

handcar experience will convince any engineer of the desirability of a straight and open track near stations, no matter how good the signal arrangements may be.

Snow removal will be a perennial source of expense to Canadian roads, and its accumulation should be prevented by location if possible. It is customary to elevate the grade two or more feet above fields and flats, in order that the rail may be always wind-swept. In cuts ample width should be provided, and the rail raised well above the bottom of the cut wherever the wind directions are such that serious drifts will be formed. In bush location the change of snow movement that will be caused by clearing should not be overlooked.

That satisfactory track is largely a question of thorough drainage has long been acknowledged, but the fact that the necessity for drainage is a matter of natural soil has not been as clearly recognized by the railroad engineer as by the common road builder. Cases occur where an inexpensive shift of the line would throw it upon a dry and open sub-soil, and alter the drainage conditions completely.

Every effort should be made to avoid road and railroad crossings, swing bridges, and lines along public streets, not only because of construction cost, but particularly to secure freedom of traffic movement. The power to locate such crossings of other lines of transportation has to be obtained from the Railway Committee of the Privy Council. This is rather unfortunate, as that body has a decidedly political complexion, and a railroad, no matter how carefully built, may have its line ruined by a level crossing forced upon it by government authority. It is difficult to suggest an improvement upon our present method, unless it be by the creation of a non-political commission; and for the present it would seem that the road which has consistently avoided the building of level crossings itself is in the strongest position to fight any applications for permission to cross its lines.

The necessity of securing a good foundation for the roadbed is a point that should not be overlooked, as that detail affects both construction and operation. Every soft spot should be thoroughly tested before the location is finally laid down, and if any great depth of weak material is discovered, the line should be changed so as to avoid it. The writer knows of at least one serious sink-hole over which the original location and construction was carried without any investigation. Bad foundation is not only a construc-