

Canadian Pacific Railway Survey.

In the last *Year Book* there were published some interesting facts respecting the Preliminary Surveys of the Pacific Railway, to which we refer the reader.

We have further interesting information in a Report of Progress of Mr. Sandford Fleming, the Chief Engineer, to January, 1874. The following is a summary of the conclusions in this Report, which will be seen are highly favourable for this great Railway project:—

"1. That, although the information respecting the Rocky Mountain Zone is not yet sufficiently complete to establish the line to the Pacific, several routes have, however, been found, on which the obstacles met with, although formidable, are not insuperable.

"2. That there are reasonable grounds for the belief that the explorations in progress in British Columbia will result in the discovery of a line through the Rocky Mountain Region, which, taking every thing into consideration, will be more eligible than any yet surveyed.

"3. That it is now established beyond doubt, that a favourable and comparatively easy route, considering the line as a whole, has been found from Ottawa to the northerly side of Lake Superior. This result is the more satisfactory, as unfavourable impressions had been created regarding this portion of the country, many having considered it even impracticable for railway construction.

"4. That it will be possible to locate the line direct from the northerly side of Lake Superior to the Prairie Region, without unusually expensive works of construction, at the same time with remarkable light gradients in the direction of heavy traffic.

"5. That the main line from Ottawa to Manitoba can be located in such a way as to render unnecessary the construction of a branch, to reach the navigable waters of Lake Superior.

"6. That there will be no difficulty in finding a comparatively easy route across the Prairie Region; that the bridging of the large river, with proper care in location, will form no large proportion of the cost of the whole extent of the railway.

"7. That the lakes and rivers of the Prairie Region may be advantageously used in the introduction of settlers and in the construction of the railway.

"8. That, with respect to operating the railway in winter, the chief difficulties will be found on the western slopes of the two great mountain chains in British Columbia, but, except in these localities, the Canadian Pacific Railway will have, on an average, considerably less snow than existing railways have to contend with.

"9. That the practicability of establishing Railway communication across the Continent, wholly within the limits of the Dominion, is no longer a matter of doubt. It may indeed be now accepted as a certainty that a route has been found, generally possessing favourable engineering features, with the exception of a short section approaching the Pacific coast; which route, taking its entire length, including the exceptional section alluded to, will on the average, show lighter work and will require

less costly structures, than have been necessary on many of the Railways now in operation in the Dominion."

With respect to paragraph No. 8 (that is the question of climatic difficulties) of the preceding summary very important facts have been brought to light by this survey. Parties have been in the field during winter in nearly every portion of this territory. Throughout the whole of the Woodland Region the depth of snow is generally less on an average by 20 or 30 per cent than in the city of Ottawa; and from Lake Nepigon to Manitoba the snow ranges from 70 to less than 50 p.c. of the depth at Ottawa. Throughout the whole of the Prairie Region the snow rarely exceeds 20 or 24 inches in depth, and frequently not half so much over wide areas. In the Mountain Region the snow fall is more varied. On the western slopes of the Mountains which are affected by the influence of the prevailing winds from the Pacific, laden with vapour, there is greater snow fall in winter and rain fall in summer than on the Eastern slopes not affected by the same influence. One hundred horses and mules, much worn out with the work of the survey, were turned out and left to shift for themselves in the Jasper Valley. Not a single death occurred. They all resumed work in March following in fair condition. Jasper Valley is about 3,300 feet above the level of the sea, and 10 degrees of latitude further north than Toronto.

With respect to the engineering feature of gradients and elevation, we make the following extracts from the Report:—

"Commencing at the southeasterly angle of Lake Nipissing, the whole distance to Lake Ellen, on Nepigon River, is about 557 miles. The line at Lake Nipissing is about 730 feet, and at Lake Ellen, 604 feet, above sea level. Between these two extremities, the route passes over two main summits, one about 110 miles northwesterly from Lake Nipissing, at an elevation of 1420 feet above the sea, and the other about 70 miles easterly from the River Nepigon, elevated 1400 feet above the sea. Between these two summits, for a distance of over 370 miles, there is a long flat basin, characterized by no great inequalities. The line for this long distance, will be generally very level, the ground averaging from 1000 to 1200 feet above the sea; at one point only, River English, does it dip to 830 feet.

"The route, for nearly the whole distance east of Nepigon, runs behind the rugged and elevated belt of country which presents formidable obstacles on the immediate shores of Lake Superior. This rough district is crossed directly back of Lake Ellen where it is narrow and probably least forbidding. In consequence, about 25 or 30 miles of the line northeasterly from Nepigon river will show heavy work, while the remainder of the distance to Lake Nipissing, about 350 miles, will, it is believed, be comparatively light."

"In ascending westerly from Lake Nipissing, the rise to the highest point is less, and the length of line occupied in making the ascent considerably greater, than in passing from Lake Ontario to Lake Huron by railways in operation across the peninsula of Western Ontario.