians long each. But as this stone will be a very marketable commodity in Invercargill, and as its conveyance for road metal, as well as for sills, steps, foundations, and similar purposes, is looked upon as one of the resources and objects of the Railway, it is intended to carry in by the side of the line a narrow quarry face or cutting for its supply; the bottom of the cutting may be kept at a very easy gradient, and when it is completed throughout the rails may be removed into it. For the supply of material for forming and partly ballasting the line across the flat, a short siding may be run in to the foot of the hill from the west side; this will also afford a permanent quarry of indefinite extent. A branch line one mile and a quarter long is designed to leave the main line at about eight miles from the Invercargill terminus, and to reach the shore of the New River a little north of the Mokomoko Inlet abreast of the Horse Shoe Channel. The greater part of the land in that vicinity consists of fine sandy flats, with a fertile peaty soil of varying thickness; it is almost entirely dry or easily to be made so. The superiority of the facilities which this spot affords for shipping over any other part of the New River is remarkable. This was early seen, and on Mr. Thomson's original map, as well as on the Admiralty charts, it is marked Lower Harbour. At this spot alone can wharves be made fit to accommodate large ships in proximity to the shore; the channel there is narrow and deep; the shoal opposite, dry at half-tide, will protect the wharves from any sea or serious ripple, and immediately above and below it the channel opens out to a space sufficient to accommodate a great number of ships at anchor. Looking at the facilities which this spot alone presents, I cannot doubt but that as the commerce of Invercargill enlarges this will be its harbour.

From the Mokomoko range the line crosses a narrow cove of the Bluff Harbour on an embankment eighteen chains long, and then enters the forest, proceeding for $2\frac{1}{4}$ miles on curves of large radius, crossing the points of land which project into the Harbour, and skirting the heads of the indenting bays. On reaching the south-westernmost of these, known as Archie's Bay, a curve becomes necessary somewhat sharper than any of the others—its radius is thirty-five chains, which is not at all open to objection; it is thirty-six and a half chains long, and eighteen and a half chains of it is on an embankment having a maximum height of ten feet. From its termination the road is straight for nineteen chains, and then runs on to the station by three curves of forty chains radius each, skirting the shore, and occasionally coming on to the beach. The whole length of the line is fifteen miles and four chains, besides the branch at Mokomoko, one and a-quarter miles.

From Invercargill to the foot of the Mokomoko hills, the highest part of the Railway will be only twenty feet above the lowest; the cuttings will be only just sufficient to furnish material for forming the lower parts, and the steepest gradient will be one in one hundred and seventy-six. The short steep rise over the Mokomoko hills will be only temporary; below that the ground is very irregular, but no gradient there will be steeper than one in 104, and the cuttings will nowhere be more than ten feet deep.

In the very heavy forest which borders the Bluff Harbour considerable difficulty was experienced in selecting the best route. A trial line was laid off approximately, in right lines, and cleared so as to admit of levels being taken throughout; a great part of the cleared line has been permanently adopted, but it has been found necessary to modify one portion of it considerably: a line with very practicable levels has been obtained by cross sections from the cleared roadway, but as the new line has not been cleared so as to admit of its being accurately set out, a limit of deviation of three chains on each side has been taken, in order to include any alterations in detail which may be found necessary. This is far within the limits of deviation customary on Railways in England.

The high road has been constructed from Invercargill towards the Bluff in a direction roughly accordant with the line selected for the Railway as far as the terrace beyond the Mokotua stream; from thence a temporary road has been made striking out on to the beach of the New River Estuary, and the present land communication with the Bluff is kept up by following that beach, when the tide is out, up the Mokomoko inlet, crossing the neck of land intervening between the two harbours on a road which, after a large outlay on it, is still of a very temporary character, and then continuing in like manner along the beach of the Bluff Harbour. Works are in progress for the construction of the high road, by the side of the intended railway across the Mokomoko hills, and it is hoped that these

will be completed, together with the continuation to the present termination of the road beyond Mr. West's, before winter, so as to make the communication independent of the New River and Mokomoko beaches, and to shorten it full four miles; but from the Mokomoko down to Campbelltown the high road will be everywhere by the side of the Railway, and it will be much the most economical, in fact, almost the only practicable way to construct both together. This has been provided for in the estimates, and it necessarily swells the amount considerably beyond what the Railway alone would have cost.

