to the States of South America. It may not be long before some of them will be found in India, and I think that ere many years bridges of the American type will be manufactured and erected in England.

Let us see how first-class American railroad companies (and there are railroads in the United States that will compare favourably in every respect with the best in England) get their bridges built. First they employ the services of an acknowledged expert in bridge designing to prepare general specifications; then these are submitted to half a dozen of the principal bridge companies, who make tenders for the work. The contract is generally let to the lowest bidder who has furnished satisfactory diagrams of stresses and sections and drawings for each structure.

Then the company employs an expert inspector, who makes a specialty of this business, to remain in the shops, while the ironwork is being manufactured, during which time he makes numerous tests of small sample bars, and an occasional test, to rupture, of a full sized member, any material not coming up to the required standard being rejected. In many cases all the tension members are tested far beyond their working strength but within the elastic limit.

As an example of a grave error in a large modern railroad bridge of, I believe, English design and manufacture, let me call your attention to a letter from Professor Kernot, of the University of Melbourne, which appeared in *The Engineer* of June 5th. The structure referred to is the Hoogly Bridge of, I think, four hundred feet span; with curved upper chord. Professor Kernot points out, that by this curvature the intensity of stress in the end panel of the upper chord varies from zero on one side to twice the average on the other, thus making the bridge only half as strong as calculated. No American engineer of any standing would make such a mistake. That this style of bridge with the curved upper chord is not uncommon in Europe, can be seen by glancing over Mr. Edward Hutchinson’s treatise on “Girder-making.”

Next, in regard to the 150 feet span on the Yezo Railway. I have been told that it was purchased ready made from a Pittsburgh manufacturer, having been built for an American road and rejected because of bad workmanship and inferiority of design. I cannot vouch for this statement; my knowledge of the bridge being simply hearsay. If it be true, it is but one of the examples of how badly the Japanese Government has been treated by foreign manufacturers and business men.

The statement of your correspondent that Dr. Pole approved of the drawings for the present Japanese bridges is valueless when contrasted with the list of errors in design that I have given on pp. 5, 6, and 7. Grave faults are there clearly indicated; and, if your correspondent wishes to convince the public that the Japanese bridges are perfect, the onus of proof lies with him.

A parallel instance of technical authority was the condemnation of the great Forth Bridge by Sir George Airy, who is supposed to be posted in bridge building. He betrayed the grossest ignorance of some of the most simple matters in bridge designing, and showed himself a quarter of a century behind the age.

Your correspondent appears to lay stress upon the fact that “the bridges