

Maii 18. *P. M.*

Distantia Meridiana Solis a Vertice
30° 04'.

1 31 53 Limbus præcedens Veneris Meridian.
transit. Centro distant a Vertice
25° 57' 15".

Mercurium culminantem neque hac die
videre licuit, cœlo licet admodum
fereno.

N. B. Distantiæ a vertice a refractioni-
bus non purgantur.

Vide Fig. 2. in TAB.

XIII. *The Use of a new Azimuth Compass
for finding the Variation of the Compass
or Magnetic Needle at Sea, with greater
Ease and Exactness than by any ever yet
contriv'd for that Purpose; by Captain
Christopher Middleton, F. R. S.*

TO discover the Declination of the Magnetic
Needle, or Variation of the Compass at Sea,
with some tolerable Degree of Certainty and Exact-
ness, is a thing of great Use and Importance in the
Art of Navigation.

The Instruments and Methods hitherto used for
this Purpose, (as we could easily demonstrate, if it
were needful) are subject to several Inconveniencies, Er-
rors and Defects; to remedy which, this new *Azimuth
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Compass was contriv'd, and has by Experience been found effectual. It would be needless to give a Description to such as have the Instrument before them, and we shall therefore only shew the Manner of using it, and that as briefly as may be, which take as follows :

1st, The Instrument must be rectified, or fitted for Observation, by turning it about till the four Cardinal Points, that are hung upon the Centre-pin, agree with the four Cardinal Points on the Chart, at the Bottom of the Box : Then will the Needle, that shews the Magnetic Meridian, stand at no Degrees, and the East and West Points at 90 Degrees, on the graduated Circle within the Box; and in this Situation it must be kept, as near as may be, during the whole time of the Observation.

2^{dly}, Let the Index of the Quadrant be placed to that Degree of the Arch, on the Rim of the Box, which the Observer judges to be nearly equal to the Height of the Sun or Star whose *Azimuth* is sought; for by this means the Object will be more readily found.

3^{dly}, Turn the Quadrant round towards the Sun or Star, till it appear upon the vertical Hair within the Telescope, to an Eye looking through the small Hole or Sight; and then slide the Index a little upward or downward on the Arch, till the Object by this means be brought to coincide or touch the visible Horizon.

Lastly, The Degrees and Minutes then mark'd by the Index upon the Arch of the Quadrant, will shew the Altitude of the Object, which will always be the same, whether the Instrument is in Motion or at Rest; at the same time the Degree cut by the Index on the ho-

horizontal Rim or Circumference of the Compass-box, will give the magnetical *Azimuth* of the Sun or Star.

N. B. All this may be perform'd by one Person, whereas the old Compass requires several to manage it, which also makes it subject to many great Errors.

How the Variation of the Needle is found by means of Magnetical *Azimuth* and Altitude thus obtain'd, is taught in every Treatise of Navigation, and we have no need to repeat these Rules in this Place. But as the Resolution of this Problem is somewhat troublesome, and requires such a Knowledge of the Doctrine of the Sphere, as every Seaman has not attain'd, we shall here exhibit an easy Method of discovering the Variation of the Compass without any manner of Calculation, which cannot fail to render this Instrument still more acceptable: To this End,

1st, Let the Magnetic *Azimuth* of the Sun (or any Star, when it is near the prime Vertical, and considerably elevated above the Horizon) be found according to the Directions already given, before it arrive at the Meridian, and note well the Altitude, or let the Index remain fix'd at the same Point on the Arch.

2dly, Find the Magnetic *Azimuth* of the Sun or Star in like manner as before, when it is exactly at the same Degree of Altitude, after it has pass'd the Meridian: And,

3dly, If these two Magnetical *Azimuths* are equal, the Needle has no Variation: If unequal, add them together, and half their Sum will be the true *Azimuth*; or subtract the less from the greater, and half the Difference will be the Variation required. The
Cir-

Circumstances of the Observation will the more readily discover whether the Declination is Easterly or Westerly.

N. B. Though it would be very commendable in Gentlemen who use the Sea, to learn the Names of most of the principal Fix'd Stars, yet even that Knowledge is not necessary in the Use of this Instrument: Neither is it needful in this Case to know exactly the Latitude of the Place of Observation, provided the Difference of Latitude between the Observations be not very great: It is sufficient, that Care be taken to observe the self-same Star, before it comes to the Meridian, and after it has pass'd it; and for the sake of greater Exactness, the Caution before given should be regarded, to wit, That the Star be at some considerable Height above the Horizon, and also near the prime Vertical.

XIV. *An Account of a Book presented to the Royal Society, and intituled, Notitia Hungariæ novæ Historico-Geographica, &c. Auctore Matth. Belio. By the Reverend Zachary Pearce, D. D. F. R. S. &c.*

THE Author of this Work is the Reverend *Matthias Bell*, a Pastor among the *Lutherans* at *Presburg* in *Hungary*. About twelve Years ago he publish'd an Account of what he intended to execute; and by the Encouragement of his present Imperial Majesty, and some of the Nobility, he went
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