

FIG. 2.—CRIB WHARFING ON THE METAPEDIA.

and numerous culverts, large enough to carry off extraordinary floods as well as the usual flow of water. To prevent the impeding of the line by snow, the track must be raised somewhat above the surrounding surface, and the cuttings should be wide enough to admit of the snow being cast aside by snow ploughs. Miles and miles of snow fences and snow sheds are also found necessary for this purpose. In passing through forest land, a sufficient width has to be cleared to prevent obstruction of the road by falling trees and to reduce the risk of injury by bush fires—the latter, in the resinous pine woods, being a dangerous contingency.

No portion of a railway is more important than its bridges. These structures in a rough or mountainous region are often of considerable magnitude, and, on account of spring freshets and ice shoves, have to be of more than ordinary strength. The bridges must be of most substantial character, and generally all of iron. Steel rails are far preferable to even much heavier ones of iron. They last much longer, and the cost of shipping,

transport, handling, and track-laying is no more. Such rails, therefore, are now exclusively employed. The building of stations, "engine-stables," water-tanks, and workshops for the accommodation and repair of rolling stock, is also an important item of railway construction.

The "superstructure" of a railway consists of ballast, ties or sleepers, rails, and everything above the formation level. The weakest part of a line of rails is the joints between them. To secure the greatest possible rigidity under the strain of passing trains, what are called "scabbard joints" are often employed, as well as the ordinary "fish-plate." The scabbard is a sort of splint of good steel, sheathing the ends of the rails, and firmly bolted and spiked in place. The sleepers are generally of spruce, pine, tamarac, or cedar, about two feet six inches from centre to centre. The best ballast is clean gravel, without any admixture of loam or clay, which would hold the water.

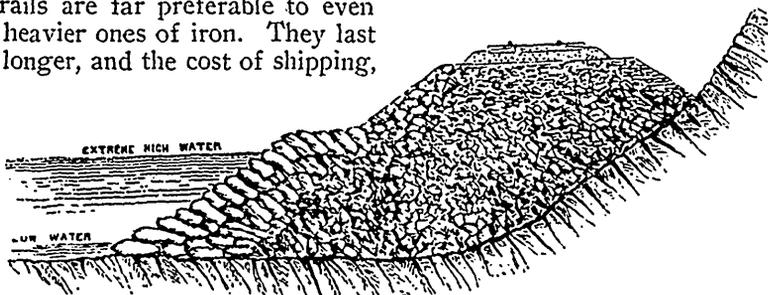


FIG. 3.—EMBANKMENT ON THE METAPEDIA.