

cujusq; generis & maximos: de minimæ quantitatis Eclipsi agitur; at futura sic nec ne, judicium ex locis ad meridiem deductis fieri non poterit; sed pergendum est per præceptum sequens, ad loca vera, ipsi momento copulæ exactæ respondentia. Tunc enim latitudo cum summa semidiametrorum in judicium accersita; litem hanc cernet. Nam si illa major hac; eclipsis nulla erit: sin minor, omninò aliqua, in quacunq; parte superficiæ Terræ illa apparuerit.

EXEMPLUM ET HUIUS ET ANTECEDENTIUM ALIQUOT PRÆCEPTORUM.

Pro præcepto

137.

138.

Anno Christi 1626, sunt quaerenda Plenilunia Ecliptica. Igitur Aureus (harum Tabb.) invenitur XV. Obvatio 8. Aug. & 17. Febr. quare Plenilunium, Eclipses suspectum, aurei XI & XIX, indicant Februario nullum, quia eodem die concurrunt ☉ ☽: at bene 28. 29 Julij Iuliani. Queritur, an in nocte post diem (7 Aug. vel) 28 Julij, vel in vicinia, certo sit futura aliqua Luna Eclipsis. Locus ☉ verus in meridie est 14°. 35'. 7" Q. ☽ medius 27°. 16' Q. ☽ fictus 10°. 18'. 46" zzz. Est igitur residuum Soli intervallum ad ☽, (& sic ejus oppositio ad ☽) 12°. 41'. Luna restat ad oppositum Solis, triens saltem unius diurni, hoc est, 4. 16' circiter, & patet, Copulam sequi, eòq; Solem in ipsa Copula, propiorem fieri Nodo, circiter 20', triente unius diurni Solis. Itaq; ablatis 20', de Residuo repperito, emendatum id erit 12°. 21'. Maximus verò terminus Eclipsium Lunarium est 12°. 0'. Quod si distantia Solis à Nodo ☽, 12°. 21' esset minor quam maximus terminus, major tamen quam terminus minimus, relinqueret me in dubio, num aliqua posset esse minima Luna Eclipsis. Atq; id dubium discutiendum esset per sequentia, per quæ locus Copulæ veræ invenietur, 14°. 54' Q. Sed quia Residuum emendatum superat terminum maximum Eclipsium Luna: negat igitur omnem eclipsationem dilucidè.

PRÆCEPTUM 155.

QUOMODO COGNOSCATUR TEMPUS EXACTUM Copulæ, seu Eclipticæ, seu cujuscunq; loci que ejus in Solis & Luna Orbitis.

1. Per præc. 141 & 143.

I. COMPUTATIS ut supra, locis ☉ ☽ & ☽, ad meridiem inventum, simul excerpe diurnum Solis, cum Horario & Semidiametro Solis.

2.

2. Tunc factâ subtractione locorum, Solis veri, & Lunæ copularis seu ficti, semper antecedentis à consequente, residuum serva.

3. Per præc. 144

3. Quod si locus Solis præcesserit, ex eadem Motus ficti tabulâ, & columellis vicinis, excetpe diurnum Lunæ motum antecedentem, sin locus Lunæ præcesserit locum Solis, diurnum sequentem. Dico autem sequentem, ratione temporis: nam ratione situs in Tabulâ, diurnus, qui verè sequitur, is antecedit tunc, quando Luna est in semicirculo ascendente.

4. Constituto Lunæ diurno ficto, aufer diurnum Solis verum, ut restet diurnus Lunæ à Sole fictus, in quem divide superius residuum adservatum, sive logistice, sive per Logarithmos: Quotiens ostendet dies, horas & minuta Intervalli inter Meridiem & Copulam vel antecedentem, vel sequentem.

5. Quod si jam horarios, verum Solis, & Lunæ fictum, seorsim singulos multiplicaveris in hoc intervallum, & Quotientes à locis Solis & Lunæ prius inventis abstuleris vel addideris; vel (quod consultius est, ad detegendos errores, si qui essent commissi) computatis locis ☉ ☽ ad hanc ipsam horam; siquidem prodibit in Noviluniis locus utrobique idem, in Pleniluniis loca præcisè opposita; habebitur & tempus confirmatum, & locus Copulæ: sin aliqua existeret locorum Lunæ & Solis, vel ejus oppositi, differentia; subtracto Horario Solis, ab Horario Lunæ ficto, per residuum Horarium Lunæ à Sole fictum, differentiola illa dividatur; & per Quotientem limetur tempus.