It is desirable that the highway should be everywhere on the inland side of the Railway, that is east of it down to the Mokomoko, and west of it below that point; the high road will therefore cross over the Railway at the northern foot of the Mokomoko hills.

From the description given, it will be seen that the curves and levels on this line are, with this one small and temporary exception, quite equal to those of the first-class railways in England. The ground over which it passes has all quite a sound bottom, with the exception of about one mile of peat on the north flank of the Mokomoko hills: that one piece of soft ground is very favourably situated for drainage; the surface consists of a tough fibrous mass which, when drained, shrinks, and, to a great extent, becomes solidified, so that, when covered with fascines and a low embankment, as has already been done with the high road, it will sustain a way which, though perhaps in some degree elastic, will be as secure and as little subject to wear and tear as any other portion.

The embankments are quite light, the largest being only ten feet high, and eighteen chains long, and the only bridges required are three timber ones of three bays, each of ten feet span, and one of one bay only.

The roadway must in any case be carried throughout a great portion of it on a low embankment, and the cuttings made sufficient to supply the material for it. The same course would have to be adopted, even if it were required only to construct a high road, and when done it will be quite sufficient to carry any description of road; if then it should be determined to place upon it a very light permanent way, no saving would be effected on the substructure.

Now, almost the whole commerce of Southland will pass over at least a considerable portion of this line. That commerce more than doubled itself last year: with the impulse which the colony will receive from this and other large works in progress, in addition to other causes in operation, it may be expected to undergo at least another duplication in the present year: it would appear then to be a most mistaken economy to place on a road otherwise so excellent, a permanent way which would be unequal to the largest increase of traffic which circumstances render probable, especially considering that even should the traffic for sometime remain small, the wear and tear of a substantial way is far less than that of a light one.

In determining the kind of permanent way to be adopted, the choice lies essentially between

1st. The very heavy and solid structures which have been employed on the Australian lines, of which the guage is 5 feet 6 inches.

2nd. The very light one adopted on the Dun Mountain Railway, designed by Mr. Doyne, and recommended for general use with some modifications by Mr. Fitzgibbon, of which the gauge is from 3 ft. to 3 ft. 6 inches, or the equally light tramway for common vehicles proposed by Messrs. Cairns and Mackenzie; and

3rdly. Some way intermediate between these extremes, the most feasible of which, by far, is the old established English narrow guage of 4 ft. 8½ inches.

With regard to the first it is not necessary to say much. It is quite clear that the ordinary narrow guage is fully equal to any wants this Colony can have, and every increase involves additional expense; even a less guage would probably produce little or no economy, since all patterns and fittings in the English factories have been so long adapted to that particular guage that any departure from it creates trouble and expense. If then any departure from the ordinary guage should be adopted here, it surely would not be in the direction of increase.

The so called Dun Mountain Railway is in fact a very slight tramway; the guage is only three feet, the rails having a weight of thirty pounds to the yard, and the line being laid on gradients of one in eighteen, and with curves ranging from one to ten chains radius. Such a structure is admirably fitted for the very difficult country which it traverses, and is a great triumph of skill over the greatest natural difficulties, but it is quite unfitted for locomotive traction, and it would be absurd to use it on an excellent line where none of the the difficulties exist which it was specially designed to surmount.

The adoption of a tramway would not effect any very great saving in first construction over the description of road which I recommend, but if fitted for ordinary vehicles, its use would avoid the necessity of any rolling stock whatever, and would reduce the Stations and Staff to a mere establishment of toll collectors.

In an agricultural district such a line would present the most obvious advantages. I have already pointed out in a special report its applicability to an inland line in this Province, but for a communication between the capital of the Province and its ports I think it would be altogether inappropriate. On this line there would be few or no vehicles belonging to private parties requiring transit, since all the traffic would consist of goods and passengers landed from ships, or of stone quarried on the line; and if the traffic is to take place only in the carriages belonging to the Railroad there can be no doubt that it could be more economically carried on in the larger and stronger carriages suitable only for a Railroad, than in carts better adapted to

common roads. Moreover, the traffic on this line will at times, at all events, such as on the arrival of several ships together, be so considerable that common vehicles would certainly never satisfy the wants of the public; the quantity of stone which is likely to be required both for the roads and for building purposes, would alone keep such a line in pretty constant occupation with a great establishment of horses.

