

but reconstruction of the track before the trains can be run.

In districts where snow wages its relentless warfare against human handiwork with seasonal regularity, the engineer practises the precept that "Prevention is better than cure." He makes no attempt to arrest the progress of the snow movements, but lets them go their way unimpeded, merely striving to divert them clear of the track, so as to expend their destructive energy harmlessly at some other place.

The Canadian Pacific Railway always has suffered severely from the buffet-

ings of the avalanche, or "snow-slide," as it is called locally. These assaults are experienced particularly in the mountains upon the 140 miles between Sicamous Junction and Golden.

The mountain section of this railway traverses five—*through* two, and *over* three—mountain ranges. Coming eastwards from the Pacific the line, following the Fraser and Thompson Rivers, passes through the Coast and Cascade Ranges at a comparatively low level. At no point does the train rise to an elevation exceeding 1,200 feet above the sea. In these ranges a very heavy rainfall, varying from 70 to 105 inches per annum, is encountered. On the other hand there is almost a total absence of snow.

Continuing eastwards the railway passes over three other ranges in rapid succession. These are respectively the Gold Range, the Selkirk Range, and the Main Range of the Rocky Mountains. As a matter of fact the two first named ramparts are subsidiaries of the great North American mountain system, but the Main Range of the Rockies is so-called in order to distinguish it from the others. In these three ranges the railway attains considerably higher elevations than upon any other part of the mountain section, the summits of the passes being respectively 1,900, 4,300, and 5,300 feet. Here the annual

snowfall is very heavy. On the railway the average fall is 25 feet in the Gold Range, 35 feet in the Selkirks, and from 14 to 15 feet in the Rockies. Thus it will be seen that the Selkirks receive the heaviest precipitation, and the 35 feet average often has been exceeded. The heaviest maximum snowfall recorded is 45 feet 7 inches, but there is an unconfirmed report that in one winter the fall reached 56 feet!

The reason why the snowfall is so heavy in the Gold and Selkirk ranges is because these are the first high mountains encountered by the moisture-saturated clouds which drift eastwards from the Pacific Ocean. These high ridges intercept the cloud movements, with the result that the moisture with which they are laden becomes precipitated—rain in summer and snow in winter. By the time the air currents have reached the Main Range of the Rocky Mountains they have been deprived of the greater part of their moisture, and thus, being comparatively dry, the snowfall on the last named range is much lighter, although the ridge is approximately 2,000 feet higher than the other ranges to the west.

Therefore it will be seen that, while there is a considerable volume of snow to be handled in both the main and its two subsidiary ranges lying immediately to the west, the snow-lighting efforts to keep the line clear have to be concentrated upon that section of the railway extending through the Selkirks, with the Gold Range as a good second.

During the very first winter, when the railway builders were toiling among the crags and precipices of the Selkirks, laying the bond of steel, the severity of the snow movements was driven home upon the Canadian Pacific Railway engineers very compellingly. The permanent way is practically side-hill excavation through the range. As the grade runs at right angles

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Snow in the Rockies.