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ntic Teleted more a battery connected ter quanconvected · with the able, concircuit of und to be ant, somee inserted to, cell by he battery resistance. l not make enough to rating, and the amount of force given out was always proportionate to the dynamic quantity flowing through the instruments. Intensity was only the medium which forced through this dynamic quantity.

The three following conclusions, which had been introduced into previous discussions, were then referred to :-- 1st, That a submarine circuit was a Leyden jar, which had to be charged to saturation, before passing a signal through; and consequently, the smaller it was, the sooner it was charged, therefore following a different law to that of a suspended wire, which probably followed the law of squares ;-2nd, That the rapidity of signalling with voltaic currents was not affected by the intensity of the battery ;--and 3rd, That magneto-electric currents travelled more rapidly than voltaic ones, and also increased in rapidity when their intensity was increased. The Author, in differing from these conclusions, did not wish it to be understood, that he thought the law of squares applied to submarine wires; for he knew of no electrical phenomenon which obeyed this law. It was submitted, that there was a material difference between a Leyden jar and a submarine circuit. In a Leyden jar the inner and outer coatings were perfectly insulated from each other. If they were not insulated, there could be no statical charge; induction, therefore, involved insulation. The fact was frequently overlooked, that the only real insulation in a submarine circuit, was the resistance opposed by the wire to the passage of the current, for it united both, being in contact with the earth at both ends. If it offered no resistance, there would be no insulation, and, consequently, no induction; and in proportion to the resistance it offered, providing always the insulating medium was of the same thickness, would induction be manifested. In the case of a suspended wire, the insulating medium of the air took the place of the guttapercha of a submarine cable. The earth, the nearest conductor, being a long way off, and only on one side, no large amount of induction could take place between the earth and the wire; nevertheless it did take place to a certain appreciable extent. Indications of it had been noticed in a circuit 60 miles long, and it was believed that it could be perceived in much shorter circuits with delicate If the wire was brought nearer to the earth, induction apparatus.