

COMPARISON OF ROUTES.

As compared with former investigations, the general results of last year's surveys are—that the Cannibal Gorge route is found to be somewhat more difficult than was expected, and the Lake Lyndon one much more difficult; that the Hurunui route is somewhat easier; and the Amuri and Arthur Pass routes very much easier than the previous information led us to expect.

One of the most important considerations in selecting a route for a railway between the East and West Coast is the distance to travel between the principal centres. The following statement enables a comparison to be readily made:—

Table of Distances.

From	By Lewis Pass.		By Hurunui Pass.		By Arthur's Pass.		By Arthur's Pass.		By Amuri Pass.	
	Cannibal Gorge Route.		Hurunui Route.		Waimakariri Gorge Route.		Lake Lyndon Route.		Arnold Route.	
	M.	c.	M.	c.	M.	c.	M.	c.	M.	c.
Brunnerton to Christchurch ...	210	56	154	18	138	22	160	30	172	72
Brunnerton to Rolleston ...	221	72	165	34	124	18	146	26	184	08
Reefton to Christchurch ...	171	26	190	68	174	72	197	00	209	42
Reefton to Rolleston ...	182	42	202	04	160	68	182	76	220	58

The distances by the Amuri Pass from Reefton to Christchurch and Rolleston would be shortened eight miles if the line were taken by Nelson Creek instead of the Arnold; but the latter is the easier route.

Distances are given in the table to Rolleston as well as to Christchurch, because it is the collecting and distributing point for the traffic on the lines that come in south of Christchurch, and a correct comparison cannot be made without giving the distance by all the routes to this place.

The above statement shows that, in the matter of distance between the principal centres, Arthur's Pass route has greatly the advantage; the only exception is between Christchurch and Reefton; and even there the difference in favour of the Cannibal Gorge route is only about three and a half miles.

In my report of 1879 I pointed out the importance of shortening the distance from the West Coast to the populous districts south of Christchurch, and with this object suggested the construction of a direct line from the Arthur's Pass route, near Sheffield, to the main trunk line at the north bank of the Rakaia. This would still further reduce the distance to the southern districts by that route, the amount of the saving being fully twenty miles. This point, and the general superiority of the Arthur's Pass route in respect to length, are more clearly brought out by the following statement:—

				Miles.
From Rakaia to Brunnerton by Cannibal Gorge ...	...	...	...	243
From Rakaia to Brunnerton by Arthur's Pass ...	...	...	...	125
Balance in favour of Arthur's Pass	...	...	...	<u>118</u>
From Rakaia to Reefton by Cannibal Gorge ...	...	...	...	203
From Rakaia to Reefton by Arthur's Pass ...	...	...	...	162
Balance in favour of Arthur's Pass	...	...	...	<u>41</u>

So far as the districts north of Christchurch are concerned, the line just opened between Oxford and Malvern brings them within easy access of the Arthur's Pass route, the distance from Sheffield to Ashley *via* Oxford being somewhat less than that to Christchurch, *via* Rolleston.

Another strong argument in favour of the Arthur's Pass route is, that it comes nearer Hokitika and other places south of the Grey than either the Amuri or Cannibal Gorge lines.

The other more important points of comparison between the rival routes are shown by the following table:—

Route.				Length to make.	Estimated Cost.	Greatest Altitude.	Length of Main-range Tunnel.	
				Miles.	£	Feet.	M.	c.
Cannibal Gorge	...	...	...	142	1,875,000	2,550	2	15½
Hurunui Pass	...	...	...	101	1,408,000	2,360	3	35½
Arthur's Pass	...	...	...	95	1,505,000	2,530	3	16½
Lake Lyndon	...	...	...	126	1,994,000	2,700	3	16½
Amuri Pass (figures approximate)	...	...	...	104	1,300,000	2,400	3	0

In the above statement, and otherwise throughout this report, Brunnerton is taken as the western terminus of the proposed railway. If, however, we assume that the connection of Reefton with the East Coast is a condition, the cost of the two lines that come most into competition will stand thus: