

78. What I wish to know is, why you have abandoned that line: is it on account of engineering difficulties?—It was one that was felt not to be suited to the circumstances of the case, or one by which the country would be opened up, seeing that it was a coast-line.

79. The gentlemen named in the list of witnesses [produced] are those to whom we shall have to apply for detailed information as to the nature of this country?—Yes.

80. Are there any other witnesses you can think of?—I think you have got a full list.

81. *Mr. Fergus.*] I would like to ask Mr. Blackett whether he considers that an aneroid survey of the western route is sufficient on which to base an estimate—as careful an estimate as from a detailed survey?—You cannot make quite such a good estimate on the aneroid survey, but our experience has been that you can nevertheless make very good estimates from them.

82. You think an aneroid survey is quite sufficient to justify any one in selecting or condemning a route?—Perfectly so. An aneroid survey is perfectly trustworthy in that respect.

83. I suppose you have not taken into consideration all the engineering works on the Stratford line as accurately as you have on that which has been actually plotted?—The engineer that I employed on that work is a practical man, and his report I can take with confidence. He has given a very good report indeed in regard to the engineering difficulties. I was ordered by the Minister to have a survey made and levels taken of the Stratford line, but it has not been done, partly on account of bad weather. The men were on the point of starting when this Committee was instituted, so I have stopped them going into the country for the present.

84. I also wish to ask Mr. Blackett, from his investigations, if the general character of the works on the Marton-Te Awamutu line will be worse than those on the Stratford line, or *vice versa*?—The works on the central route are of a very favourable character.

85. For what reason?—I have not had time to look over the detail plans, as they only came in on Saturday morning, and they are very numerous; but I have the general longitudinal sections and report, and from these I judge that the works are of a most favourable character. The small number of large works on the line is really extraordinary, considering its length.

86. I notice, from this map, from Marton the line follows up almost exclusively the river valley?—Yes, nearly parallel with the Rangitikei River.

87. The country to the westward of this part of the line is unfavourable for railway purposes. There are no great engineering difficulties along the whole length of the line to Te Awamutu?—There are only four bridges of any consequence on the whole length of the Marton line, and the combined cost of these would probably not be more than £30,000.

88. Then, on the Stratford line, would there be more bridges, and of a greater expenditure?—I am not prepared to say that. The plans and reports show the nature of the works, the heaviest of which would apparently consist of tunnels.

89. There is another question I wish to put: What is the greatest height the railway reaches on these respective routes—Marton and Stratford?—The greatest height on the Marton line is about 2,600ft., and on the Stratford line 1,130ft.; but on the latter there are several summits of varying height, which are shown on the longitudinal section. If, as I understand, you wish to know the amount of the total rises and falls on each line, I have prepared a list of these. Taking Marton as the starting point for each, on the central line we find the total rises to be 4,911ft., and the falls 5,221ft.; on the Stratford line, starting from the same point, the total rises are 5,521ft., and the falls 5,831ft. This makes a difference of 610ft. more rise and fall on the Stratford line than on the Marton line. The total length from Wellington to Auckland by the western route is 464 miles; by the central route, 430 miles; and by the eastern route, 470 miles. On the eastern route you would have to make 170 miles of new railway; on the central route, 212 miles; and on the Stratford route, 142 miles.

90. *The Chairman.*] Can you give us the Engineer's estimate?—Not now; Mr. Rochfort is at work this morning finishing it; but we have estimates of the other routes in the report.

91. *Mr. Fergus.*] There is another question I should like to ask. There is some engineering formula whereby a certain distance on the flat is estimated as equal to so much on the rise?—It is variously estimated by different engineers. You are asking that, I suppose, *apropos* of what I stated as to the rises and fall on the respective lines.

92. Yes?—Well, allowing 25ft. rise for every mile in length, it gives an equivalent of twenty-four miles of extra haulage for a rise of 610ft.

93. *Mr. Larnach.*] I understood you to say that the central line was levelled from end to end?—Yes, it has been levelled, and we have the results in the office now.

94. Do I infer from that, that the late Government were favourable to that line? No, not necessarily. It was considered that, as we had the aneroid survey completed, and the Natives were favourable to our going through, we had better secure a levelled survey without loss of time.

95. It appears that more consideration must have been given to that line than any other by the late Government?—There has been, as it happens.

96. Therefore, that line was favoured most?—In that way; but I should not like you to draw any conclusion from that.

97. I understand from you that an aneroid survey might be called a flying survey?—It was not very "flying," as the country was difficult to traverse and covered with bush, and much wet weather was experienced, which made the progress slow.

98. An aneroid survey could be taken on horseback?—Not through such a country.

99. A great deal of it?—If you have open country, Yes; but this was not the case on the greater part of this line.

100. But, as a matter of fact, if the nature of the country permitted it, you could do so?—You could not ride over the line on a horse.

101. How closely can you take the altitude by an aneroid survey?—I think I can give you a very good example of what can be done by an aneroid survey. To explore the central route, Mr. Rochfort travelled over two hundred and forty miles, and when he had reduced his aneroid observations (taken during many months) over that length there was a difference of only 16ft.