THOMAS STIRRUP, HOROMETRIA Or the Compleat DIALLIST

London 1652 (A Second Edition was published in 1658)



"HOROMETRIA Or the Compleat DIALLIST" is a small format book composed of 'five Books' and an Appendix.

THE FIRST BOOK.

Shewing the meaning of some of the usefullest termes of GEOMETRY, which be most attendant unto this Art of DIALLING: With a description of some of the chief Points, Lines and Circles imagined in the Sphere: Being very fit to be understood of all those that intend to practice either in the Art of NAVIGATION, ASTRONOMIE, OR DIALLING.

CHAP. I.

Of certain terms of Geometry, necessary to be known of the unlearned, before proceeding in this Art of Dialling.

CHAP. II. To a line given, to draw a parallel line, at any distance required.

C H A P. III. To perform the former proposition at a distance required, and by a point limited.

C H A P. IIII. The manner how to raise a perpendicular line, from the middle of a line given.

CHAP. V.

To let a Perpendicular fall from a point assigned, unto the middle of a line given.

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The Dialling Quadrant used by Stirrup C H A P. V I. To raise a Perpendicualr upon the end of a line given.

C H A P. V I I. To let a perpendicular fall from a point assigned, unto the end of a line given.

C H A P. V I I I. Certain Definitions Astronomicall, meet to be understood of the unlearned, before the proceeding in this Art of Dialling.

> C H A P. I X. Of the six greater Circles.

C H A P. X. Of the foure lesser Circles.

THE SECOND BOOK. Shewing Geometrically how to resolve all such Astronomical Propositions as are of ordinary use, as well as the Art of *Navigation*, as in this Art of *Dialling*.

CHAP. I.

The description of the Scale, whereby this work may be performed.

12 11	10	91	8	7	6	5	4	3	2 1	9
1.00	90	180	170	160	501	40	130	12	0 1 10 1	7

The Scale Rule for Dial Construction.

CHAP. II.

How speedily with Rule and Compasse, to make an angle containing any degrees assigned, or to get the degrees of any angle made.

CHAP. III.

To finde the altitude of the Sun by the shadow of a Gnomon set perpendicular to the Horizon.

ges: 209 Page Size: 6⁷/8" × 5" Illustrations: Numerous

CHAP. IIII.

To finde the altitude of the Sun by the shadow of a Gnomon standing at right angles with any perpendicular wall, in such manner that it may lie parallel unto the Horizon.

C H A P. V. The Almicantar, or height of the Sun being given, to finde the length of the right shadow.

C H A P. VI. The Almicanter, or height of the Sun being given, to finde the length of the contrary shadow.

C H A P. V I I. Having the distance of the Sun from the next Equinoctiall point, to finde his Declination.

CHAP. VIII.

The Declination of the Sun, and the quarter of the Ecliptique which he possesseth being given, to finde his true place.

C H A P. I X. Having the Latitude of the place, and the distance of the Sun from the next Equinoctiall point, to finde his Amplitude.

C H A P. X. Having the Declination and Amplitude of the Sun, to finde the height of the Pole.

C H A P. X I. Having the Latitude of the place, and the Declination of the Sunne, to finde his Amplitude.

C H A P. X I I. The elevation of the Pole, and the Amplitude of the Sun being given, to finde his Declination.

C H A P. X I I I. Having the Latitude of the place, and the Declination of the Sun, to finde his height in the Verticall Circle, or when he shall come to be due East or West.

C H A P. X I V. Having the Latitude of the place, and the Declination of the Sun, to finde the time when the Sunne cometh to be due East or West.

C H A P. X V. Having the Latitude of the place, and the declination of the Sun, to finde what Azimuth the Sun shall have at the houre of six.

C H A P. X V I I. The Letitude of the place, the Almicanter, and Declination of the Sun being given, to finde the Azimuth.

C H A P. X V I I I. The Latitude of the place, the Declination of the Sun, and the Altitude of the Sun being given, to finde the houre of the day.

C H A P. X I X. Having the Azimuth, the Suns Altitude, and the Declination, to finde the houre of the day.

C H A P. X X. Having the houre of the day, the Suns altitude, and the declination, to finde the Azimuth.

C H A P. X X I. Having the Latitude of the place, and the Declination of the Sun, to find the Ascensionall difference. C H A P. X X I I. Having the Declination of the Sun to finde the Right Ascension.

C H A P. X X I I I. Having the Right Ascension of the Sun or Star, together with the difference of their Ascensions, to finde the Oblique Ascension.

> C H A P. X X I V. How to finde the Altitude of the Sun without Instrument.

C H A P. X X V. How to finde the Latitude of the place, or the Poles elevation above the Horizon, by the Sunne.

The Third Book.

Shewing Geometrically how to describe the Houre-lines upon all sorts of Planes, howsoever, (or in what Latitude soever) scituated, two manner of wayes, without exceeding the limits of the Plane.

C H A P. I. How to examine a Plane for a Horizontall Diall.

C H A P. I I. Of the trying of Planes, whether they be Erect or Inclining, and to finde the quantity of Inclination.

> C H A P. I I I. To finde out the Declination of a Plane.

C H A P. I V. How to draw the Meridian line upon an Horizontall plane, the Sun shining thereon.

> C H A P. V. Of making the Equinoctiall Diall.

C A A P. V I. The drawing of a Diall upon the direct Polar Plane.



Dial on a Direct Polar Plane.

C H A P. V I I. The making of an erect Meridian Diall.

C H A P. V I I I. To draw a Diall upon an Horizontall plane.

C A A P. I X. To draw a Diall upon an erect direct verticall Plane, commonly called a South or North Diall.

