equal to that stated may be looked for with certainty. It must be borne in mind also that wire just from the blocks is not so strong as when it has been made for a few months probably from the particles having time to rearrange themselves after the process of elongation. In one experiment on a long piece, it was found to be much tougher after remaining in the air coated with linseed oil varnish for about two months, than when first made although the piece in question was subjected all the while to a load equal to about one tenth of its ultimate cohesive strength and incessant vibrations.

If then a strand of wire of sixteen hundred and thirty feet long weighing less than eighty-four pounds, were hong vertically it would sustain its own weight and the difference between its ultimate cohesive force and the weight of the strand; that is if of average strength it would not break with less than its own weight and *fourteen hundred and twenty-pounds besides.* That is for N°. 10 wire.

As then there are to be eighty thousand strands of wire in the cables they will unitedly sustain eighty thousand times as much as one strand; or the ultimate strength of the cables will be equal to 120,000,000 lbs. or 60,000 tons net.

As however in their positions as catinaries, the cables will not sustain as much, as though being vertically, owing to the direction in which the forces come which act upon them an allowance has to be accordingly made. The rules by which this is governed, are as well known as other mathematical facts, and the result can be arrived at with precision, the formulae however is some what complex and for that reason is not here introduced. Those who wish to investigate it more fully are refered to appendix A, where the condition are mathematically stated.

In the case before us and depending upon the angle given to the tangent of curvature, the strain upon the cables will