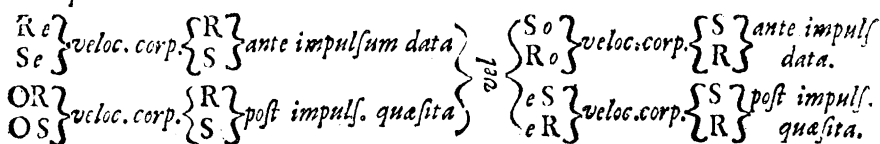R S *Corpora æqualia, vel* R *corpus majus,* S *corpus minus.*

a *Centrum Gravitatis five anfa Libræ.* Z *fumma velocitatum utriufque corporis.*

$$\begin{matrix} \text{R } e \\ \text{S } e \end{matrix}\Big\} veloc.\ corp.\begin{Bmatrix} R \\ S \end{Bmatrix} ante\ impulfum\ data \Big)$$
$$\begin{matrix} \text{OR} \\ \text{O S} \end{matrix}\Big\} veloc.\ corp.\begin{Bmatrix} R \\ S \end{Bmatrix} poft\ impulf.\ quæfita \Big)$$

$$\begin{matrix} S\,o \\ R\,o \end{matrix}\Big\} veloc.corp.\begin{Bmatrix} S \\ R \end{Bmatrix} ante\ impulf\ data.$$
$$\begin{matrix} e\,S \\ e\,R \end{matrix}\Big\} veloc.corp.\begin{Bmatrix} S \\ R \end{Bmatrix} poft\ impulf.\ quæfita.$$

[ *Lege fyllabas* ( *quamvis disjunctas* ) R e S e o R o S *vel* R o S o e S e R *in Linea cujuflibet Cafus,* & *harum quæ fcribitur in* Schemate *more* Hebraico, *ea indicat motum contrarium motui, quem notat cujufvis fyllabæ fcriptio* Latina: *Syllaba conjuncta quietem Corporis denotat.* ]

$$\text{Calculus} \quad \begin{matrix} R+S:S::Z:R a \\ R+S:R::Z:S a \end{matrix}\ \Big|\ \begin{matrix} R e - 2 R a = o R \\ 2 S a + S e = o S \end{matrix}\ \Big|\ \begin{matrix} S o - 2 S a = e S. \\ 2 R a + R o = e R. \end{matrix}$$

*Natura obfervat regulas Additionis* & *Subductionis* Speciofæ.

### An Account of two Books.

I. HISTORIA CÆLESTIS ; Ex Libris & Commentariis M.Stis. Obfervationum Vicennalium T Y-CHONIS BRAHE , *Dani* , Auguftæ Vindelic. *An.* 1666. *in Folio.*

These Obfervations of the Noble *Tycho* , as they were procured and preferv'd by thofe Three Mighty Emperours, RUDOLPH. II. FERDINAND. II. and III ; fo they were lately by the Command of his Imperial Majefty LEOPOLD made publick. They are ufher'd in by a *Liber Prologomenos*, compendioufly reprefenting the Obfervations made from the time of the very Infancy of Aftronomy unto that of its Reftauration by the Illuftrious *Tycho*; and reduced into 7. Claffes, *viz.*

1. The *Babylonian* Obfervations; from A. before Chrift 721. unto A. 432.
2. The *Grecian*; from A. before Chrift 432. unto the beginning of the Vulgar Chriftian Account.
3. The *Alexandrian*; from A. *Chrifti* 1. until A. 827.
4. The *Syro-Perfian*; from A. C. 827. unto 1457.
5. The *Norimbergian*; from A. C. 1457. unto 1509.

6. The

6. The *Boruſſian*; from *A. C.* 1509. to 1529.

7. *Mixt* Obſervations ; from *A. C.* 1529. to 1582.