Ut in Exemplo Præcepti antecedentis. Quia locus ☉ est 14°. 35'. 7" Q, diurnus 57°. 31', Horarius 2°. 24', Locus ☽ 10°. 18'. 46" zzz, Residuum erit iter ☽ ad ☉, 4°. 16'. 21". Et descendit Luna ab Apogeo, distans dies 9, Horas 12. Sed in Tabulâ ficta Elongationis Luna in Zodiaco, ad D. 9. H. 12. est motus — 4. 0°. 54'. 43". Et ad seqq. 10. H. 12. est motus — 4. 14'. 48'. 53".

Ergo diurnus 13. 54. 10.
Hinc ablato diurno ☉ 57. 31', restat diurnus ☽ à ☉ 12. 56. 39', per quem diviso Residuo 4. 16. 21", (ope Logg. si placet) prodit Intervallum H. 7. 55. 24', post meridiem.

Loco Solis, ut certius cognito, reducto ad Horam Copulæ, per Horarium ☉, ut sit 14°. 54'. 8" Q, locus Luna fictus (& in hoc casu Copulæ, verus) computatur ad hanc horam 14°. 52'. 39" zzz.

Cum igitur Luna absit adhuc 1. 29", aufero Horarium Solis verum 2. 24'; ab Horario Luna ficto 34. 29', restat 32. 5', Horarius fictus Lunæ à Sole; in quem divisum Intervallum 1. 29', dat tempus 2. 36'. Ergo correctum tempus Copulæ erit H. 7. 57. 55' aequalibus, post Meridiem Uranib.

Relinquitur hic adhuc indiscussa quaestio, quænam censeri debeat vera Copulatio luminarium, num ea quæ fit in circulo latitudinis, per centrum Solis ducto; an ea, quæ in circulo, per centrum Lunæ ad orbitam ejus recto; an deniq; quæ utrumq; Luminare habet æqualiter remotum à Nodo, quam consequimur quidem hac viâ, quæ Reductionem adhibet nullam; quippe generaliter præcepimus, de omnibus Copulis.

QUO COMPENDIO IN VICINIA ALTERUTRIUS COPULÆ, locus Lunæ fictus convertatur in verum.

EXQUISITO Intervallo inter loca, Solis verum, & Lunæ fictum vicinum, fiat ut Horarius Lunæ fictus ad verum, sic intervallum hoc fictum ad verum. Id autem vel logistice potest

rest fieri, si tractabiles sunt Numeri & articulati, vel per Logarithmos. Hoc igitur verum Intervallum jam loco Solis applicetur, prout prius fictum erat applicatum, & constitutus erit locus Lunæ verus.

Per in Exem- plo preced. *Sit inventus locus Solis verus 23°. 50'. 28" II, locus Lunæ fictus ex subsidiariis 22°. 54'. 28" II, cum distantia D ab Apogæo D. 12. H. 1°. 14'. quæ ex Tabulâ suâ, dat fictum Horarium 35'. 42" ex Parallaxicâ verum 37'. 58", & est ficta distan- tia D à ☉ 56', prodit ergo vera 59'. 32", quam aufer à loco ☉, fiet verus locus D 22°. 50'. 56" II.*

DIRECTORIUM, QUOMO- DO EX PRÆMISSIS COM- putandæ sint Eclipses Lunæ.

Præcep- tum 157.

Per præc. 154

Per præc. 155

Per præc. 146

Locus Re- quisitus.

Per præc. 145

Per præc. 141 143.

147. 138.

148. 145.

152. 153.

151.

