

thither in an imperceptible time ; and by means of well-devised systems of operation, is made to convey from man to man words, which are now most emphatically "winged words." In the most civilized states such wires now form a net-work across the land, which is familiar to our thoughts as the highway is to our feet ; and wide seas have such pathways of human thought buried deep in their waves from shore to shore. Again, by using the chemical effects of electrodynamic action, of which we shall have to speak in the next Book, a new means has been obtained of copying, with an exactness unattainable before, any forms which art or nature has produced, and of covering them with a surface of metal. The *Electrotype Process* is now one of the great powers which manufacturing art employs.

But these discoveries have also been employed in explaining natural phenomena, the causes of which had before been altogether inscrutable. This is the case with regard to the diurnal variation of the magnetic needle ; a fact which as to its existence is universal in all places, and which yet is so curiously diverse in its course at different places. Dr. Faraday has shown that some of the most remarkable of these diversities, and probably all, seem to be accounted for by the different magnetic effects of air at different temperatures : although, as I have already said, [Book xii.) the discovery of a decennial period in the diurnal changes of magnetic declination shows that any explanation of those changes which refers them to causes existing in the atmosphere must be very incomplete.¹⁵

¹⁵ *Researches*, Art. 2892.