cost down to what is really necessary for their purposes, leaving the extravagant excess to be provided for by posterity.

OF THE STIFFNESS OF THE BRIDGE.

It will hardly be doubted now, that the cables proposed for this bridge will possess ample strength to afford every reasonable assurance of their perfect safety. Nor will it be doubted, either, that such cables can be manufactured, since *they have been made* both of larger and smaller size. There is, in fact, no more difficulty in making and adjusting one of 5000 strands, than one of 500 strands.

But the fitness of the structure for the purposes in view does not rest solely on the strength of the supporting wire; for the bridge must not only be so strong that it shall not be broken down under the weight of the trains, but it must also be so firm that it will not be dangerously or injuriously bent under the engines which are to pass over it.

This division of the subject is fortunately susceptible of the same rigid analysis as that which has already been considered.

A suspended chain is flexible, and yields more or less to every weight that is applied to it; but it yields in accordance with certain laws, and the amount of its flexure may be calculated in ordinary cases with any necessary degree of precision.

These calculations are not speculative or conjectu-