

(Copy.)

No. 220 West 57th Street, New York,

July 26th, 1900.

Mr. H. N. Ruttan,

City Engineer of Winnipeg.

Dear Sir,—

Your esteemed favor of the 16th inst., with enclosure and bag of macadam samples, is at hand. The stones have been examined physically and the specifications read.

I take the liberty to so extend the permission given to make suggestions as to the specifications, that they cover the whole subject. The limestone costs but about 42 per cent. of the trap or hornblendic shale, and there would be a saving of about 33 per cent. in the cost of compacting it; on the other hand, it is not tough, and is smooth—that is, it will neither wear long nor bind well, and the dust from it will be acrid, injuring goods in shops and furniture of houses, if it is laid in business and residence streets. This last mentioned objection, however, does not apply with much force to country roads, where limestone dust of this quality merely troubles travellers.

As the value of a road increases somewhat with the $1\frac{4}{10}$ power of its length, and very slightly with its depth, so it is thick enough not to break through, how would it do as a temporary measure to try the first layer, 7 and 5 inches, for a year or so? The trouble from dust may be ameliorated as hereafter proposed, and you could pave more than twice as much street for the same appropriation. If you have a heavy clay soil and are fearful of the effects of frost, let me advise you strongly to first lay down 3 or 4 inches of fine sand, dust from the stone breaker, old plastering, or any other material that will keep the clay from working up through it to lubricate the stones. All understand that the top surface of a macadam road should be a roof, but it is not so generally conceded that in some soils a roof on the underside against wet clay is fully as necessary.

Limestone dust can be kept down, and without injuring the road, by adding clay and fine gravel after the stones are thoroughly compacted and the interstices filled. Between one-eighth and one-quarter of an inch when compacted of