In which year ( 1582 ) do begin the Obſervations of *Tycho* ( as is af-firm'd in this *Edition*) contain'd in 20 Books , and made in as many years, ending *An. Chr.* 1601 , which was the end of *Tycho's* Life : Of which time yet there being wanting one year ( *viz.* 1593 ) of the *Brahean* Ob-ſervations , *that* is ſupply'd by the *Hoſſian* ; and by a *Catalogue* of the *Fixt Stars* , made and digeſted by the Authority and Care of that Re-nowned Prince for Learning and Magnanimity , *William* , Landgrave of *Heſſen* , and by the Labours of *Rhotmannus* and *Birgius*.

To all theſe is added a Continuation of ſuch Aſtronomical Obſervations as were made from the time of *Tycho's* death unto *An.* 1635 , by *Maſtli-nus* and *Schickardus*.

Having given the Reader this ſhort Account , I find my ſelf obliged to give him notice withall of a Paper publiſh'd this year , entituled *Specimen Recognitionis* nuper editarum *Obſervationum Aſtronomicarum* , Nob. Viri *Tychonis Brahe* , printed at *Copenhagen* in 4º : wherein are remark'd by *Eraſmius Bartolinus* the more conſiderable Errors in the Obſervations of *An.* 1582. In this Edition of the *Hiſtor. Cæleſtis* , by comparing it with the *Original*, in the power of the preſent King of *Denmark*. In which Pa-per hopes alſo are given of a more correct Edition , and that of the *Origi-nal* it ſelf ; together with the Obſervations both from *An.* 1563. to *An.* 1582. and thoſe of *An.* 1593 ; all wanting in this Edition of *Ausburgh*.

*11.* R. P. ANDREÆ TACQUET *e Soc. J. Opera Mathema-tica* ; *with many Schematiſmes thereto belonging.* Antwerp. 1669. *in Fol.*

THeſe Works contain ,

1. Of *Aſtronomy* 8 Books , wherein the Author hath explain'd the whole Doctrine of that Science in ſuch a gradual Scientifick Order , that now (as himſelf in his own Preface intimates) a Student without the Aid of a Maſter may learn the whole by his own Study , which was formerly not eaſie to attain with the beſt Inſtructions.

It may be , the Inquiſitive *Reader* will be deſirous to know , what *Sy-ſteme of the World* it is , this Author inſiſts on ; concerning which we ſhall give you his own words, *p.* 326.

*Hanc controverſiam (ſc. de* Motu Terræ) *Joh. B. Ricciolus* Almag. l. 9. *ea tum eruditione tum copia proſecutus eſt, ut facile omnes in hoc negotio ſupera-verit. Primo,* Copernicanorum pro Motu Terræ *Argumenta* 49. *deducit ac deſtruit ; pari deinde cura , quæ contra* Terræ Motum *afferri ſolent & poſſunt Argumenta , vid.* 77. *recenſet. Mihi vero , cum nihil hactenus in utram-vis partem adductum videam , quod Probabilitatis metam excedat , his im-morari non eſt animus. Vnum eſt tamen ex omnibus contra* Terræ Motum

*ipſius*

*pfius* Riccioli *Argumentum* a Gravium defcenfu *petitum*, *cui vim ipfe De-monftrationis ineffe putat* ; *quod examinare hoc loco accuratius opera pretium judicavi.*

This with other Arguments he refuteth ; but declareth *p.* 330. That, though he knows no Argument, demonftrating the *Reft* of the *Earth* and *Motion* of the *Sun* ; yet the Authority of Holy Writ , now feconded by that of the Sacred Congregation of the Cardinals, put it out of doubt.

Concerning the Doctrine of *Motion*, the Author faith thus , *p.* 15, *Motuum* Compofitorum *Contemplatio digna fane eft., quae a Geometris excolatur. De folo motu* Volutionis *confcripfi Tractatum integrum , quem cum libris* Cylindricorum *& Annularium in lucem edidi. De Motu* Projecto-rum , *qui & ipfe* Compofitus *eft , fubtiliffimi exftant Libri* Galilæi *&* Torricellii: *Et præter hæc, alia fuperfunt innumera, de quibus integra Nova Scientia condi poffit.* (Which is accordingly done by the Excellent Dr. *Wallis* in his Book now in the Prefs. )

For the eafe of Calculating an *Eclipfe* of the *Sun*, we find , that this Author *p.* 177. determines , in what part of the Earth fuch an Eclipfe fhall appear , without the Aid of *Parallax* , and that the Sun's *Parallax* , as to the determination of Celeftial Motions , may be fafely neglected. And *p.* 40. he rejects the *Senfible Inequality* of the *Solar* or *Tropical* years ; as alfo *p.* 60. the *Irregularity* of the *Obliquity* of the *Ecliptick*, of the *Proceffion* of the *Equinoxes and Excentricity. Pag.* 127. he folves that Doubt of *Ricciolus* , That it cannot be exactly and evidently known by any Natural Obfervations made of the Moon or any Star , what the *Parallax* is , without the fore-knowledge of the *Parallax* , or diftance from the Earth. And *p.* 193. avoids thefe Inconveniences in affigning the Declinations of the Fixed Stars. *P.* 338. this Author afferts, that the *Comets* and *New Stars*, that have appear'd fince 1572, have been far *above* the Moon ; and that *Ricciolus* about this Controverfie feem'd too favourably inclined to *Claramontius*, afferting the contrary.

Concerning the Caufe of the *Secondary* light of the Moon before and after the New , to wit, the obfcure part of her appearing like kindled glittering Afhes , our Author affigns it to be the Suns rays reflected from the bright Hemifphere of the Earth to the darker portion of the Moon , and thence again directly reflected to the Earth deftitute of the Sun's light. This *Phænomenon* he faith , is learnedly explain'd in *Philof. Optica Nic. Zucchii* from *p.* 247 to *p.* 260.

The Author hath not framed nor annex'd any *Tables* to his Book , although he abundantly fhews , How they may be computed : referring his Reader to thofe of *Tycho, Reinholdus, Longomontanus, Kepler, Lanfberg, Wendelinus, Bullialdus, Petavius, Reinerius, Ricciolus* ; to which may be added thofe of *Duret, Billy, Street* (which laft fixes the *Nodes* and *Aphelions*) and *Wings*, now in the Prefs.

To the end of thefe 8 Books are annext *Proportions* for the 28 Cafes of

*Spherical Trigonometry*. Thofe that defire to be farther fatisfied, may read *Trigonometria Britannica* of *Gellibrand* and *Newton*, the *Idea Trigonometriæ* by the Lord Bifhop of *Sarum*, Dr. *Seth Ward*; and alfo *Bonavent. Cavalerii* Trigonometria, and his *Directorium Univerfale Uranometricum*, but efpecially his *Compendio delle Regole Trigonometriche* & *Centuria di Problemi*.

2. Of *Practical Geometry* 3 Books.

In the *Firft* the Author handleth

The Conftruction of the Tables of *Sines, Tangents,* and *Secants*.

The Refolution of Right-lined Triangles.

The Menfuration of the diftance of Objects, as well unacceffible as acceffible.

The Heights of Mountains, Towers, Clouds, Rainbowes; the Depths of Wells and Vallies. He concludes the perpendicular height of the burning Mountain *Ætna* to exceed 5 *Bononian* Miles; of Mount *Caucafus* beyond the *Cafpian*-Sea to be 51. Mount *Athos* of *Greece* 28. *Cafius* of *Syria* 20. the *Alpes* of *Italy* and *Pic* of *Tenariffe* 10 Miles. The Circumference of the Earth, the Diftances of the Sun, Moon, and Earth.

In the *fecond* Book, he handles the Dimenfion of Plain Surfaces, either Regular or Irregular, and takes the *Ichnography* or Defcription in Paper, of any Figure given of the furface of the Earth : Afferts the Poffibility of the *Quadrature* of the *Circle*; and handles the Transformation of Plain Figures, to wit, their Addition, Subftraction, Augmentation, Diminution, Comparifon; further the dividing of a Plain Triangle, in a given Reafon by a line paffing through a Point any where affigned : This he doth largely in 16 *Propofitions*, becaufe upon it chiefly depends the Divifion of other Right-lined Figures; and becaufe he found divers Determinations wanting, when the point is given within. Thofe that are defirous to fee this *Analytically* done, may find it in *Herigon* with a Conftruction thereof; as alfo a *Geometrick* Conftruction thereof in *Van Schootens* Mifcellanea; and another moft excellent Conftruction at the end of *Van Ceulen* de *Circulo & Adfcriptis*.

Afterwards our Author proceeds to the dividing of other Figures, in a given Reafon, or by parallel lines, and fheweth how to apply the whole to *Practice* in the Field.

In the *third* Book the Author firft meafureth fuch Solids as are contained under a Plain Surface. Secondly, fuch as are contained under a Curved Surface. Thirdly, He meafureth the *Mundane* Bodies, as the *Surface* of the *whole Earth*; where he is pleafed to conclude, that at the Day of Judgement, a lefs portion of it then *England*, will ferve to hold all its Inhabitants, and their Infants, that ever have been, or in likelihood may be hereafter, till then, fuppofing the World fhould laft 10000 years. He meafureth alfo the Solidity of the Earth, and Ocean; the Magnitude of the Sun, Moon,

and Earth. The Increafe, and Diminution, the Transformation and Comparifon of divers Solids, and the Menfuration of divers of their Surfaces.

3. *Of* Opticks 3 *Books*.

In the *firft*, he handleth the *fimple* and *direct* Appearances of Objects meaning fuch appearances as are not liable to Reflection or Refraction; and herein he faith, that paffing by flight matters, he onely treats of fuch as are either new, or of the better efteem; fuch as are the Properties of the fight, the manner of its perceiving a Diftance; and the Place of the Eye being affigned, to find that Height, in which a greater Length or Breadth fhall appear equall to a leffer Length or Breadth, or any affigned Length or Breath fhall appear in a given Proportion. He likewife finds the Portion of a *Cone* or *Cylinder*, feen according to the Magnitude of the Figure, and Pofition of the Eye, and explains the Moons *Phafes*.

In the 2d. He handles the Theory and Practice of the *Perfpective* or *Scenographick Projection*, or Tranfcription of a given Magnitude into a Plain, which cuts the Optick *Pyramid*; wherein he explains the Direct appearance, and the Monftrous deformation of an Object, which at a certain place fhall appear beautiful.

In the 3d. He treats of the *Aftronomick Projections* of the *Spheare*, and thence derives the triple *Aftrolabe*, and fhews their ufes, and the Conveniences or Inconveniences of each Projection: *viz.* the Projection on the *Plain* of the *Æquator*, the Eye being in one of the *Poles*; or on the *Plain* of the *Colure* of the *Solftices*, the Eye being in one of the *Æquinoctial Points*; and the *Orthographick* Projection, by Perpendiculars, falling from the refpective Points of the Circles of the Spheare, on the Projecting Plain: Such a Projection, if the Plain be the Meridian, *Ptolomy* called the *Analemma*.

If the Eye be in the *Zenith* or *Nadir* projecting on the *Plain* of the *Horizon*, the Author fheweth, that the Projection will be the fame, as if the Eye were in one of the *Poles* projecting on the *Plain* of the *Æquator*, onely the names of Circles are changed.

Pag. 205. *Nam Circulus qui in illa referebat Æquatorem, in hac Horizontem repræfentat; & Projecturæ Tropicorum reliquorumq; Æquatori parallelorum in illa, in hac funt Projecturæ parallelorum* Horizonti *feu* Almicantarath: *rurfum qui in illa funt Projecturæ* Horizontis, Almicantarath *& Verticalium, in hac projecturæ erunt Æquatoris & Parallelorum ejus, ac Meridianorum. Poftremo recta lineæ, quæ per Centrum Projectionis ducta, erant projecturæ* Meridianorum *in illa, in hac erant* Verticalium Projecturæ; *quare qui illius Projectionis modum probe intellexerit, hanc quoq; nullo negotio perficit.*

Iff

If this had been well observed, there had been no need of Controverting, Whether the *Horizontall* Projection had been a *New* Invention : It is as Ancient as *Ptolomy*, and all the 4 *Quadrants* of several contrivances published by Mr. *John Collins**, are derived from the *Western* side, or the continuance thereof, admitting but a meer Mutation of the Names of Circles, and a projecting of more Parallels.