My own conclusion then is, that the only description of permanent way which will be at once sufficient and really economical, either with a large or a small traffic, is one of the ordinary narrow guage, substantially laid with rails not less than 70 lbs. to the yard, on transverse sleepers every four feet; or with bridge rails on a longitudinal sleeper of equivalent strength; and that as locomotive traction will certainly be required at a very early period, it will be most economical to introduce it from the first.

I have therefore adopted this principle as the basis of the plans and estimates submitted.

A single line of rails only is required with sidings at the two termini; these with the one leading into the quarry in the Mokomoko hills, and the branch line to the Lower Harbour, will for some time to come, at all events, supply all requirements for crossing.

It is proposed at present to confine the outlay under the head of Stations to the narrowest practical limits, to construct them wholly of wood and of no greater extent than will be necessary to accommodate the first year's traffic.

The Invercargill Station will comprise:—

1st. Booking Office and Manager's House, with Office and Board Room, 52 x 30, of two storeys.

2nd. Passengers' Platform, on both sides of the line, 80-ft. long, 15 wide.

3rd. Shed covering the above, 90-ft. long, 40 wide. A projecting wing on the east side of this will serve for lamp room, left luggage, porters, &c.

4th. A siding elevated on piles, to leave the line south of the station and rising one-fortieth for 320-ft., for the delivery of road metal and other stone above the level of drays.

5th. A short siding to the westward will lead to a small repairing shop, 50 x 30.

6th. Coke platform and water tank.

Campbelltown Station—

1st. Booking Office and Clerk's Residence.

2nd. Passengers' Platform, single.

3rd. Shed over the above, 50 x 30.

4th. Coke shed and water-tank, with pump.

At the Mokomoko—

Station, 40 x 20, and Passengers' Platform.

A Goods Warehouse will soon be required at Invereargill, but it is not provided for in the estimates.

The rolling stock enumerated in estimate No. 3, will be sufficient only for a commencement. Another engine and additional trucks will be required should the increase of traffic be great.

The passenger carriages have been put down at a low figure, on the assumption that the expensive luxury of very highly finished carriages would be out of place for the present.

A very careful consideration of these various estimates, with all the aid I could obtain from inquiry, and from the suggestions of a gentleman of great experience, whose assistance I have thankfully to acknowledge, convinces me that the work can be executed for the sums named, though I am well aware that the disproportion of these estimates with the costs of railways in Australia may at first sight subject them to some doubt. The causes however of this disproportion are easily explained.

1st. The line is all but level throughout.

2nd. It does not include a single engineering difficulty, nor even any one extensive work.

3rd. All unnecessary work is rigidly excluded; the whole line being of the plainest and cheapest character consistent with safety.

4th. The expenditure on stations is unusually small; and

5th. The usual heavy items of land compensation and law are in this instance so small as to be almost insignificant.

It is almost impossible to make any safe estimate in detail of the traffic which this line will enjoy. The growth of the trade of the Colony is so rapid that expectations, though based on the actual experience of the whole of the short time during which the Province has had a political existence, and though far within what the best informed residents know to be probable, would appear in more settled communities or to persons not acquainted with the natural resources of this part of New Zealand, to be extravagant; and might tend rather to weaken than to establish confidence in the prudence of the undertaking.

To show the advancing condition of the commerce of the Province, it may be sufficient simply to state the Tonnage Returns for the years 1861 and 1862:—

Southland Ports, Year ending 30th September:—

Tonnage Inwards.	Foreign.	Coastwise.	Total.	Estimated Imports.
1861.....	5,300	4,161	9,461	£38,618 1 0
1862.....	22,248	12,308	34,556	132,325 15 0
Tonnage Outwards.				Estimated Exports.
1861.....	4,671	5,531	10,202	£3,564 10 0
1862.....	16,611	19,848	33,459	19,673 14 0

The consideration of such a return will shew how completely hypothetical any estimate of the tonnage of 1864 must be, and on this railway the variation of the traffic will be pretty accurately represented by that of the shipping.