POST QUAM constiterit de aliquo Plenilunio, quod id sit Eclipticum futurum, computatis sc. locis ☉ & ☽ ad meridiem proximum: postquam etiam constituta hora ipsa Copulæ, & locus Solis ad horam illam; jam per dist. ☉ ☽ reducatur locus ☉ ad Orbitam; quem appellavimus locum Requisiteum, scil. ut eum Luna occupet ad maximum defectum præstandum. Hunc locum Requisiteum comparata cum ficto loco ☽, invento sive ad meridiem, seu quod melius, ad horam Copulæ; differentiam, quæ invenietur, si majuscula, per diurnum; si parva, per Horarium, Lunæ à Sole, fictum partire, ut prodeat Intervallum; quod ad tempus inventi loci, seu meridianum id fuerit, seu Copulæ vicinius, adjiciatur, aut ab eo auferatur; prout Luna locum Requisiteum vel præcesserit vel secuta fuerit: ita habebitur tempus æquale & defectus maximi, & verum totius Eclipsationis medium. **T**unc cum intervallo ☉ ☽ correcto, arcus inter centra excerpatur: cum tempore verò ab Apogæo cuiusq; sideris, si per subsidiarias computati, aut si per ordinarias, cum Anomaliâ cœquata, excerpe Parallaxes, Semidiametros, & Horarios veros utriusque in Copulis: ex quibus forma Semidiametrum umbræ; & ex hac cum Semidiametro ☽ conjuncta, & arcu inter centra, computa Scrupulâ defectus, & converte in digitos. Quæ scrupula si fuerint pauciora scrupulis diametri Lunæ integræ, partialis defectus erit, si æqualia, totalis sine morâ; sin plura, totalis cum morâ. Computa & scrupula Durationis & Moræ dimidiæ, eaque in tempora converte. Temporibus his ablati à momento defectus maximi, iisdemque, sine mutatione, etiam detractis, apparebunt initia & defectus & moræ in tenebris (si totalis) eorundemque fines; & utriusque initii differentia, tempus Incidentiæ dicta, idemque & tempus Emerisionis; quia sunt ad omnem: hic sensus subtilitatem æqualia. Hæc omnia in Meridiano Uraniburgico, tempore æquali.

Potest etiam, minimo cum damno, negligi indagatio Copulæ, sed ipse locus Solis meridianus statim reduci ad Orbitam, & per sic reductum indagari momentum Obscurationis maximæ. Tunc correcto loco Solis, repetetur Reductio ad Orbitam, & emendabitur tempus obscurationis maximæ, si opus erit,

EXEMPLUM PLENUM ET HUIUS ET ALIQUOT ANTECEDENTIUM Præceptorum ad præsens concurrentium, Eclipsis quidem partialis.

Indagandum & computandum esto Plenilunium Eclipticum anno 4, ante hodiernam Christi æram, corrente; quia Iosephus Historicus excessum Herodis signavit tali Plenilunio proximè ante Pascha. Primum quarum hoc Plenilunium, quo cuius Mensis die contigerit. Aufero ergo 4, ab 1769, Epochâ proxima ante Christum, in Tabulâ Obviationum ☉ ☽: à residuo 1765, aufero 1748, inventos in Tabulâ Obviationum lineâ quinta, restant Anni 17: dies verò 8, ad dextram hujus quintæ lineæ stantes, addo ad diem inventum in concursu columellæ numeri 1748, & marginis numeri 17, sc. ad 27 Febr. sit dies ☉ ☽, 7 Martij. Deinde ad latus Typi Aurei Numeri, inter Capita Periodorum, anno quarto ante Christum, proximè majorem invenio 104, unde ablati hic completis 3, restant 101, & ab his ablati omnes Cycli 19, relinquunt VI Aureum, qui signat diem Obviationi proximum, in Typo Aurei 26 Febr. pro Novilunio; 13 Martij pro Plenilunio: computatis ergo locis Luminarium ☉ ☽, ad Meridiem 13 Martij ex subsidiariis: invenietur ☉ 21. 39. 28 H, diurnus 58. 42", Horarius 2. 27", Semidiameter 15. 12", Fictus ☽ 26. 8. 20 III, ☽ 17°. 0'. 9" H, Tempus ab Apogæo D. 4. H. 1°. 15'. 58", Fictus Horarius 31. 12".

