not very easy to now change the location of them. The question to be considered is how to make on these lines the best road under the circumstances. Economy of motive power must be carefully considered and also cost of construction. These two in most cases will be antagonistic to each other and the merits of each will have to be weighed and decided upon by the person in charge of the work. Sir John McNeill asserts, that "if a road has no greater inclinations than one in forty there is twenty per cent. less cost for maintenance than where the inclination of the road is one in twenty. The additional cost is due not only to the greater injury by the action of the horses' feet on the steeper gradient, but also to the greater fatigue of the road by the more frequent necessity for sledging or breaking the wheels in descent." John Maclennan for some years president of the Association of Road Surveyors for Scotland says, "Gradients should not exceed one in forty. Easy gradients are preferable to dead levels, securing drier and more compact roads."

Foundations.

The stability and permanence of any structure depends upon its foundation, so it is with roads. A poor foundation will soon make a poor surface; the best material may be used but it will soon get into holes, ruts and depressions if the foundation is bad. One of the main essentials for a good road foundation is thorough drainage both surface and subsoil. It is quite impracticable to construct successfully a good road with any kind of material on a soil that is filled with water having no outlet Therefore, the first thing to be done in making a road after the grade is established, is to remove the water from beneath the roadbed and afford an easy means of its escape from the surface. It is necessary to consider the kind and nature of soil that the road is to be built upon before making provisions for its drainage. Different classes of soil will require different treatment, but in every case it is necessary to thoroughly dry the soil by drainage before proceeding further with the work. Gravels and sands are easily dealt with, as they do not hold water in suspension, but clays and most other soils are more difficult, and it requires care and good judgment in most cases to decide on the best means of removing the subsoil water. If the soil is porous and will not hold the water in suspension, then side drains will be sufficient, but if the soil is retentive or springy, then it is necessary that underdrains should be placed along the road, with cut off drains leading to the side ditches at short intervals. Underdrains are best constructed of field tile three or four inches in diameter, and should be at least two and one-half feet deep from the surface. Sometimes one drain along the centre of the road will be sufficient, but two drains are better, one on each side of the finished roadbed.