

left for the 800 feet of roadway ; thus reducing the cost per lineal foot to be about that of the tube. But in the application of a suspension bridge for the St. Lawrence, the item £15,000 for "Land-chains," would, of course, have to be added to the cost of the 7000 feet of roadway, which would swell the amount per foot to a little over that of the tubes.

In all that has been said respecting the comparative merits of the different systems of roadway, you will perceive that a *complete wooden structure* has not been attended to ; because, in the first place, when the design for the Victoria Bridge was at first being considered, *wood* was deemed not sufficiently permanent ; in the second place, the structures alluded to in the report as being inferior to that now in progress, are proposed to be constructed of stone and iron work ; and, as a third reason, the construction of the tubular roadway is already so far advanced, that any alteration, to the extent of abandoning *iron* and adopting *wood*, must involve monetary questions of so serious a nature as to render the subject beyond discussion, or even being thought of in this Report.

In conclusion, therefore, I have to state to you (my deliberate opinion) that the present design now being carried out for the Victoria Bridge is the most suitable that can be adopted, taking all the circumstances into consideration, to which the question relates. In making this statement, I must ask you to bear in mind that I am not addressing you as an advocate for a tubular bridge. I am very desirous of calling your especial attention to this fact ; for really much error prevails upon this point, through the impression that in every case I must appear as an advocate : no one is more aware than I am that such inflexible advocacy would amount to an absurdity.

I entirely concur in what Mr. Ross says respecting the propriety of applying the suspension principle to the passage across the Niagara Gorge ; no other system of bridge-building yet devised could cope with the large span of 800 feet which was there absolutely called for, irrespective of the other difficulties alluded to.

When such spans are demanded, no design of "beam" with which I am acquainted would be at all feasible. The tube, trellis, and triangular systems are all impracticable in a commercial sense, and even in a practical engineering question, the difficulties involved are all but insurmountable.

Over the St. Lawrence we are, fortunately, not compelled to adopt very large spans ; never so large, in fact, as have been already accomplished by the simple "girder" system. It is under these circumstances that the suspension principle fails, in my opinion, to possess any decided advantage in point of expense ; whilst it is certainly much inferior as regards stability for railway purposes.

The flexure of the Niagara Bridge, though really small, is sufficiently indicative of such a movement amongst the parts of the platform as cannot fail to augment, where *wood* is employed, before a long time elapses.

I beg that this observation may not be considered as being made in the tone of disparagement ;