But it can hardly be necessary to attempt any detailed traffic returns. It will be sufficient to show that an immediate traffic is available quite equal to cover the current expenses and to afford a moderate return on the capital expended. It is impossible to doubt the great future development of it, and the expediency and prudence of constructing

this Railway can easily be shewn on broader and safer grounds than any which could be deduced from the actual communication now going on between Invercargill and Campbelltown.

This line will not depend on any mere local trade between these places, but the traffic on it will vary with the rise of the whole commerce of Southland.

The vast plain lying between the lofty mountains of the West Coast and the ranges of the Molyneux, and extending to the Lakes Wakatipu, Manawapouri and Te Anau, is so situated that Invercargill must ever be its only commercial centre, and the New River and the Bluff its ports for foreign commerce. It has it is true, two other ports, one on each flank of the Province — Riverton and the mouth of the Mataura—and these will no doubt enjoy a considerable share of coasting traffic, and become the commercial centres of the districts which surround them, but neither can in any degree compete with the Ports of Invercargill and the Bluff for foreign commerce, but will rather be feeders of it. The whole foreign commerce therefore of the Province will pass on this line, connecting the ports with the town, except such portion of it as may continue to come up to Invercargill in small vessels and lighters.

The resources then of the whole Province, and the prosperity of its growing commerce, are the measures whereby to estimate the necessity for and the future activity of the Railway.

Of the greatness of these there can be no manner of doubt, and the only question which can arise is one of time. Is it well to construct it now, or should it be delayed until the commerce shall have already arrived at such a pitch that it cannot get on without it?

But the progression is so rapid, that before the Railway can be completed, that time will have arrived, if, indeed, it has not come already: one want, that of stone, both for the roads and for building purposes, which cannot be supplied at a reasonable rate except by this line, is already most pressing, and the deficiency of means of bringing up goods and passengers from Campbelltown is becoming an intolerable grievance, and is beyond question now seriously cramping the trade and population of the Province.

If moreover it be admitted that the Railway is an ultimate necessity, then the sooner, the Colony has the benefit of it the better. In any case, such a work must be executed with borrowed capital, and the Crown Lands must be the chief security of the Loan; but these lands must be at least as good security now as they will be hereafter, when large portions will have been sold. I infer then that the requisite capital can be obtained now as well as at any future period, and if so, it is surely desirable that it should immediately be invested in an undertaking in which it could fructify so greatly, and be certain not only to realise a great direct return, but also to advance every interest in the Colony, and expedite the developement of its unrivalled resources.

I have the honour to be,
Sir,
Your most obedient Servant,
THEOPH. HEALE,
Chief Surveyor.

His Honor the Superintendent,
Southland.

ESTIMATES.

No. 1.—Permanent Way, per Mile.

Rails, 75 lbs. per yard, say 120 tons at £12 delivered	£1440	0	0
Chairs, 30 tons, at £7	210	0	0
Fish Plates, bolts, &c.	100	0	0
Keys, spikes, felts, &c.	50	0	0
Sleepers, 1300, at 5s., say	330	0	0
Laying, at 2s.	130	0	0
Ballasting, say 4000 yards, at 2s. 6d.	500	0	0
Fencing, equal to 1¼ mile, per mile run	150	0	0
Per mile	£3000	0	0

No. 2.—Rolling Stock.

2 Locomotives, complete. (Hawthorn & Co.'s pattern engine and tender in one, at £1700)	£3000	4	0
7 Passenger carriages, at £400	2800	0	0
2 Break vans, at £300	600	0	0
30 Truck, various, average £150	4500	0	0
Tools, duplicates, &c.	1000	0	0
	£12,300	0	0

ESTIMATE—*Continued.*

No. 3.—STATIONS.

