Again, if we take very small streams, those for which under any circumstances, a a clear waterway of 2 ft. 6 in. square would be quite large enough, and make an estimate of the cost of a culvert of this size for different heights of embankment, and make a comparison with the cost of an open beam culvert for the same heights of embankment, we shall see the following very striking differences.

Height of Embankment.	Open Beam Culvert.	Box Culvert.
5 feet.	$430	$310
10 feet.	1,010	480
20 feet.	4,040	810
30 feet.	9,200	1,113
40 feet.	17,500	1,280

If these calculations are well founded, it will be obvious how important it is, before coming to any decision as to the size and character of a bridge or culvert to be adopted, at any given place, to be in possession of the information upon which alone such a decision could safely be based. If made too small the cost is entirely lost, and the re-construction more expensive than building it of the right dimensions in the first instance, while if built unnecessarily large, the loss is much greater than without accurate calculation could be supposed. An excess in either way is great want of economy and should be avoided if possible.

Although it may seem of little or no consequence to a non-professional man, what kind or character of structure is erected, the above will satisfy you, and I am glad the Commissioners have raised the question, that it is really a matter of very grave importance. You will readily perceive that the fullest possible information respecting what the circumstances of each case requires, should first be obtained before the character of the structure should be finally decided on, and until this is done, until what is wanted is known, no contract should be entered into, except one on the principle of the schedule system.

I have now made all the observations I consider necessary respecting the statements which the Commissioners were pleased to submit to the Government, in reply to my un-official letter to you, dated January 2nd last. I need scarcely say that my opinion remains unchanged with regard to the principle upon which the contracts should be based. There is one point however which I should allude to before closing this letter, and it is this : Tenders consisting simply of a schedule of prices and no more, would not on the face of them give any idea of the probable cost of the work to be done, and although I have shown how the relative value of tenders of this kind may be correctly ascertained, I admit that a considerable number of them would cause some delay in making the computations and comparisons. If this be an objection it could easily be removed by furnishing contractors with a statement of quantities made up roughly from the best data obtained, such as the approximate estimates in the possession of the Commissioners, and requiring each party tendering to money out these quantities each with his own prices, exactly as in England. This would transfer to the contractors the operation of calculating the amounts, which, under the first plan, would be done by the clerks in the Commissioners Office.

I would farther suggest, that although it is impossible with our present information, to prepare a statement of quantities with any pretensions to accuracy, every care should be taken that the quantities furnished contractors should be ample to cover every possible contingency, that they should in fact be *maximum quantities*.

If this were done, not only would the Commissioners on receipt of the tenders be able to judge of their relative value, but both them and the Government would know the *maximum liability incurred* by each contract. It would then be the duty of the Commissioners and the Engineer to take advantage of information gained by farther surveys and of every circumstance which would tend to reduce the quantities actually executed in the work without impairing its efficiency. The contract would provide for this as in the English contracts, and the contractor would be paid for all that he actually performed at his own prices, and for that only.