between 1111 and 1117, that the mode of measuring the amount of western declination had long been understood. The merit due to Columbus is not to have made the first observation of the existence of magnetic variation, since we find, for example, that this is set down on the chart of Andrea Bianco in 1436, but that he was the first who remarked, on the 13th of September, 1492, that "$2\frac{1}{2}°$ east of the island of Corvo the magnetic variation changed and passed from N.E. to N.W."

This discovery of a *magnetic line without variation* marks a memorable epoch in nautical astronomy. It was celebrated with just praise by Oviedo, Las Casas, and Herrera. We can not assume, with Livio Sanuto, that this discovery is due to the celebrated navigator, Sebastian Cabot, without entirely losing sight of the fact that Cabot's first voyage, made at the expense of some merchants of Bristol, and distinguished for its success in reaching the continent of America, was not accomplished until five years after the first expedition of Columbus. The great Spanish navigator has not only the merit of having discovered a region in the Atlantic Ocean where at that period the magnetic meridian coincided with the geographical, but also that of having made the ingenious observation that magnetic variation might likewise serve to determine the ship's place with respect to longitude. In the journal of the second voyage (April, 1496) we find that the admiral actually determined his position by the observed declination. The difficulties were, it is true, at that period still unknown, which oppose this method of determining longitude, especially where the magnetic lines of declination are so much curved as to follow the parallels of latitude for considerable distances, in stead of coinciding with the direction of the meridian. Mag-

on terrestrial magnetism, William Gilbert, who can not be supposed to have had the slightest knowledge of Chinese literature, should regard the mariner's compass as a Chinese invention, which had been brought to Europe by Marco Polo. "Illa quidem pyxide nihil unquam humanis excogitatum artibus humano generi profuisse magis, constat. Scientia nauticæ pyxidulæ traducta videtur in Italiam per Paulum Venetum, qui circa annum mcclx. apud Chinas artem pyxidis didicit." (*Gulielmi Gilberti Colcestrensis, Medici Londinensis de Magnete Physiologia nova*, Lond., 1600, p. 4.) The idea of the introduction of the compass by Marco Polo, whose travels occurred in the interval between 1271 and 1295, and who therefore returned to Italy after the mariner's compass had been mentioned as a long-known instrument by Guyot de Provins in his poem, as well as by Jacques de Vitry and Dante, is not supported by any evidence. Before Marco Polo set out on his travels in the middle of the thirteenth century, Catalans and Basques already made use of the compass. (See Raymond Lully, in the Treatise *De Contemplatione*, written in 1272.)