* Thef Quadrants, *printed, may very conveniently be pasted on* Copper-Plates, *and varnisht; which done, they will be not only very cheap and portable (to be had at* John Marks *at the Sign of the* Golden Ball *near* Somerset-House) *but also serviceable enough, being preferv'd by the Varnish from the accidental injuries of* Ink *and Dirt ; and for thefe very ends made publick, ferving for an Example to introduce the like way for other Mathematical Inftruments.*

4. Of *Catoptricks* 3 Books ; in the *First* of which the Author treats of *Catoptricks* or *Reflection*.

In the *Second*, of the affections of *Plain* Glaffes fimply, or of many fuch, placed either in a Parallel or Inclined Pofition to each other.

In the *Third*, of *Curved Glaffes*, and therein firft the chief affections of *Convex* Sphærick Glaffes ; afterwards of *Concave* Sphærick Glaffes : laftly of *Burning* Glaffes of feveral kinds.

The death of the Author prevented him from Writing of the *Dioptricks*, which was very far advanced by *Des Chartes*, and hath been further promoted fince by *De Beaune*, *Honorato Fabri*, *Manzini*, and in the Century of Optick Problems of *Efchinardus* ; and we may hope that ere long the learned Mr. *Barrow* will enrich the World with his Labours of this and other kinds ; alfo Mr. *James Gregorie*, the Author of *Optica Promota*, hath a Treatife of this Subject in good forwardnefs for the Prefs.

5. Follows the Authors Treatife of *Military Architecture* or *Fortification* ; in which he hath collected fix feveral ways of *Regular* Fortification, and hath likewife divers ways for *Irregular* ones, when the Scituation of the place fo requires ; and interfperfeth divers queftions, and relates fome Tranfactions in the late eminent Sieges of Chriftendome.

6. Follow his *Annularia & Cylindrica* ; the firft 4 Books whereof were firft publifht in 1651, and are common enough to be had here ; which may make the *Reader* wonder at their being reprinted ; efpecially confidering, that though they have defervedly received much applaufe, yet they have likewife been cenfur'd for oppofing and neglecting other Methods, whereby the Author might have rendred, what he delivers, more univerfally and briefly. Concerning the firft 4 Books, *Ant. Labovera* in his Book *de Geometr. veterum promota* thus ;

*Sero venerunt in manus noftras R. P.* Tacqueti *lib.* 4. Cylindricorum & Annularium : *Opus cenfemus abfolutiffimum, ejufq; Authori, qui primus hac de re fuas lucubrationes vulgavit, iftam coronam debitam effe agnofcimus.*

And *Stephen Angeli* in his Treatife *de Infinitis Parabolis, deque Infinitis Solidis, &c.* (printed at *Venice* 1659.) in the *Preface* begins thus,

*Publici Juris fecimus elapso anno* 1658. *libellum quendam, cui titulus*, Sexaginta Problemata Geometrica : *In hujus calce Appendiculam adjunximus, in qua occurritur* Mario Bettino , *Cavaleriana Indivisibilia veluti Dæmonas pavent i. Paucis vero transactis diebus a modo dicti Libelli impressione , incidimus forte* Venetiis *in opus Aureum* And. Tacquet , CYLIN-DRICA & ANNULARIA *nuncupatum*; *in quo cum incideremus in* Schol. *prop.* 12. *l.* 1. *Authorem carpere* Indivisibilia *invenimus*.

*Doluimus vehementer* (faith Angeli) *Opus tanta eruditione refertum non prius ad manus nostras pervenisse ; censura autem in ipso contra* Indivisibilia *pronunciata , parum aut nihil nos turbat : Vetera enim continet & non nisi eorum modica, & imbecilliora, quæ prius ab ipso* Cavalerio *in Præfat.* Geometriæ Indivisibilium , *& a* Guldino *in* Centro-baryca *objiciuntur ; quibus satis superque occurrit ipse* Cavalerius.

