

trail leading up the side of the river bank towards the south; so we turned in that night with the satisfaction that we were still to travel in the morning on dry land.

To the west of us, on the other side of the river, was a level partially wooded country, a portion of the Tobacco Plains, which, as will be seen by reference to the plan, is a tract of country of about 10 miles in width, stretching from near Mount Sabine on the north to the southward of the boundary line, bounded on the west by low wooded hills, and skirting the foot of Galton's Range on the east. The Kootanie Fork in its southern course traverses these plains.

Being now at the western extremity of the Kootanie Pass, I will pause to point out the capabilities it affords for a railway across the mountains within the British possessions. I should premise that I have not sufficient evidence to be able to state that the Kootanie Pass is absolutely the most advantageous place for the crossing of a railroad from the Saskatchewan Plains to the Pacific, because the mountains to the north have not yet been sufficiently explored; but I am able to say that it is the most southern line within the British territory, and, as yet, by far the shortest; moreover, I have every reason to believe that the most suitable portion of the mountains for the passage of a railroad will be found to the south of Bow River.

The Kootanie Pass crosses the Rocky Mountains from the Great Saskatchewan Plains on the east, to the Tobacco Plains on the west, its extremity on the former side being 40 and on the latter 18 English miles to the northward of the international boundary, the 49th parallel of north latitude. Its length is 40 geographical or nearly 47 English miles, extending from longitude $114^{\circ} 34'$ to $115^{\circ} 24'$ west. It leaves the Saskatchewan Plains where they have an altitude of about 4,000 feet above the sea, rises 2,000 feet to the watershed of the mountains, descends to Flathead River, again to an altitude of 4,000, follows up this river to its head waters, then crosses a precipitous ridge, reaching an altitude of 6,000 feet; it then descends the great western slope, falling 2,000 feet in two miles of horizontal distance, after which, by a nearly uniform grade of 100 feet per geographical mile, it gains the Tobacco Plains at the point where the Wigwam branch enters Kootanie or Elk River.

By reference to Section No. 1, it will be seen that there are three obstacles to the passage of a railroad; namely, two mountains and one steep slope. As to the mountains, they could, I consider, without difficulty be pierced by tunnels. The great western slope is a more serious obstacle; however, in the following details I hope to show that it also may be overcome.

From the forks of Belly River on the east side the line would traverse the gradually ascending prairie to the entrance of the pass where Railway River issues from the mountains. This river would be followed up with a grade of 1 in 180, or 34 feet per geographical mile for $7\frac{1}{2}$ miles, the "river levels" affording considerable advantages; leaving this river it would follow the course of my track marked on the map. A cutting of about $3\frac{1}{2}$ miles would lead to a tunnel of nearly 5 miles in length, which would pierce the Watershed mountain, and come out in the valley of Flathead River, the whole having a grade of 1 in 130, or 47 feet per geographical mile. On emerging into the valley, the line would skirt the base of the mountains to the north of the track, thereby avoiding a steep descent, then following up the river with a grade of 40 feet per geographical mile, it would reach the rise of the western ridge at a height of 5,100 feet above the sea. This would be the culminating point of the line, from which in a distance of 10 geographical miles it has to fall 1,900 feet to the North and South Bluff, and after that, by a slope of 54 feet per geographical mile for five miles, to reach the Tobacco Plains, crossing the Kootanie Fork by a bridge. This I propose to accomplish in the following manner:—From the culminating point, to pierce the ridge by a tunnel of three geographical miles, and continue the line along the side of the hills to the north of the track until reaching the North Bluff, the whole with a grade of 190 feet per geographical mile. This portion of the line of ten geographical miles would have to be worked by a wire rope and one or more stationary engines. Regarding the remaining five miles to the west of the North and South Bluffs, a careful survey is required to determine whether a grade not too steep for locomotives can be made. My measurements, taken with so uncertain an instrument as an aneroid barometer, must not be depended on to a few feet; they give a fall of 54 feet per geographical mile, or 1 in 112.

As regards the country to the west of the Kootanie Fork I can say nothing, but that no mountains were visible to the distance I could see, neither have I any personal knowledge of the Saskatchewan Plains to the eastward of the forks of Belly River; but it is probable that these great prairies stretch without break from this point to the Red River Settlement, and that in the construction of a railroad little more labour would be required than that of laying down the rails. The following statement of distances to be traversed by a railroad to the Pacific within the British territories may be of interest:—

	Geogr. Miles.
Lake Superior to Red River Settlement	320
Red River Settlement, <i>via</i> Elbow of South Branch of Saskatchewan to Rocky Mountains	700
Kootanie Pass	40
West End of Kootanie Pass to Mouth of Fraser's River, Gulf of Georgia	300
Total, Lake Superior to Pacific	1,360

Probable length of railroad, 2,300 miles English.

Thus it will be seen that out of the whole distance one-half is over level prairies, and but 40 miles through mountains.