SOME EARLY CONTRIBUTIONS TO THE HISTORY OF GEO-MAGNETISM—IV

BY H. D. HARRADON

Georg Hartmann—On March 4, 1544, Georg Hartmann, Vicar of the St. Sebaldus at Nuremberg, addressed a letter to Duke Albrecht of Prussia in which he announced his discovery of the magnetic inclination and the first determination of the magnetic declination on land. We reproduce here (page 129) Hellmann’s facsimile of the first page of the original of the letter which is in the Kgl. Staatsarchiv in Königsburg. This letter has been printed several times; first by J. Voigt in Raumers Historisches Taschenbuch, II (1831), then by H. W. Dove in Repertorium der Physik, II (1838), and later again by J. Voigt, together with other letters by Georg Hartmann in ‘‘Briefwechsel der berühmtesten Gelehrten des Zeitalters der Reformation mit Herzog Albrecht von Preussen’’ (Königsburg, 1841).

Since this important letter lay buried and unnoticed in the archives at Königsburg until the year 1831, it could not of course have exerted any influence previously on the science of geomagnetism. For this reason the discovery of the magnetic inclination is generally attributed to Robert Norman who first in 1576 determined the value of that element at London, as 71° 50’. One can hardly doubt from an examination of the text of Hartmann’s letter that he discovered the phenomenon of the inclination. That his determination proved to be exceptionally inaccurate—about 9° instead of about 65°—may be explained by the fact that his magnetic needle was suspended on a vertical and not a horizontal pivot and hence was impeded in its inclining movement.

The letter, moreover, contains the announcement of the earliest determination of the magnetic declination on land. It was made at Rome, probably about the year 1510.1

GEORG HARTMANN

(Reproduced from a medallion portrait, courtesy of the British Museum)
We are indebted to Hellmann for the greater part of the information given above. The translation of the letter which follows was kindly furnished by Prof. Sydney Chapman of London.

THE LETTER OF GEORG HARTMANN TO DUKE ALBRECHT OF PRUSSIA

Praise the Lord, 4 March 1544, Nuremberg.

Your Grace writes wishing to know the power and virtue of the magnet as I showed them to his Majesty at the last sitting of the Reichstag in Nuremberg. This virtue I would right gladly explain to your Grace, as far as can be done by writing, for such things are more easily shown by handling than by letter. But I will do my very best to show it to your Grace in writing.

And first then: Every magnet has in it this power and virtue, that one part draws iron to it, and the part at the opposite end of the magnet pushes and drives iron away. This is clearly shown if one takes a needle hanging on a thread, and holds a magnet to it. And the part that draws the needle to itself is the south part of the magnet; and if one strokes the forked end of a compass needle with that part, then this needle turns with the forked end not to the south, but to the north. This is a wonder of the magnet. Now if I hold the needle to the opposite part of the magnet, the magnet no longer draws the needle to it, but drives and blows it away; and this part of the magnet, that thus drives the needle away, is the north part, and if one strokes the forked end of the needle with it, the needle then turns not north but south. But the magnet-stone is still more wonderful in that the needle stroked by it does not point due north, but turns away from the true south-north line and points eastwards, in some countries by 6°, as I myself have found and studied, at the time in Rome, when his princely Grace, Margrave Gumprecht, and his brother were there together, but here in Nuremberg I find that this deviation is 10°, and in other places more or less. This is also always shown in compasses by a black mark under the glass, which mark, as one sees, always points not due north, but is away on the eastern side.

And secondly, I also find this about the magnet, that it not only turns from the north and deviates towards the east, by 9° more or less, as I have said, but also it dips downwards. This is now to be proved. I make a needle a finger's length, that stands level on a pointed rod, or level with a water-surface, so that it in no way inclines earthward, but both ends stand level in exact balance; but when I once stroke its ends, no matter which, then the needle no longer stands level, but dips downwards by 9° more or less. The cause why this happens I could not explain to His Majesty.

And thirdly, I have shown His Majesty how to find which part of the magnet is the south part, and which the north part. And thus I showed it to His Majesty. I had brought to me a large vessel full of water; and I had a fine small wooden bowl, that I set to swim in the middle of the water, and laid the magnet gently in the bowl. Now while I did not know which was the north part of the magnet, the bowl turns right

*Hellmann states that this observation, which was made in 1510 or thereabouts, is the first recorded measurement of the magnetic declination on land.