

observations with instruments especially designed for magnetic work as to employ instruments the results from which need a continual careful inspection. The observation data must be of such a degree of precision that the phenomena revealed by them can be accepted as having a physical existence, and therefore not to be ascribed to errors of observation. Data only fairly accurate may completely hide the very phenomena to be studied.

#### HISTORICAL SUMMARY OF MAGNETIC SURVEYS.

The first complete magnetic survey in which the three magnetic elements—declination, dip and intensity—were determined, and which was executed as a national piece of work and was co-extensive with the limits of the country surveyed, was that of the British Islands, corresponding to the epoch of January 1, 1837. This survey was undertaken in 1836 at the request of the *British Association for the Advancement of Science* and was completed in 1838. The example set by Great Britain was speedily followed by the execution of similar surveys in various portions of the globe—in Austria, Bavaria, Germany, Holland, Belgium, France, Canada, etc. At the present time nearly every civilized country has been surveyed magnetically to a greater or less extent.

But such surveys must be repeated after the lapse of a number of years on account of the slow, yet appreciable, change forever going on with regard to the earth's magnetic state, which change, as one of the most noted physicists has truly said, is a warning "that we must not suppose that the inner history of our planet is ended." Thus after the lapse of twenty years Great Britain—again at the instance of the *British Association for the Advancement of Science*<sup>1</sup>—repeated its original magnetic survey.<sup>2</sup> The observations were taken between

<sup>1</sup> Doubtless no national organization has done so much for the advancement of the subject of terrestrial magnetism as this most distinguished body of scientific men. Money grants have been freely made; committees on magnetics composed of the most eminent physicists have been formed from time to time, and co-operation has been extended and encouragement given to magnetic enterprises in many ways.

<sup>2</sup> Report on the Repetition of the Magnetic Survey of England by Major-General Edward Sabine. Report of the *British Association for the Advancement of Science* for 1861.