

land Legislature has lately been passed permitting the consolidation of the two companies, whenever they shall see it for their mutual interest: and an act is also now being obtained from the Imperial Parliament for the special incorporation of the Atlantic Telegraph Company, and providing, among other things, for the increase of its capital to one million pounds sterling, with a view to future more extended operations.

With these prefatory observations on the origin and past history of the undertaking, I will now refer more particularly to the heads of inquiry addressed to me.

FIRST. FORM AND STRUCTURE OF THE CABLE.

No particular connected with this great project has been the subject of so much comment through the press as the form and structure of the telegraph cable; but knowing the interested motives with which the writers of several of these communications have put forth their peculiar views, I deem it unnecessary to enter into any special controversy with them on this subject. It may be well believed that the directors have not decided upon a matter so all-important to success, without availing themselves of the most eminent talent and experience which could be commanded. The practical history of submarine telegraphs dates from the successful submersion of the cable between Dover and Calais in 1851, and advantage has been taken of whatever instruction this history could furnish or suggest.

Of the submarine cables heretofore laid down, without enumerating others, it may be interesting to mention that the one between Dover and Calais weighs six tons to the mile; that between Spezzia and Corsica, eight tons to the mile; the wire laid from Varna to Balaclava, and used during the late war, less than three hundred weight to the mile; while the weight of the cable decided on for the Atlantic telegraph is between nineteen hundred weight and one ton to the mile. This cable, to use the words of Dr. Whitehouse, "is the result of many months of thought, experiment and trial. Hundreds of specimens have been made, comprising every variety of form, size, and structure, and most severely tested as to their powers and capabilities: and the result has been the adoption of this, which we know to possess all the properties required, and these in a far higher degree than any cable that has yet been laid. Its flexibility is such as to make it as manageable as a small line; and its strength such that it will bear, in water, over six miles of its own weight suspended vertically." The conducting medium consists not of one single straight copper wire, but of seven wires of copper of the best quality, twisted around each other spirally, and capable of undergoing great tension without injury. This conductor is then enveloped in three separate coverings of gutta percha of the best quality, forming the core of the cable, round which tarred hemp is wrapped, and over this the outside covering, consisting of eighteen strands of the best quality of iron wire; each strand composed of seven distinct wires, twisted spirally in the most approved manner by machinery adapted to the purpose. The attempt to insulate more than one conducting wire or medium would not only have increased the chances of failure of all of them, but would have necessitated the adoption of a proportionably heavier and more cumbrous cable. The tensile power of the outer or wire covering of the cable being very much less than that of the conductor