places deeper, in some shallower, in some places narrower, in some broader, but lies altogether, and is **perfect Lead**, only in the Outside, covered with reddish Earth.

To the Queries in the sixth Title, I cannot say much; it must be resolv'd by them, that melt the Lead-Ore, with which I have not been much acquainted, save only, that they beat the Ore small, then wash it clean in a running stream; then sift it in Iron-Rudders; then they make of Clay or Fire-stone a Hearth or Furnace, which they set in the ground, and upon it build their Fire, which is lighted with Char-coal, and continued with young Oaken-gadds, blown with Bellows by Men's treading on them; And after the Fire is lighted, and the fire-place hot, they throw their Lead-Ore upon the Wood, which melts down into the Furnace; and then with an Iron-Ladle they take it out, and upon sand cast it into what form they please.

So far this Account, which is hoped will be made in time more compleat, and succeeded with the like Answers from other places.

---

**An Extract**

Of a Letter, sent from Paris, about the Load-stone; where chiefly the suggestion of Gilbert touching the Circumvolution of a Globous Magnet, call'd Terrella, and the Variation of the Variation, is examined.

This Letter was written by the Intelligent and Experienced Monseur Petit, Intendant of the Fortifications of his Most Christian Majesty, to the Publisher, as follows;

I have received yours, wherein you desire to know my sentiment about the present Variation of the Needle, intimating withal, that an Artist in London affirms, that whereas heretofore the Declination was East-ward, 'tis now about one degree and a half to the West.

Nothing can be more welcome to me, than to have occasion given me to discourse of this Subject, especially to the Philosophers of England, whence the Philosophy of the Magnet...
had its rise; and whence also the Principal Observations of
the Change of its Declination are come to us, so that 'tis just
that the Observations, made elsewhere concerning the same,
should return thither, as to its source.

I shall therefore let you know, that having always been
Curious in the Doctrine of the Load-Stone, after I had made
the Experiments, that are in Gilbertus and others, I made
that of the Needles Declination on three different Meridian-
Lines, which I traced An. 1636, in several places of Paris,
and found, that the Needle declined 4° degr. North east
which having publish'd, and made known here to the Curious
and to Artists, some of whom counted 9 or 10 degrees accor-
ding to the Tradition and Writings of Orontius Fineus, and
Gascelfranc; others, 11 degrees, following Sennertus and Of-
fusis: all at first rejected my Observation; and as commonly
New things meet with obstacles and contradictions, before
they are established, those that could not contradict what they saw,
pretended, that this Variety did perhaps proceed from the
greater or lesser vigour in the Loadstones, employed to touch
with; or from thence, that the Needles had been touch'd near-
er to or farther from their Poles, which might make them
decline more or less from the Meridian, so as a Needle, be-
ing precisely toucht by the Pole of a good Magnet, might
perhaps have no Declination at all.

All which conjectures were not without their probability; which was the greater, in regard that all the Load-
stones I had seen, being rude and like Flints, with irregular
surfaces, in bunches and cavities, their Poles were al-
ways ill posited, and often within some of the Cavities,
so that one could not be sure to strike the Needle thro-
row the Pole of the Stone. To remove which difficulty,
and at the same time to find another quality (one of the ex-
cellentest of the World, if true,) viz. that which Gilbert
had assign'd to Terrella's; I resolv'd, to make the Experi-
ment of it. And because I have not yet written of it, nor any
man, I know, (Men having contented themselves with re-
futing this Error by Discourse only) you will perhaps not be
displeased to be inform'd of the success thereof.
You know, that Gilbert, though the first, that has writ rationally of the Magnet, and began to say no follies of it, writes about the end of his Book (yet without being positive) that if a Magnet altogether round were placed on a Meridian, and its Poles so posited, as to answer to the Poles of the World, and consequently its Axis to the Axis of the World, the Stone would continually of its self turn round in 24 hours. Whence he infers, that the whole Earth, as a great Magnet, turns also round about its Axis in the same space of time.

To explore the truth of this Proposition (which I wish were true; since then we should have a perpetual motion without wheels, and a Watch yet jufter than Pendulums) I found the means of causing two Magnets to be turn’d with the powder of Emery; the one whereof having been made Spherical with all possible exactness, became very solid, plain, and without any visible pores, or diversity of matter, being 1; inch in diameter: the other, bigger, of 2; inches diameter, but of less vigour, porous also and uneven; which made me lay it aside as useless for this Experiment, because, though it had been perfectly Spherical, as the lesser, I could not be assured, that its Center of Magnitude was the same with those of its Gravity, and Strength; which was requisite to make good Gilbert’s Proposition.