And *Angeli* in the Preface of his Treatise *De Infinitorum Spiralium Spatiorum Mensura* ( Venetiis 1660.) having occasion to mention the fruitless endeavour of *Guldin* in finding the Center of Gravity of a Spiral Line , and a Right line equal thereto , faith thus ;

P. Guldinus, *Centrobarycæ* (Anno 1635. & 1640. *editæ*) *Author famosus (at* Cavalerianorum Indivisibilium *contemptor & irrisor, qui dum Indivisibilibus irrisit , seipsum ridiculum præbuit) altius omnibus volatum sumpsit, at conatu irrito, &* Icari *fine , ut ipsemet fatetur.*

But *Guldinus* doth not confess himself in an error in opposing *Cavalier's Geometria Indivisibilium ,* publisht 1632; but faith , he was very aged , of an infirme memory , and that he had not (as we may gather) leisure to peruse it throughly , when he had health , nor health when he had leisure. The Controversie , and the Reply about it , is exceeding pleasant , and to be found with other considerable Miscellanies in the *Geometr. Exercitat.* of *Cavalerius* printed at *Bononia* 1647. Which Book if *Tacquet* had seen ( for he quotes it not) he would probably not have made any such opposition.

*Angeli* doth not only answer what is objected by *Tacquet* , but shews, what famous Authors he hath on his side , who have derived many excellent Inventions from this Method of Indivisibles , *viz.* Beaugrand, Rocca, Magiottus, Van Schoten , Rich. White , Bullialdus , Torricellius , who calls *Cavalier's* First Book the *Ocean* of *Indivisibles ,* and the *Fountain* of *Inventions.* Of which Doctrine he renders many excellent Examples.

Moreover the same *Angeli* in the Preface to his said Tract , *De Infinit, Spiral. Spatiorum Mensura ,* hath these words :

Pro *Indivisibilibus est veritas ipsa , stantque illi omnes præclarissimi Geometræ , quos in* Epist. ad Lectorem *Operis nostri* De Infinitis Parabolis *recensuimus ; quibus nuper ultro se associavit* Vinc. Viviani l. 1. *De Maximis & Minimis , monito post* Prop. 17. *ubi ait , Ut hoc loco , ex adverso indirectæ Antiquorum viæ per duplicem positionem , luce clarius pateat , quantum facilitatis , brevitatis , atque evidentiæ nancifcatur e nova directaque methodo (recte tamen*

*tamen cautequeꞌnſurpata* ) *acutiſſimi* Cavalerii; *per* Indiviſibilium *doctrinam nobis amiciſſimam.*

And *when* thus *carefully* to apply it, of that ſee *Lalovera's Elementa Tetragoniſmica Toloſæ* 1651. where *more Archimedeo* he demonſtrates the truth of this Method ; which Book if *Angeli* had ſeen, he would certainly have quoted it, and admired the Author

For want of this Method, it was, ſaith *Angeli*, by way of complaint, of *Tacquet*, that he omitted ſome Theorems, which by aid thereof he might eaſily have found out. See him in his Preface to his *Infinite Spirals* ; but eſpecially at *Schol.* 3. *Prop.* 15. l. 2.

*Si ergo* Tacquet *recepiſſet doctrinam* Cavalerii, *potuiſſet non ſolum Cubare portionem Cylindrici Parabolici ſuper quacunque Inſinitarum Parabolarum per Baſin Parabolæ & Punctum in latere*; *ſed etiam ex iis*, *quæ in* Exercitat. 4. Cavalerii *tradunt ipſe & Beaugrand, potuiſſet Cubare Segmenta portionis cujuſcunque* Cylindrici Parabolici *reſectæ planis ſectioni maximæ parallelis* : *Imo ex doctrina* Cavalerii *potuiſſet etiam Cubare*, & *portionem* Cylindrici *ſuper* Hyperbola *per baſin Hyperbolæ & Punctum in latere*, & *ſegmenta hujus portionis reſectæ planis ſectioni maximæ parallelis (ſuppoſita tamen* Hyperbolæ *Quadratura.* )

*Angeli* finds afterwards another deſervedly famous Man, *viz.* Dr. *John Wallis*, owning and uſing the Method of *Indiviſibles*, and advancing it to admiration in his *Arithmetica Inſinitorum* ; who in his Book *de Cycloide* at *Oxford* 1659, ſaith thus, *Pag.* 9.

