would be developed more strongly, and it might be brought down, step by step, until the condition of a submarine wire was approached, where the earth surrounded the wire on all sides, and was only separated from it by the three-sixteenths of an inch of gutta-percha, a substance possessing specifically a very much greater inductive capacity than air.

It was mentioned, that a wire of a given length offered the same resistance to a given quantity of electricity, that a wire of double the length did to half he dynamic amount. From this it was deduced, that all wires offered an infinitely small resistance to an infinitely small amount of electricity. The action of a battery when connected to send a current along a submarine wire was then considered, and it was remarked, that the wire and the earth being only separated by the thin layer of gutta-percha, induction could readily take place. Whilst the wire itself opposed great resistance to the quantity of electricity the battery was capable of generating, the effect would be to form a wave throughout the wire; but as there was but little resistance, comparatively speaking, to induction taking place, the greater portion of the first impetus would be occupied in charging the wire statically near the battery end. very minute amount would begin immediately to flow at the further extremity, and in proportion as the tension of the wave of charge rose throughout the wire, so would the flow increase, both reaching their maximum together. When the wire was disconnected from the battery, this current would continue to flow out in a decreasing stream, as the tension of the wave of charge lowered, both ceasing at the same time. In the case of a wire, it was asserted, wire, it was asserted, that as no induction worth naming could take place, there could be no accumulation of statical charge worth noticing; the whole impetus was therefore directed forward, and not diverted laterally, consequently, signals were found, for all practical purposes, to pass instantly. In the case of a submarine wire, the time elapsing between the contact of the battery and the appearance of the current, would be dependent on the sensitiveness of the instruments to record small amounts of electricity.

The relative amount of induction was decreased, when the wire

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