# HILKIAH BEDFORD, THE UNIVERSAL RING-DIAL

*London*

## *The Deſcription of the* Univerſal Ring-Diall *which ſheweth the* Hour *of the Day in any part of the World.*

IT is projected out of two great Cirdes on the *Sphere*, An *Axis*, and a little *Ring* to hang it by. The greater Circle is the *Meridian*; one quadrant or quarter of it is divided into 90. degrees, to ſet it to the *Latitude* of the place wherein you are: On the other ſide of this *Meridian*, is a quadrant of *Altitude*, to take the height of the *Sun*, whereby you may find the *Latitude*.

The leſſer Circle, is the *Æquinoctial*, divided into 24. equall parts or *Hours*, with their halfes and quarters; which are numbred but from III. in the morning, to IX. at night: the reſt of the *hours* are left out, being ſeldome or never uſed.

The *Diameter*, or broad *Plate*, hath a ſlit in the middle; and upon one ſide are the Moneths and Days of the Year graduated to every fifth Day. On the other side is the *Declination* of the *Sun*, from the *Æquinoctial* to every fifth Day, which is to be uſed with the Quadrant of *Altitude*, to find the *Latitude* of the place. The little *Ring* is made to ſlide along the Quadrant, with a small *tooth* to ſet it to the *Latitude*; which if you know not, you may find in this manner,

## *How to find the* Elevation *of the* Pole, *or* Latitude *of the Place.*

First ſet the *Hole* in the moving piece, to the day of the Moneth; then turn the other ſide, and againſt the hole you ſhall find the *Suns Declination* for that day. The ſame day you muſt take the *Meridian Altitude* of the *Sun*, which will be at twelve a clock every day, and may be performed by this *Inſtrument* thus: Put a *Pin* into the *Hole*, which you ſhall find in the *Greateſt Circle*; Then move the *tooth* to the beginning of the degrees in the leſſer Quadrant, and turn the *Pin* next to the *Sun*: and that degree which is cut by the *ſhadow* of the *Pin* is the height of the *Sun*.

If the time of your obſervation be from the 10h. of *March*, to the 13th. of *September*, you muſt ſubſtract the *Declination* out of the *Altitude*, and the remainder is the height of the *Æquinoctiall*; which number being taken out of 90. degrees, ſheweth the Latitude of the place.

1. *EXAMPLE.*

Suppose the *Latitude* were unknown to you, and you would find it out yourſelf, admit on the I I. of *June*; you muſt by the former Rule find the *Declination* of the *Sun* for that day, which will be 23. degrees and a half, or 30. minuts *Northwards*: then take the height of the *Sun* at 12. a clock, which near about *London*, will be 62. degrees; ſubſtract the *Declination* 23. degrees, 30. minutes, out of 62. gr. and the remainder will be 38. degrees, 30. minuts, the height of the *Æquinoctiall*; take this 38. gr. 30′ from 90. degrees, the remainder will be 51. deg. 30. min. the *Latitude* at *London*.

Now if you obſerve in the Winter half year, *viz.* from the 13th. of *September*, to the 10th. of *March*, then you muſt add your two ſums together; and the ſum taken out of 90. gr. will be the *Latitude*, as before.

2. *EXAMPLE.*

Admit the 10th. of *December*, the *Suns Declination* will be 23. gr. 30′ *Southward*, the *Meridian Altitude* 15. gr. add theſe two ſums together, which make 38. gr. 30. min. the height of the *Æquinoctiall*; which being ſubſtracted from 90. gr. leaves 51. gr. 30. min. as before.

## *How to find the Hour of the Day.*

You muſt ſet the *tooth* to the height of the *Poles Latitude*, and the *Hole* in the *Plate* you muſt ſlide to the day of the Moneth; then draw out the *Æquinoctiall*, or leſſer Circle, and as neer as you can, gueſs at the hour, and turn the *hole* to it; then hold the Inſtrument by the little Ring, and move it, till the *Sun* ſhine through the *Hole* upon the middle line in the *Æquinoctial*, that is the *Hour* of the Day: And the *Meridian*, as it hangeth, ſheweth the true *South* and *North* parts of the *World*.

*This, or any other* Mathematical *Inſtruments, either in* Silver, Braſs, *or* Wood, *are made by* Hilkiah Bedford, *at the* Signe *of the* Globe *near* Holborn-Conduit.

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