*Supponimus enim* ( *quod et facile*, *ſi opus eſt, probabitur* ) *Planum quodvis tantundem hujuſmodi Converſione ( ſeu Rotatione) producere, quantum eſt quod fit ex eodem Plano in lineam ipſius Centro gravitatis deſcriptam ducto ; quod & de linea quavis ſive recta ſive curva, in eo Plano deſcripta, pariter intelligendum eſt* : *Quod quidem enim ipſe olim me primum inveniſſe putaverim, monitus mox eram, nonnihil apud* Guldinum *exſtare quod huc ſpectet. Id autem ſi animadvertiſſet* Tacquetus, *dum de Cylindricis & Annuꞌaribus acutum Opus conſcripſit, non parum illi fuiſſet adjumento, multaque quæ illic extant, tum Univerſalius tum contractius forte fuiſſent edita.*

All which is not recited here, to diſparage our Author, but to take off the prejudice, which he may beget in his Readers againſt the Method of *Indiviſibles*, which hath been owned by other famous Men, beſides thoſe already recited ; *viz.* by *Mengolus*, who from the Excellencies of *this* Method ; *Archimed's* Method, and *Vieta's* Specious *Algebra*, compos'd his *Geometria Specioſa*; by *Antimo Farby*, *alias* ( as 'tis ſuggeſted) *Hon.* Fabri in Tract. *De Linea Sinuum & Cycloide* ; by *Paſcal*, alias *Dettonville* ; by *Des Cartes* himſelf Vol. 3. of Letters, who ſaith, that by it he ſquared the *Cycloid*, and lately by the excellent *Sluſius, &c.* 2. To remove the other prejudice that may be againſt this Author as defective : for the 5th Book *Cylindricorum & Aanularium* ( now printed with the reſt) the *Prefacer* aſſerts to be firſt extant in 1659. And becauſe we preſume, the reſt of theſe Books are already known and common, and that this hath not formerly been expos'd to ſale in *England* ; and becauſe alſo it ſupplies and compenſates thoſe defects, we think fit to acquaint the Reader with the Argument thereof. The Author divides this Fifth Book into ſix parts :

1. In the firſt he demonſtrates (in 6 *Lemma's* and 9 *Propoſitions*) That, if any Plain Surface have a Rotation about its Axis in any Situation whatſoever, and at any diſtance whatſoever, or none, it produceth a Round Solid equal to an Upright Solid, whoſe Baſe is the begetting Figure, and Height is equal to the Circumference deſcribed by its Center of Gravity. ( *This Univerſal Rule was invented by* Guldin, *and is the Baſis of moſt of his Doctrine* ; *but he could not demonſtrate the ſame, though 'twas much deſired.*)

2. In like manner, If any *Perimeter* have a Rotation about its Axis in any Situation whatſoever, it begets a round Surface, equal to a right Surface, made by the ſame *Perimeter* as a Baſe (which may be evolv'd and made a Plain Surface) whoſe height is the way or circumference deſcribed by its Center of Gravity. This by 5 *Lemma's* and 10 *Propoſitions.*

*Theſe*

Thefe being two admirable Univerfal Rules in Geometry , the Reader will find the fam
( with many others ) demonftrated by Dr. VVallis in his Trea ife De Cacu!o Cent:
Gravitatis , which together with his other Tracts , De Motu , Statica , Mechanica , are
now at the Prefs in London. The fame Rules are likewife demonftrated in Geometriæ
parte Univerfali Jacobi Gregorii Scoti , Patavii 1668. Of which a competent number of
Copies is expected here.