At Invercargill—			
Earthwork and facing	£1000 0 0		
Booking office and Manager's house	1000 0 0		
Passenger platform	200 0 0		
Carriage and passenger shed	800 0 0		
Raised platform and way for delivering stone	500 0 0		
Engine shed and repairing shop, with siding	1000 0 0		
Coke platform, turn-table, water-tank, &c.	400 0 0		
Cranes and weigh-bridge	400 0 0		
Fencing and gates	200 0 0		
	£5500 0 0		
At Campbelltown—			
Booking office, with residence for Porter	£500 0 0		
Passenger platform and shed	400 0 0		
Engine shed, coke platform, water-tank, &c.	600 0 0		
Goods' warehouse	400 0 0		
Crane and weigh-bridge	300 0 0		
Turn table, &c.	200 0 0		
	£2400 0 0		
At Mokomoko —			
Booking office, with residence for porter, &c., &c.	400 0 0		
		£8300	0 0

No. 4.—WORKING EXPENSES FOR ONE YEAR.

Manager		£500	0 0
Three Clerks, at £250		750	0 0
Four Porters		600	0 0
Four Policemen		600	0 0
Repairs of permanent way.			
Say 18 miles, at £50		900	0 0
Buildings, &c.		200	0 0
Two Locomotives in Steam, at £1500		3000	0 0
Wear and tear of Rolling Stock, &c.		1500	0 0
		£8050	0 0

GENERAL ESTIMATE.

PERMANENT WAY—				
Invercargill to Campbelltown ... 15 miles, 5 chains.				
Branch to Horse Shoe Channel ... 1 mile, 15 chains.				
16¼ miles at £3000			£48,750	0 0
SIDINGS—				
Equal to one mile of permanent way, at			3000	0 0
EARTHWORKS—				
Invercargill to Mokomoko ... ... 114,847 yards.				
Branch to Horse Shoe Channel... ... 11,000 ,,				
125,847 ,, at 2s., £12,585 0 0				
Mokomoko Hill and Inlet ... ... 42,000 ,, at 3s., 6,300 0 0				
Shore of Bluff Harbour, for railway 67,000 ,,				
For highway ... ... 45,817 ,,				
112,817 ,, at 2s., 11,282 0 0				
			£30,167	0 0

GENERAL ESTIMATE—*Continued.*

BRIDGES—		
Wairaki Stream ...	£50 0 0	
Waimatua ...	250 0 0	
Mokotua ...	250 0 0	
Mokomoko ...	300 0 0	
		850 0 0
CULVERTS AND OUTFALL DRAINS—		
54 Culverts, at £30, and sundry Open Drains ...		2000 0 0
STONE PITCHING AT FOOT OF EMBANKMENT—		
2800 square yards, at 15s. ...		2100 0 0
Stations, as per estimate ...		8300 0 0
Rolling Stock, as per estimate ..		12300 0 0
Engineering, 2½ per cent ...		2500 0 0
Land Compensation and Law ...		
		£109,967 0 0
Deduct Earthworks, &c., for Highway, say ...		5000 0 0
		£104,967 0 0

REPORT OF J. F. DUNDAS ESQ., C.E. ON THE INVERCARGILL AND CAMPBELLTOWN RAILWAY.

Invercargill, 23rd February, 1863.

SIR,

IN compliance with your desire, I have now the honour to report that along with Mr. Heale, the Provincial Surveyor, I examined on 26th and 27th ult., the course of the proposed Invercargill and Campbelltown Railway.

Since then I have had repeated interviews with him, and have, along with him, gone over the plans, sections, and estimates.

It will be quite unnecessary for me to enter upon any minute description of the course of the line or proposed works, as these will, no doubt, be described in detail by Mr. Heale.

The country, as is very apparent, affords unusual facilities for the construction of a railway of superior curves and gradients at a moderate cost.

Considerable care and judgment have been necessary in the selection of the ground; not only to the northward of the Mokomoko Range, but also in the portion along the margin of the Bluff Harbour. All of this has been done with great judgment by Mr Heale, and I am quite satisfied that the best ground has been chosen.

The works are of an unusually light character, and there is an almost entire exemption from that formidable source of expenditure to railway companies—the necessity for frequent crossings by means of bridges over or under the railway; in the present case there being only necessary, on account of either public or private interests, a single crossing in the whole length of the line.

Material for ballast, and timber for sleepers, are in abundance on the ground; and, altogether, it has not hitherto fallen to my experience to see a line of the same length which could be constructed under such favourable circumstances.

The only points in connection with the works appearing to require special mention are—the crossing of the peat lands to the northward of the Mokomoko Range; the rock cuttings and steep gradients at that point; and the embankments at the margins of the small bays in the Bluff Harbour.