But for the other smaller Magnet, that had no defect, and its three Centers were the same, with so much justness, that after I had exactly found the two Poles of this Stone, I caused two small holes to be made therein, to support it by two points of Needles, as by two pivots: which having put in a Meridian of Braids, and suspended the Ball betwixt them like a little Globe, it was so easily moveable, that I made it turn every way with a blast only of my mouth, and it stopp’d indifferently, now in one, then in another place, not any side of it prevailing by its gravity, nor descending, as it would have done, if any of them had been heavier than another.

This Stone thus prepared without any defect in virtue or figure, uniforme, homogeneous, equilibrated, being adjusted on its Meridian and a Horizon, so placed on its Meridian-line, that the Poles thereof answer’d to the Poles of the Heavens (as hath been said already,); the success was, that it had not any Motion.
and a small white mark, I had made upon this Stone, remained still in the same place, where I had put it, without turning at all; whence I thought the Proposition of Gilbert sufficiently refuted.

This Stone, having serv'd me for this Experiment, did, together with the greater Stone, (whereof the Poles were also well marked) serve me also to find out, whether the Needles, touch'd in different places, nearer to, or further from the Poles, had different Declinations. Which having tryed frequently with these, and with other Stones, I found no difference at all in the Declination of the Needles.

And now to return to the main subject of the Letter, I then observ'd, that all these Needles declined then from the Meridian 4° degrees from the North Eastward. And, as I did not suspect, that this declination would have changed, having found it to be the same in many places, from Brest in Brittany to the Valois-line among the Alpes, I believed, the Antients had ill observ'd, and that the want of their exactness, in respect either of the Meridian-line, or the fabrick of their Needles, or the division of their Circles, was the cause of this defect. But I was soon undeceived of my own Error, when I learned a little while after, by Letters from England, that Mr. Burrows, Anno 1580, had near London observ'd the declination of the Needle to be 11°. degr. 11. min, as well as Oftusius and Sennertus: And that Anno 1612. Mr. Gunther, Professor of the Mathematicks, had in the same place found that Declination much diminisht, having then found but 6 degrees: And lastly, that Anno 1633. Mr. Gellibrand had found it but 4. degrees North-east, conformable to my Observations, Which did assure me, that those Declinations were not constant, but had varied.

And that I might be convinced by my self, I made from time to time Experiments in divers places, and found still more and more diminution; so that Anno 1660, in June, after I had very exactly traced a Meridian by many Azimuths, before and after noon, with a Brass-Quadrant of 6. foot diameter, and apply'd good Needles upon it, the one of 7. the other of 10. inches long, I found that they declined but one degree, or thereabout: And
the last year * I found no more but 10 minutes on the same Meridian. Upon which having lately applied, since the receipt of the Letter, the same two Needles, me thinks, the Declination is yet less, than the last year. But this I can assure you, that the Declination is yet some minutes towards the East, at least at Paris. So that you may, upon my word, doubt * of the Observation of your friend, whom perhaps the Meridian, or the Needle, or the Construction and Division of his Compass may have deceived, to a degree and a half North-west, which he at the present assigns to the Declination. But I doubt not, but in 12 or 15 years it will be found true what he affirms, as I have prognosticated by my Hypothesis, which makes the Declination to vary a degree every seven or eight years.

This is, what I had to return to the Letter, which I wish might deserve to be presented to your Illustrious Society, and contribute something to the discovery of so many admirable virtues lodged in this Stone, and principally to the finding out of the Cause of this Variation, for which I have already made some attempt, and proposed my thoughts in a Dissertation de Latitudine Paresenti & Magnetis Declinatione, which M. du Hamel caused to be printed Anno 1660, with his Astronomia Physica. I shall be very glad, to learn the sentiment of your Learned Philosophers thereupon, and what cause they suspect there is of so singular an effect. I could discourse to you of other particulars touching the Proprieties of the Lead-stone, and especially of a remarkable one, I have discover'd, and which, if I am not deceived, subverts that Theory, which undertakes to explicate all these effects by the Particula striata, but I reserve that for another occasion.