

grades, not exceeding 45 feet to the mile, could be obtained with a considerable increase of distance, to admit of the necessary distribution of grade, the formation of the Country over which the line must pass being of such a nature as to leave to the Engineer no other recourse than either to go round the hill or cut thro' it, in the one instance, judging from the data, increasing the distance not much short of 2½ Miles, and in the other, admitting the gradients of 60 feet per mile, and encountering very costly earthwork. The Profile submitted by the Deputation, contains on its face the evidence of the facts here stated.

Both parties appear to have started at the Province Line from the same point, Mr. Sill by increasing the cuttings for the purpose of obtaining a lower level, reaches Davis Summit with an elevation of 16 feet less than that by Mr. Vinning's Survey, the distance to this point, on both routes, being about the same; but the work on the proposed line is very considerably increased. From this point, Mr. Sill appears to have left Mr. Vining's line, and proceeds on a new ground to reach the most objectionable points on the route, viz., Lifford's Gulf, Negro River, and a Gulf at Hatley Creek.

The Profile of that portion of the survey shows grades not exceeding 45 feet to the mile; but this is obtained by increasing the distance ¼ths of a mile and making the work so difficult and expensive that another reconnaissance was considered necessary by Mr. Gilbert, the Engineer employed by the Deputation, for the purpose of finding a line by which the extent of work shown on the Profile should be reduced.

A Profile of this portion of the improved route was also submitted. On examining this Profile, the point of deviation from the main line is easily established; but in its descent the line last run is not made to connect with the main line but stops 40 feet above it; showing most conclusively that no other means exist of overcoming the difficulty than by distributing the grades over a greater distance, or encountering enormously expensive work.

The line surveyed by Mr. Sill, fraught with all the difficulties of very expensive earth work, reaches the Hatley Gulf with an elevation of 11 feet above that of Mr. Vining, carrying, in my opinion, still farther evidence of the necessity of increasing the distance for the purpose of reducing the grades. At this point Mr. Sill's survey ends, while on the remaining portion of Mr. Vining's survey, there are still to be overcome 27,600 feet of grades exceeding 45 feet per mile.

From the character of the survey submitted, which bears on its face sufficient evidence that, to overcome the height, recourse is had to increase of distance.

I do not hesitate in assuming a data on which to base my calculation as to the total increase of distance that will be necessary to decide on a practicable route, with grades not exceeding 45 feet to the Mile.

In the first place, the distance between the Province Line and Hatley Gulf is already increased by 3,300 feet, as appears in the Profile submitted; add to this a distance required to overcome the additional 40 feet of height which is made, in attempting to avoid the heavy work at Lifford's Gulf, equal to 4,693 feet of 45 feet grade; and add to this a distance necessary to overcome the 11 feet being the difference of height between Mr. Sill's and Mr. Vining's survey, which is equal to 1,070 feet of the same grade. It would make the total increase of distance to overcome the grades on the first 14 Miles from the Province, 9063 feet. In making this calculation, however, the data are too imperfect for a positive statement of distance, but a considerable increase must certainly be made, and very heavy additional work encountered.