With regard to the first of these no difficulty need be apprehended; the main precautions will be—after proceeding, as proposed by Mr. Heale, to dig the ground and lay fascines—to avoid, wherever practicable, breaking the surface, and keep the embankments sufficiently high to provide for shrinkage.

It is proposed temporarily, at the outset, to cross the Mokomoko range by means of ascending and descending gradients of 1 in 58. This course may perhaps be financially expedient, but the traffic will for the time be materially inconvenienced, and I think should the Provincial Government feel in a position to cope with it at once, the advantage of materially reducing these gradients is very obvious. Practically, unless sidings are put in on both sides of the summit, the effect will be to limit an engine train to about one-fifth part of the load it could take along the rest of the line. Were the probable traffic steady and moderate in amount, this would be less objectionable, but, as in the case of a ship discharging or taking in cargo, when the occasional conveyance of considerable quantities in a limited time is necessary, the inconvenience and expense of working would materially tell.

No doubt, by putting in sidings and dividing the trains, the evil may be somewhat diminished, but still the inconvenience of stopping the way, and the delay and expense of shifting about the waggons between two points a considerable distance apart would be considerable.

Nor need, in my opinion, the lowering of these gradients necessarily cause delay in the completion of the line for traffic,—the material as excavated may be stacked by the

sides of the line and sent northward for road metal or other purposes when the railway is opened.

With regard to the embankments along the margin of the Bluff Harbour, the method proposed by Mr Heale, of constructing these with flat slopes and facing with stone is quite proper.

It is, however, I think exceedingly desirable that observations should be made of the highest tides which occur there, in order that the height of these embankments may be arranged upon definite information, and it would probably be well that the highest spring tide marks of next month should be ascertained and referred to the datum of the railway section. I am aware that the highest tides occur in the harbour with westerly winds, when the embankments will of course be in smooth water; but I am of opinion, notwithstanding, that it would be no more than prudent to take the highest ascertained tide under any direction of wind, and keep the tops of these embankments at such a height above it as to be beyond all question beyond the possibility of disturbance.

The structure and gauge of the permanent way are matters which will require early consideration. As the rail will be of the first class in point of curves and gradients, I am of opinion that the permanent way should be of the most substantial construction. The tendency of all the railway companies in the home country has been to increase the strength of their roads. No doubt it may be said their rate of speed is high and their loads and engines heavy; but looking only to the economy of repair in a country like this where labour is dear, I entertain no doubt that a way of transverse sleepers with a rail of 75 lbs to the yard should be adopted.

It must be kept in view, that most of the sources of outlay are constant, whether a 75lb. rail be chosen or one ten or fifteen pounds lighter, and that the adoption of the heavier rail would secure the greatest economy of repair, while the road would be fit for the carriage of the heaviest railway loads, at any railway speed. Keeping in view the rapid increase of population, and growth of commerce in operation in the Province, this is a point on which I think there should not be the slightest hesitation.

I am of opinion that the views of Mr. Heale with regard to the propriety of adopting the standing guage of 4 feet 8½ inches, are perfectly sound. It is amply sufficient for all purposes of traffic, and as the rolling stock must be obtained from England, the adoption of any other gauge would necessitate the making of special articles of rolling plant which could only be obtained at a large increase of cost.

The station ground at the Invercargill terminus, is considerably deficient in point of length; inconvenience will speedily, as the traffic increases, be felt from this cause.

I understand, however, that any extent of space can be had on the west side of the line, which would only require to be moderately embanked. It would be better that the engine shed, water-tank and engine turntable, should be kept some distance out of the station ground proper, on the west side of the line. This would materially increase the standing room within the station.

Taking the quantities of work as ascercertained by Mr. Heale, I consider his estimate quite sufficient for the execution of the works.

A third locomotive engine, should, if possible, be obtained at the outset. In other respects Mr. Heale's estimate for rolling stock is ample for a commencement.

I have the honour to be,

SIR,

Your Honor's most obedient Servant,

J. F. DUNDAS.

To His Honor
The Superintendent,
Southland.

Printed for the Provincial Government by SMALLFIELD & BAIN, Dee-street, Invercargill, Southland, N.Z.