

or less, and at some actually stands at right angles to it. This remarkable phenomenon, which is called the variation of the needle, and which was discovered by Sebastian Cabot in the year 1500, is accompanied with another called the dip, noticed by Robert Norman in 1576. It consists in a tendency of a needle, nicely balanced on its centre, when unmagnetized, to *dip* or point downwards when rendered magnetic, towards a point below the horizon, and situated within the earth. By tracing the variation and dip over the whole surface of the globe, it has been found that these phenomena take place as they would do if the earth itself were a great magnet, having its poles deeply situated below the surface,—and, what is very remarkable, possessing a slow motion within it, in consequence of which neither the variation nor dip remains constantly the same at the same place. The laws of this motion are at present unknown; but the discovery of electro-magnetism, by rendering it almost certain that the earth's magnetism is merely an effect of the continual circulation of great quantities of electricity round it, in a direction generally corresponding with that of its rotation, have dissipated the greater part of the mystery which hung over these phenomena; since a variety of causes, both geological and others, may be imagined which may produce considerable deviations in the intensity, and partial ones in the direction, of such electric currents. The unequal distribution of land and sea in the two hemispheres, by affecting the operation of the sun's heat in producing evaporation from the latter, which is probably one of the great sources of terrestrial electricity, may easily be conceived to modify the general tendency of such currents, and to produce irregularities in them, which may render a satisfactory account of whatever still appears anomalous in the phenomena of terrestrial magnetism. This branch of science thus becomes connected, on a great scale, with that of meteorology, one of the most complicated and difficult, but at the same time interesting, subjects of physical research; one, however, which has of late begun to be studied with a diligence which promises the