

part of Russia, has now a western declination, while at the close of the seventeenth century the needle first pointed due north, in London in 1657, and in Paris in 1669, there being thus a difference of twelve years, notwithstanding the small distance between these two places. In Eastern Russia, to the east of the mouth of the Volga, of Saratow, Nischni-Nowgorod, and Archangel, the easterly declination of Asia is advancing toward us. Two admirable observers, Hansteen and Adolphus Erman, have made us acquainted with the remarkable double curvature of the lines of declination in the vast region of Northern Asia; these being concave toward the pole between Obdorsk, on the Oby, and Turuchansk, and convex between the Lake of Baikal and the Gulf of Ochotsk. In this portion of the earth, in northern Asia, between the mountains of Werchojansk, Jakutsk, and the northern Korea, the isogonic lines form a remarkable closed system. This oval configuration* recurs regularly, and over a great extent of the South Sea, almost as far as the meridian of Pitcairn and the group of the Marquesas Islands, between 20° north and 45°

From Gilbert's *Physiologia Nova de Magnete*, we see plainly (and the fact is very remarkable) that in 1600 the declination was still null in the region of the Azores, just as it had been in the time of Columbus (lib. 4, cap. 1). I believe that in my *Examen Critique* (t. iii., p. 54) I have proved from documents that the celebrated line of demarkation by which Pope Alexander VI. divided the Western hemisphere between Portugal and Spain was not drawn through the most western point of the Azores, because Columbus wished to convert a physical into a political division. He attached great importance to the zone (raya) "in which the compass shows no variation, where air and ocean, the latter covered with pastures of sea-weed, exhibit a peculiar constitution, where cooling winds begin to blow, and where [as erroneous observations of the polar star led him to imagine] the form (sphericity) of the Earth is no longer the same."

* To determine whether the two oval systems of isogonic lines, so singularly included each within itself, will continue to advance for centuries in the same inclosed form, or will unfold and expand themselves, is a question of the highest interest in the problem of the physical causes of terrestrial magnetism. In the Eastern Asiatic nodes the declination increases from without inward, while in the node or oval system of the South Sea the opposite holds good; in fact, at the present time, in the whole South Sea to the east of the meridian of Kamtschatka, there is no line where the declination is null, or, indeed, in which it is less than 2° (Erman, in Pogg., *Annal.*, bd. xxxi., § 129). Yet Cornelius Schouten, on Easter Sunday, 1616, appears to have found the declination null somewhere to the southeast of Nukahiva, in 15° south lat. and 132° west long., and consequently in the middle of the present closed isogonal system. (Hansteen, *Magnet. der Erde*, 1819, § 28.) It must not be forgotten, in the midst of all these considerations, that we can only follow the direction of the magnetic lines in their progress as they are projected upon the surface of the Earth.