

BOOK XII.

MAGNETISM.

Recent Progress of Terrestrial Magnetism.

IN Chapter II., I have noticed the history of Terrestrial Magnetism ; Hansteen's map published in 1819 ; the discovery of "magnetic storms" about 1825 ; the chain of associated magnetic observations, suggested by M. de Humboldt, and promoted by the British Association and the Royal Society ; the demand for the continuation of these till 1848 ; the magnetic observations made in several voyages ; the magnetic surveys of various countries. And I have spoken also of Gauss's theory of Terrestrial Magnetism, and his directions and requirements concerning the observations to be made. I may add a few words with regard to the more recent progress of the subject.

The magnetic observations made over large portions of the Earth's surface by various persons, and on the Ocean by British officers, have been transmitted to Woolwich, where they have been employed by General Sabine in constructing magnetic maps of the Earth for the year 1840.¹ Following the course of inquiry described in the part of the history referred to, these maps exhibit the declination, inclination, and intensity of the magnetic force at every point of the earth's surface. The curves which mark equal amounts of each of these three elements (the *lines of equal declination, inclination, and force* :—the *isogonal*, the *isoclinal*, and the *isodynamic* lines,) are, in their general form, complex and irregular ; and it has been made a matter of question (the facts being agreed upon) whether it be more proper to say that they indicate four poles, as Halley and as Hansteen said, or only two poles, as Gauss asserts. The matter appears to become more clear if we draw magnetic *meridians* ; that is, lines obtained by following the directions, or pointings, of the magnetic needle to the north or to

¹ These maps are published in Mr. Keith Johnstone's *Physical Atlas*.