C H A P. X. To draw a Diall upon a direct verticall plane, inclining to the Horizon.

CAAP. XI.

To draw a Diall upon an erect, or vertical plane declining, commonly called a South or North erect declining Diall.

CHAP. XII.

How to draw a Diall upon an horizontall plane, otherwise then in the eighth Chapter was shewed.

CHAP. XIII.

To draw a Diall upon a direct verticall plane, as well erect as inclining, otherwise then in the ninth Chapter was shewed.

CHAP. XIV.

The declination of an upright plane being given, how thereby to finde the elevation of the pole above the same, with the angle of Deflexion, or the distance of the substile from the Meridian : and also the angle of the inclination betwixt both Meridians.

CHAP. XV.

To draw a Diall upon an erect or Verticall plane declining, otherwise then in the 11 Chapter was shewed.

CHAP. XVI.

The inclination of a Meridian plane being given, how thereby to finde the elevation of the pole above the plane, the distance of the substile from the Meridian, and the angle of the inclination of the Meridian of the plane to the Meridian of the place.

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C H A P. X V I I. To draw a Diall upon the Meridian inclining plane.

CHAP. XVIII.

The inclination and declination of any plane being given in a known Latitude, to finde the angle of the intersection between the plane and the Meridian, the ascension and the elevation of the Meridian, with the arch thereof between the Pole and the plane, and also the elevation of the Pole above the plane, the distance of the substile from the Meridian, with the inclination between both Meridians.

> C H A P. X I X. To draw a Diall upon a declining inclining Plane.

> > THE FOURTH BOOK.

Shewing how to resolve all such Astronomical Propositions (as are of ordinary use in this Art of Dialling) by help of a Quadrant fitted for the same purpose.



The Capital letter 'H' starting the Fourth Book.

C H A P. I. The description of the Quadrant.

CAAP. I.

Of the use of the line of Sines. Any radius not exceeding the line of Sines being known, to finde the right Sine of any arch or angle thereunto belonging.

C H A P. I I I. The Right Sine of any arch being given to finde the Radius.

C H A P. VI. The right Sine, or the Radius of any Circle being given, and a streight line resembling a Sine, to finde the quantity of that unknown Sine.

CHAP. V. The Radius of a circle not exceeding the line of Sines being given, to finde the chords of every arch.

C H A P. V I. To divide a line by extream and mean proportion.

C H A P. V I I. To find a mean proportionall line between two right lines given.

C H A P. V I I I. Having the distance of the Sun from the next equinoctiall point, to find his declination.

C H A P. I X. The declination of the sun, and the quarter of the ecliptick which he posseseth being given, to find his place.

C H A P. X. Having the Latitude of the place, and the distance of the sun from the next equinoctiall point, to find his amplitude.

C H A P. X I. Having the declination and amplitude to finde the height of the pole.

C H A P. X I I. Having the latitude of the place, and the declination of the Sun, to find his amplitude.

C H A P. X I I I. Having the elevation of the pole, and amplitude of the Sun, to find his declination.

C H A P. X I I I I. Having the latitude of the place, and the declination of the Sun, to find his height in the Vertical circle.

C H A P. X V. Having the latitude of the place, and the distance of the Sun from the next Equinoctiall Point, to find his height in the verticall circle.

C H A P. X V I. Having the latitude of the place and the declination of the Sun, to finde the time when the Sun commeth to be due east of west.

C H A P. X V I I. Having the latitude of the Place, and the declination of the sun, to find his altitude at the houre of six.

C H A P. X V I I I. Having the latitude of the place, and the height of the sun at the hour of six, to find what azimuth he shall have at the houre of six. C H A P. X I X. Having the declination of the sun, to finde his Right Ascension.

C H A P. X X. Having the latitude of the place, and the declination of the Sun, to finde the Ascensionall difference.

C H A P. X X I. The Latitude of the place, the Almicanter, and declination of the Sun being given, to finde the Azimuth.

C H A P. X X I I. The latitude of the place, the declination and altitude of the Sun being given, to find the houre of the day.

THE FIFTH ВООК. Shewing how to describe the houre-lines upon all sorts of planes howsoever, or in what Latitude soever scituated, by a Quadrant fitted for the purpose.



Finding the Inclination of a Plane.

C H A P. I. How to examine a plane for an Horizontall Diall.

C H A P. I I. Of the trying of planes, whether they be erect or inclining, and to finde the quantity of their inclination.

> CHAP. III. To finde the Declination of a plane.

C H A P. I V. To draw the houre-lines upon the Horizontall, the full North or South planes, whether erect or inclining.

> C H A P. V. To draw a Diall upon a South or North erect declining plane.

C H A P. V I. To draw a Diall upon an East or West Inclining plane.

C H A P. V I I. To draw a Diall upon a declining inclining plane.

C H A P. V I I I. In any erect declining Diall, having the distance of the substile from the Meridian, in a known Latitude, how thereby to get the Cocks elevation, and the declination.

THE APPENDIX.

CHAP. I.

How to describe the Equinoctiall, Tropicks, and other parallels of the Suns course or Declination, in all kinde of planes.

C H A P. I I. Shewing how to inscribe the parallels of the length of the day on any plane.

C H A P. I I I. Shewing how the Italian and Babylonish houres may be drawn upon all kinde of planes.

C H A P. I V. Shewing how the Jewish hours may be drawn upon any plane.

C H A P. V. Shewing how to draw the Azimuths, or Vertical Circles in all kinde of planes.

C H A P. V I. Of the Almicanters or circles of Altitude.

C H A P. V I I. How to draw a Diall on the Seeling of a Room.

FINIS.



Vertical Dial with Italian and Babylonish Houres