

piece of amber when rubbed. Such results are altogether different from the universal attraction which, according to Newton's discovery, prevails among all particles of matter, and to which cosmical phenomena are owing. But yet the difference of these special attractions, and of cosmical attraction, was at first so far from being recognized, that the only way in which men could be led to conceive or assent to an action of one body upon another at a distance, in cosmical cases, was by likening it to magnetic attraction, as we have seen in the history of Physical Astronomy. And we shall, in the first part of our account, not dwell much upon the peculiar conditions under which bodies are magnetic or electric, since these conditions are not readily reducible to mechanical laws; but, taking the magnetic or electric character for granted, we shall trace its effects.

The habit of considering magnetic action as the type or general case of attractive and repulsive agency, explains the early writers having spoken of Electricity as a kind of Magnetism. Thus Gilbert, in his book *De Magnete* (1600), has a chapter,¹ *De coitione Magnitica, primumque de Succini attractione, sive verius corporum ad Succinum applicatione*. The manner in which he speaks, shows us how mysterious the fact of attraction then appeared; so that, as he says, "the magnet and amber were called in aid by philosophers as illustrations, when our sense is in the dark in abstruse inquiries, and when our reason can go no further. Gilbert speaks of these phenomena like a genuine inductive philosopher, reproving² those who before him had "stuffed the booksellers' shops by copying from one another extravagant stories concerning the attraction of magnets and amber, without giving any reason from experiment." He himself makes some important steps in the subject. He distinguishes magnetic from *electric* forces,³ and is the inventor of the latter name, derived from *ἤλεκτρον*, *electron*, amber. He observes rightly, that the electric force attracts all light bodies, while the magnetic force attracts iron only; and he devises a satisfactory apparatus by which this is shown. He gives⁴ a considerable list of bodies which possess the electric property; "Not only amber and agate attract small bodies, as some think, but diamond, sapphire, carbuncle, opal, amethyst, Bristol gem, beryl, crystal, glass, glass of antimony, spar of various kinds, sulphur, mastic, sealing-wax," and other substances which he mentions. Even his speculations on the general laws of these phenomena, though vague and erroneous, as

¹ Lib. ii. cap. 2.

² *De Magnete*, p. 48.

³ *Ib.* p. 52. ⁴ *Ib.* p. 48.