not aware that any bridge, large or small, has been built on that system since that date. This must not be understood as condemning the system.

Paragraph 6. Out of three similar designs, 'A,' 'B' and 'C,' submitted by the St. Lawrence Bridge Company, design 'B,' which complies least with the specifications of the board, is recommended by my colleagues. I cannot see any reason for their choice except that it is the cheapest of the three.

My colleagues also state that this design offers features which simplify the erection and minimize the risk to both life and property.

This, of course, is an expression of opinion sustained by neither reasons nor facts. I can only submit the reasons which helped me to form a different opinion and which are as follows:

(a) The letters received from the engineers I had consulted and which are referred to above.

(b) The opinion of Mr. Phelps Johnson, as shown in page two of report No. 11 of the board, and in the minutes of the meeting held September 7, 1909:

'He saw no unusual difficulties in the erection of the design (board's design).'

(c) The schemes of erection proposed by the St. Lawrence Bridge Company are identical, both for the board's design and for their own design. I am, therefore, unable to understand why more men or property would be injured in the one case than in the other.

Blue prints (Appendix 'B') showing the different modes of erection proposed by all contractors and copy of a letter from the St. Lawrence Bridge Company dated October 15, 1910 (appendix 'C') explaining the different schemes of erection, are attached to this letter. (Note passages underlined by myself).

I would say, however, that I differ from the opinion re top travellers, expressed in that letter and believe they are at least not more dangerous than through travellers for the following reasons:

(a) Clauses 17 and 19 of the contract put the complete responsibility for damages to persons or property solely on the contractor. It is, therefore, to be presumed that all contractors have given this question their best consideration, from a business if not from a humanitarian point of view.

With this in view top travellers are adopted by the Germans in their own design, the British Empire Bridge Company and the Pennsylvania Steel Company, although the latter had lately used through travellers for the erection of an 1,182 feet cantilever span in connection with the Blackwell's Island bridge at New York. Their choice of top travellers for the Quebec bridge must, therefore, be the result of their experience in the erection of large cantilever bridges. Their engineer of erection is reputed to be one of the best in America.

(b) The latest large cantilever bridge, erected in America, at Beaver, Pa., was erected with top travellers and the engineer in charge told me their use had been very sucessful.

(c) Top travellers rest on the members of the trusses themselves, instead of on the bridge floor. As they are much smaller than the through travellers, offering less surface to the wind, and have a much wider base, they have consequently greater stability and the risks attending life and property are correspondingly less.

(d) Top travellers, which never are higher than through travellers, follow the top chord and come gradually lower as erection progresses and becomes more dangerous, whereas through travellers remain always at the same height and when they come near the end of the cantilever arm, offer a large surface to the wind and are apparently more dangerous for the men.

I think, however, in view of the guarantees exacted from the contractors by the terms of the contract, that the choice of the scheme of erection and the erection appliances should be left to the contractor, subject to the supervision of the board.

Paragraph 7. Temporary members will, of course, be numerous in any design for such a large structure. Three temporary heavy members in each truss or twelve altogether are required for the board's design.

They are similar to other members used heretofore for the erection of the suspended span of cantilever bridges.

All such temporary members are part of the falsework and their cost is included in the tenders.

Paragraph 8. The schemes of erection proposed by the St. Lawrence Bridge Company are identical, whether for their own design or for the board's design. If through travellers are used they are carried on the main members in either case. As all the panels of the board's design are similar, the operations are also similar. But as stated in paragraph 3, I am in favour of top travellers and cannot see, in a structure of this size, what difference it would make if the operations for each connection are different.

Paragraph 9. I fail to see the importance of this remark.

(a) because there are numerous members in the suspended span of design 'A,' 'B' and 'C' which do not carry live load. Why are they harmless in the suspended span and harmful in the cantilevers?

(b) There is a large number of members in both designs, namely, the materials and sway bracing which do not carry live load, and they have the same effect in preventing the free deformation of the trusses under live load.

(c) all trusses of large bridges such as the Thebes bridge and the projected cantilever bridge over the Hudson river have a large number of members which do not carry live load and I am unaware of any criticism having been levelled at them by any one on that account.

(d) Design 'C' of the St. Lawrence Bridge Company, which is the only one amongst 'A,' 'B,' and 'C' that comes within clause 74 of the specifications, has a large number of such members.

Designs 'M' and 'N' of the same company and guaranteed by them, contain such members, in excess of the number used in the board's design.

The design of the Germans has also a large number of such members.

None of the contractors have ever protested against such members in the board's design,