

This is, however, independent of lowering hills, building bridges, or large culverts, or cutting extensive lateral drains, the cost of which, when necessary, must be added.

The cost of lowering hills will depend upon their elevation, nature of the soil, whether rock or otherwise; the cost of bridges on the width of the streams, and the nature of the foundation, proximity of materials, &c. Taking 20 miles together in Upper Canada, probably £200 per mile may be a fair estimate for lowering hills and building bridges; this is, however, necessarily vague, and altogether dependant upon circumstances.

A great deal of money has been wasted in pursuing a straight line over hills, a better as well as a cheaper road can be generally made by skirting a hill.

It is no farther round the side of an orange than over the top of it.

A very mistaken practice has prevailed in Canada in the method of repairing macadamized roads.

It has frequently happened that before an experienced Engineer has completed his work, or probably when he has made a mile or two only, his services are dispensed with, and his place occupied by some one whose services can be obtained at a cheaper rate, (and not unfrequently by one of his foremen,) who is altogether ignorant of the first principles of road making, and wholly destitute of experience, or of the necessary practical or scientific knowledge requisite for either making or repairing roads.

The consequence is, that from want of proper attention the road is allowed to become rutty, and from the unequal settlement of the metal there are many hollow places, which if not properly managed, or injudiciously repaired, produce a loss of reputation to the Engineer,

whilst the public sustain the double inconvenience of having to travel on a bad road, and of encountering the heavy expense of heaping on a quantity of new material, which raises the road too high in the middle, and at a cost twenty times greater than the charge of occasional inspection by a competent and experienced Engineer.

The labour of one man will keep in repair three miles of well made and well drained Macadamized road for the first two years after its formation, and four miles for the two years after that. By constantly raking the loose stones into inequalities in the road, and by also raking into the middle from the sides those which have been forced up by the constant pressure of heavy weights in the centre, scraping off the mud, opening water courses, &c.

During the fifth year the road may require to be "lifted," that is (technically) picking up with a sharp well-steeled pick-axe about two inches in depth of the solid metal bed, and spreading it very evenly over the entire surface. This will cost about 9d. per running yard.—The lower parts of the bed having become a solid mass, equally hard throughout, if this operation be well performed, the road will be better than ever it has been, perfectly free from inequalities on its surface, and will bid defiance to any weather or to any loads which may be drawn upon it, without fresh materials, for at least two years longer; when, if the metal-bed from its wear has become thin, a covering of two inches of new material may be laid on.

The first mile of macadamized road made in Upper Canada, namely, that on Yonge Street, near Toronto, was constructed in 1832. No repair whatever was done to it for seven years, and then a very slight one only,—and probably no single mile of macadamized road has been more severely tried. Allowing for the natural compression of the material, it has not now in 1841, lost two inches of its original substance.

*The following is a calculation of the cost of an ordinary mile of road, without taking into account lowering hills, building bridges, engineering, compensation for land, toll-gates, &c.*

330 Toise of Stone delivered on the side of the road at £2 .....	£600
Breaking 330 toise at 50s. per toise.....	495
Forming, ditching, draining, &c.....	400

---

£1555