of strength, corresponds to a tension of 1300 pounds per single wire, measuring twenty feet per pound, or to 90,000 pounds, per square inch of section. The contractors, submitted a number of skeins for testing, which were all accepted. They then secured sufficient stock of the same quality of iron, to fill the whole order, and were thus enabled to insure a uniform quality throughout. On delivery, the tests were continued with the same favorable results. From a great number of tests, which varied but slightly, I found the average deflection, at which rupture took place, to be 0.683 feet, or a little over eight inches. The wire measures 18.31 feet per pound, and the above strength, therefore, is equivalent to 1640 pounds per single wire, or nearly 100,000 pounds per square inch. By this mode of testing, the wire is sure to give way at the weakest point. The above result, therefore, shows a remarkable uniformity in the iron, and great care in the manufacture of the wire.

Assuming the above average strength, the aggregate strength of the 14,560 wires composing the four cables, will be 23,878,400 pounds. But their actual strength is greater, because the above calculations are based upon a minimum strength of the individual wires.—The weak points of the different skeins, will not happen to meet all at the same point. Being closely, and very compactly bound together, they will greatly assist each other, and I am, therefore safe in estimating the strength of the cables beyond the result of the above calculation. We may assume their aggregate ultimate strength at 12,000 tons, of 2,000 pounds each.

Next to severe strains, repeated vibrations and con-