The Methods of thefe Learned Men are different , and good Arguments might be gi-
ven, that they have not communicated nor feen the Works of each other.

Guldinus , l. 1. c. 12. fhews a Mechanick way to find the Center of Gravity of a Sur-
face or Curv'd Line, by 2 free fufpenfions., from the points of which, perpendiculars be-
ing drawn , do crofs each other at the Center of Gravity. This we mention , to keep the
Reader from taking the Center of Gravity of a Curv'd Line as fuch ( which is intended
in this 2d Rule) to be the fame with the Center of Gravity of the Figure thereby termi-
nated in the firft Rule.

3. Confiders the Affections of Round Solids , begot from a Parabola , in 10 Propo-
fitions from Numb. 20. to 29. both inclufive ; whereof the 21 and 23 gives the Hoof
required by Angeli, which was formerly cubed by Greg. de S. Vincentio. In the 27th
Prop. he gives the Proportion of the Parabolical Conoid to the Spindle made of the fame
Parabola by rotation about its Bafe , to be , As the Bafe of the Parabola is to $\frac{16}{15}$ of the
Axis ; fhewing, that Guldinus err'd through forgetfulnefs. In Prop. 29. he delivers, that
the Parabola bears fuch a proportion to a Circle defcrib'd about the Bafe thereof as a Diame-
ter , As the Axis of the Parabola doth to that Circumference of a Circle , whofe Ra-
dius is equal to the diftance of the Center of Gravity of the Semi-Parabola from the
axis.

4. Contains divers endeavors and manifold new ways towards the obtaining the Qua-
drature of the Circle in 12 Propofitions.

5. Contains 10 Propofitions, from 41 to 51 ; in the 42th whereof he finds a Sphere e-
qual to an Hyperbolical Ring-Solid ; whence divers ways are open'd towards the attaining
the Quadrature of the Hyperbola : And he finds a Sphere equal to a Ring made by the
Rotation of a Segment of an Hyperbola , and of the Segment of a Circle thereto annexed,
defcribed about the Bafe of the Hyperbola as a Chord Line : Then he abfolutely cubes cer-
tain Hoofs cut out of an Hyperbolical Cylinder , and thence derives other ways towards the
obtaining the Quadrature of the Hyperbola.

6. Delivers 3 Theorems , fhewing the proportion between an Hyperbola and a Circle :
which are conceived to be wholly new.

But thefe Theorems fuppofe the Quadrature of both Figures known , viz. That of a
Circle , in requiring the length of the Circumference of a Circle , defcribed by the Center
of Gravity of an Hyperbola ; which Center cannot be found , without giving the Qua-
drature or Area of the Hyperbola : which hath been moft happily perform'd by M. Mer-
cator in his Logarithmo-Technia and further advanc'd by Dr. Wallis in N. 38. of thefe
Tranfactions ; and by M. Gregorii alfo further promoted and otherwife perform'd in his
Exercitationes Geometricæ , where he fhews , the fame Methods and Approaches to be
likewife applicable to the Circle.

What we have faid , being an Account of one of the moft confiderable Volumes of Ma-
thematicks extant , we hope we may be the better excufed for prolixity. This Author for-
merly publifh'd the Elements of Plain and Solid Geometry in 8° , and an Arithmetick
in 8° , wherein he promifed a Treatife of Algebra.

Errat. P. 865. l. 24. r. m P C. ; p. 866. l 3. del. finiftrorfum ; ibid. l. 18. r. Gravi-
tationem ; ib. l. 24 .r. progreffivo ; ib. l. 29. r. fit ; p. 867. l. 23. r. improprie.

☞ P. 863. Infert immediately before thefe words [ Lege fyllabas , Re-
gula. Re, Se, faciunt o R, o S : Ro, So faciunt e S, e R.

In the S A V O Y,
Printed by T. N. for John Martyn , Printer to the Royal Society , and are
to be fold at the Bell a little without Temple-Bar , 1668.