Thirdly, We met lately with a Body, which being opened, the Liquor, which is contain'd in the *Pericardium*, or the Bag of the Heart, was found congealed into a consistence fit to be cut with a Knife, and two square fingers thick about the Heart. I know not, whether this Observation be rare: But it is time to conclude with the assurance of my being, *&c.*

At *Montauban*,
Dec. 4. 1669.

AN OBSERVATION

of M. Adrian Azout, *a French Philosopher, made in* Rome *(where he now is) about the beginning of this Year* 1670. *concerning the Declination of the Magnet: Out of an Italian printed Paper, English'd by the Publisher, as follows.*

THe *Declination* of the *Load-stone* hath for many Years been observ'd not to continue alwayes the same in the same places; and the *Variation* to be such, that it can be no longer imputed to any defect in the Observations, as it was believed at first, when it was not very great: It hath been noted, some Years since, that the Magnetick Needle, which almost everywhere had declin'd *Eastward* to 8, 10, and 12 degrees (as may be seen in *P. Kircher*, and *P. Riccioli*) after its diminishing little by little as far as to the *Meridian*, began to decline *West-ward*.

M. *Adrian Auzout*, a great Searcher of the more considerable Effects of Nature, hath made here in *Rome* the following Observation about the Declination of the Load-stone, on many Meridian lines drawn as exactly as possibly he could (in a place, where he hath not all the conveniency for this performance) with a Needle, three quarters of a Palm * long; and on all the lines it was seen to decline somewhat more than *two* degrees *West-ward*, and on some, near *two* degrees and an *half*.

* *This is about six Inches.*

And that the Observation might be the surer, he drew parallel Lines in divers places, to see whether there were any Iron or Bricks near the Marble, on which he had described the Lines, that might have some influence upon the Needle;

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dle; but he alwayes found the ſame quantity of Declination Weſt-ward.

But by the Obſervations, here made formerly, it appears, that the Needle hath declin'd *Eaſt-ward* to 8 degrees, and hath afterwards been diminiſhing, until 'tis come to the other part, where we find it at preſent. The Obſervations, that may be made hereafter, will ſhew how far the Declination will advance towards the Weſt, and what will happen after its greateſt elongation; it not being probable, it ſhould encreaſe alwayes, and make a whole turn.

It ſeems not, that this difference of *ten* degrees and more can be attributed to the change of the Pole of the Earth, as ſome eſteem'd, perhaps before they knew it was ſo great; nor (as others would have it) to the Magnet, or to the Iron, that are found in certain places, becauſe there is but little Load-ſtone; and Mr. *Auzout* affirms, that the Mines, which he hath ſeen, make no impreſſion at all on the Needle. So that 'tis difficult to hit the true cauſe of ſuch a Variation: Yet however, if the direction of the Magnet, and of the Needle touched by it, depends from the flux of a certain matter, paſſing through the whole Earth, or the exterior parts of it, ſtrait along the *Axis*; it may be ſaid, that it proceeds from changes made in the ſaid flux, which, ſuppoſing the inequalities of the Earth, and the alterations continually made therein, as well artificial, by excavations and ſuch like other works, as Natural, by corroſions cauſed by fire and water, or by the generation of Metta's and Stones (beſides the various changes, we cannot think of by reaſon of the little knowledge we have of ſo vaſt a Body as the Earth) cannot but in progreſs of time change its ſcituation. To illuſtrate this with an Example taken from Rivers; They, although they were running ſtrait, cannot remain long without winding, and changing their courſe, if it happen, that the ground, over which they run, be unequal, or of a different nature. So 'tis probable, that the inequalities of the Earth may in time occaſion ſome bending in the current of this Magnetick matter, and make it change its bed and channel: Whence it comes to paſs, that the Needle changeth its direction according as the Current changeth, which directs it. And if you will conſider the variety of

motions,

motions, ſeen in Rivers becauſe of the higher or lower grounds, which are found in their Beds, and cauſe various windings and whirlings in them, poſſibly a reaſon may be rendred of the many differences, obſerv'd in the Declination of the Needle (*e. g.* why in ſome parts the Needle varies much in a little time; why, in others, it is alwayes turning without any ſtay, as ſome ſay they have obſerv'd; why the greater alterations are met with at the entring into, and going out of Iſlands?) and of many other things, we for brevities ſake paſs by; as we alſo omit to deduce from it divers particulars relating to Navigation.

Which if it ſhould be ſo, there would be no hopes of finding a regular Hypotheſis for that change, foraſmuch as it would depend from cauſes that have no regularity at all in them, as moſt of the mutations of Nature are. You may only take notice, that if there be a proportion between the force of the ſaid Current, and the Earth, *that* may be able by changing its Bed, remove *this* from its proper ſite: Which would produce an alteration in the height of the Pole, as ſome think they have obſerv'd, if *that* may not be aſcribed to a defect in the Obſervations, of which we may be rendred certain, when more exact ones ſhall have been made. And ſo, whereas others would impute the various Declination of the Magnet to the change of the Pole, we ſhould be obliged to attribute the change of the Pole to the various Declination of the Magnet.

From this Obſervation, which was thought fit to be publiſht here, Mathematicians are invited from time to time to make the like in their Countries, to ſee, whether in this change there be any regularity. If it had been obſerv'd every Year, we ſhould already know the progreſs thereof, and ſee, whether there were an Uniformity, and in what time the Needle did exactly reſpect the Pole. Wherefore it were very deſirable, that for the future, they would uſe greater care and diligence, in making moſt exact Meridians, as well for their own Obſervations, as for the conveniency of thoſe, who in their Travels ſhall have the curioſity of obſerving with the Needle it ſelf, as M. *Auzout* deſigned to do in the Cities where he paſs'd, if he had found Meridians there,

there, or ſuch as had been unſuſpected of the proximity of Iron.

It were well to obſerve, Whether the Declination, which almoſt through all *Europe* hath been *Eaſtward*, be now everywhere *Weſtward?* As alſo, Whether in *America*, where the Declination was almoſt every where *Weſtward*, it be increaſed or no proportionally; and ſo of other parts of the World? Noting withall the Year; which is not at all minded by ſome, who relate the Obſervations, without aſſigning the Year, in regard it will be very uſeful, to know the preſent Declination; and it might be put in Journals, for Navigation, and for the uſe of Magnetick Quadrants.

So far this Relation: In purſuance of which, Order hath been given by the Royal Society, *that preciſe* Meridians *be made in ſeveral places of* England; *for obſerving the preſent Declination of the Needle from them, here in* London, *and other Cities of this Kingdom: And that even thoſe* Meridians, *that were made very exactly many Years ago be examin'd by a careful deſcribing of new ones, to ſee whether they ſtill hold true, in regard of the ſuſpected alterations in Nature.*

If any ſhall inquire after the Manner *of finding the Variation of the Needle, he will find ſeveral wayes of doing it accurately, both by Sea and Land, in* Numb. 4. *of theſe Tracts; where alſo the great uſefulneſs of making exact Obſervations of this kind, is taken notice of, both for the diſcovery of the true Cauſe of the Magnet's* Verticity, *and for the finding the* Longitude *at Sea.*