JOHN BLAGRAVE, THE MATHEMATICAL JEWEL

London 1585



"THE MATHEMATICAL IEVVEL" is a book describing many sorts of technical practices. It is the sixth book that contains 41 chapters about dialling.

The first booke of the Mathemati-

call lewel: set foorth by Iohn Blagraue of Reading, Gentleman, Conteineth very usefull Geometricall principles, which may be called the rules of the compasse: it containeth also after that, the principles and Rudiments of Astronomie and Cosmographie, set downe as the first footesteppe for the vnlearned, which I aduertise the learned to passe ouer.

The seconde booke of the Mathe-

maticall *lewel*: compiled by Iohn Blagraue of Reading, Gent. shewing the composition and making of the Jewel: being a most necessarie and profitable worke for all those to be well seene in, which shall indeuour to describe mappes or sea cards, or to project artificially the globe or any part thereof into a plaine or platforme, as exact and perfite for any purpose as the globe it selfe.

The third booke of the Mathe-

maticall *Iewel*: gathered and set foorth by Iohn Blagraue of *Reading, Gentleman*: conteineth al the propositions, and conclusions of Iohannes Stophlerus, Iohannes Sconerus, Iohannes Roijas, G. Frisius, or any other, written on their severall Astrolabes, set downe heere in the selfsame order

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A North wall declining West 53¹/₂ deg.

The fourth booke of the Ma-

thematicall *Iewel*: newly compyled and set foorth by Iohn Blagraue *of Reading Gentleman* : *conteineth divers* Astronomicall Propositions, and vses of the Iewel, of his owne inuention, no lesse pleasant and commodious, then those whiche by other Authours haue beene founde heretofore on their sundrie Instruments.

The fifth booke of the Mathe-

maticall *lewel*: newly inuented, compiled and set forth by Iohn Blagraue of *Reading*, *Gentleman* : *teaching most* plainely to performe on the Iewell the whole art of sphericall triangles, without a-

The sixt book of the Mathe-

maticall *Iewel*: newly compiled, deuised, and set foorth by Iohn Blagraue of *Reading, Gentleman* : shewing the Theoricall reason and grounde of all Dialles and Horizons, and the practicall making of all sortes of horizontall, murall, declining, reclining, and inclining *Dials, by the onely helpe of this Mathematicall* Iewel, and that most plainely, readilie, and exactly, as hereafter shall followe: which worke, besides the art of Diall making, bringeth a man acquainted with the full vunderstanding of the spheare, and is the dore into the same.

Chapter I.

Of certaine preambles to be noted in vnderstanding this werke following.

Chapter 2.

Of the distinction on Dials into two kinds, Instrumentall and Sphericall.

Chapter 3. Of the definition and derivation of Dyals and the grounde of them all.

Chapter 4. What the cocke or Gnomon of euery Dyall is, and by what reason they give the true shade of the Dyall.

Chapter 5.

Of the division of Horizons, especially into three sortes.

Chapter 6. Of the division of all Dials into three sorts, and whie they make shew of greater diuersite then there is.

Chapter 7.

How to make the first kinde of dial to the Equinoctial horizon, that is, where one of the poles is zenith.

Number of Pages: Dialling section, 41 Chapters spread over 30 pages Illustrations: Many



To a South flat reclining 56 degrees, declining VVest 78¹/₂ degrees

Chapter 8.

How to make the second kinde of dial to a right horizon, that is, where the Equinoctiall cutteth the zenith, together with the ground and reason of al dials to any right horizon.

Chapter 9. How to make the third kind of diall to an oblique horizon, which they commonly cal an horizon diall, and that very easily.

Chapter 10. How to make a diall to a perpendicular wall beholding the South fully, called of some Authors Horologium verticale.

> Chapter 11. To make a diall to a ful Northwall.

Chapter 12. How to make a diall to an East wall.

Chapter 13. How to make a Diall to a West wall.

Chapter 14. Of declining walles, and what circles of the spheare they represent. Chapter 15. How to know the scituation of any wall, and to finde how much he declineth.

Chapter 16. How by the declination of any wall knowne, to finde his elevation with his angle of deflexion.

Chapter 17. To performe the last chap. a second way by the 6. chap. of spherical triangles.

> Chapter 18. *To performe the same a third way.*

Chapter 19. How to make a diall to any declining wall, respecting the South.

Chapter 20. How to make a Dyall to any declining Wall respecting the North.

Chapter 21. How to order Dyals that decline very farre East and west.

Chapter 21. Of wals reclining and inclining, and of the diuersitie of them. Chapter 23. How to take the reclination, or inclination of any wall or flat, togither with his declination if any be.

Chapter 24. How to make a Dyall to a south or north reclining or inclining wall bancke or flatte.

Chapter 25. How to make a Dyall to an East and West wall, bancke of flat reclining or inclining.

Chapter 26. How to finde the angles of the poles eleuation, dials deflection, and meridians ascension, to any reclining or inclining wall declining.

Chapter 27. How to performe the last chapter by sphericall triangles very easily, and with great pleasure and profite.

Chapter 28. The angles of reclination, declination, eleuation, deflection, and ascension had as before, how to make the dial to a reclining wall, bancke, or flat declining.

> Chapter 29. Of inclining dials reclining.

Chapter 30. Howe to knowe in what countrie any declining, reclining, or inclining diall, woulde or of right shoulde serve as an horizon diall, and also to make him shewe the houres of the same place together with yours.

Chapter 31. How to place a flat representing the horizon of any countrie, citie or place in the worlde both according to the longitude & latitude of the same.

Chapter 32.

To perfourme the same by sphericall triangles.

Chapter 33. To describe dials to al maner of declining walles, and also to all East and West reclining and inclining flats more at plaesur then yet hath been shewed without foreknowing the angles of eleuation or deflexion.

Chapter 34. To reduce all reclining and inclining flats declining vnto East and West, reclining and inclining flattes to some one latitude or other, and thereby most easily to make the Dyall.

> Chapter 35. To do the same somewhat easier.

Chapter 36. To performe the 31. Chapter somewhat more easily, or at the least more pleasingly.

Chapter 37. A most easie and briefe way to reduce all reclining and inclining flats declining, vnto East and West reclining flats to a new latitude, otherwise then in the 34. & 35. Chap. by helpe of sphericall triangles.

Chapter 38. A briefe note how East and West reclining or inclining Dyals are to be made two seuerall wayes.

Chapter 39. How to make a diall to any East or West, reclining or inclining flat, by helpe of spherical triangles most easily.

Chapter 40. Most excellently and easily to make dialles to al maner of reclining or inclining flats declining, by the Iewell and helpe of spherical triangles.

Chapter 41. To know in what Longitude and Latitude our horizon or any other shall represent any declining wall proposed, or els any circle of position proposed.

The conclusion.

The order of the sixe bookes behinde.