Cum igr in mer. 13 Mart. sit ☉ in 20 48 11 H, & ☽ in 26. 8. 20 III; *Falsus locus ☉ Ergo falsa omnia reliqua in hec exemplo. Correctio hujus & erroris videt in præc. 154*

Superans Solem per 4. 28. 52: ergo vera Copula fuit nocte antecedente. Queritur an ea fuerit Ecliptica? Ergo cum sit terminus Lunarium Eclipsium minimus 10°. 40': hoc verò termino sit minus, Residuum inter ☽ 12°. 24'. 37" H & Solem in meridie 21°. 39'. 28" H, distant enim tantum per 9°. 14'. 51", omnino fuit Copula Ecliptica. Computetur ejus distantia à meridie, per diurnum fictum, desinentem in D. 4. H. 1, tanto enim tempore Luna inventa est ab Apogæo descendere: & in hoc tempus desinere debet diurnus, quo indigemus, quia Copula cadit ante meridiem loci Lunæ computati.

Ergo ad D. 4. H. 1. est motus — 1. 19. 24. 21 *per præc. 148*

Et ad D. 3. H. 1. est motus — 1. 7. 0. 43

Ergo fictus diurnus — 12. 23. 28

Auferatur Solis diurnus — — 58. 42

Restat fictus ☽ à ☉ — 11. 24. 46

Diurnus 11. 24. 46. L. Log. — 74407

Et est Intervallum 4. 28. 52. L. Log. — 167760

Ergo Hora 9°. 26'. 6". dantur à Log. resid. 93353

Sic momentum Copulæ ostenditur horis 14°. 33'. 54" *per præc. 153 post meridiem antecedentem Uraniburgi.*

Sed Horarius Solis verus 2. 26" ductus in 9°. 26'. 6" facit scrupula 23. 5", quibus ablati à 21°. 39'. 28" H, manet Soli locus Eclipsicos 21°. 16'. 23" H.

Et quia ☽ jam in 12°. 26' H. distantia ergo *per præc. 148* est 8°. 50'. 23", quæ dat inter centra 49'. 3", Reductionem 2. 8", quæ hic est à loco Solis subtrahenda.

henda, scilicet eundo versus nodum, qui hic ante-
cedit. Ita definitur locus Orbitæ Luna, requisitus
21°. 14'. 15" X.

Probabo hoc tempus, repetito calculo Luna, ad
Horam jam inventam. Invenitur a. 21. 14. 52" X
sum quo compara Requisite 21. 14. 15" X. Dif-
ferentiola 0. 37, qua) superavit Requisite.

Ut ergo tempus corrigatur, quia per distantiam
Lunæ ab Apogeo D. 3: H. 16, excerptus fuit fictus
horarius 31'. 2": ablato vero horario Solis 2'. 27",
restat horarius Lunæ à Sole fictus 28'. 35", qui di-
videns 0. 37" differentiam, dat tempus 1'. 16" au-
ferendum. Medium ergo, seu maxima Obscuratio,
fuit H. 14°. 32'. 38" post meridiem correctè.

Invento momento Obscuratationis maxime, per-
go ad reliqua. Ergo cum distet Luna ab Apogeo
D. 3. H. 16: erit

Parallaxis) 59'. 7".	Hor. veri) 30' 50"
Parallaxis 0. 1. 0.	0. 2. 27
Summa 60. 7) à 0. 28. 23
Auferatur Sdr Solis 15. 12	
Restat Sdr Umbra 44. 55	
Addatur Sdr Lunæ 15. 12	Logarith. 45676
Summa 60. 7	hic ex Quadrivic.
Aufer arc. inter Cent. 46. 3	

Erunt residua 14. 4 Scrupula defectus par-
tialis in parte Lunæ superiori.

Horum pars quarta 3. 31 Logarith. 192055

Ergo digiti 5°. 34'. Logarith. 146376

Antilogarithmus 15. 2900 Summa Sdd. 60. 7

Antilogarithmus 8. 9720 Arc. int. Cen. 46. 3

Antilog. Residuum 6. 2180, dat scrupula dura-
tionis dimidiæ 38'. 20", quæ divisa in Horarium
) à 0. verum 28'. 23", dant dimidiam duratio-
nem, H. 1°. 21'. 6".

Et quia obscuratio maxima est H. 14°. 32'. 38".
Initium ergo cadit H. 13°. 11'. 32". Finis
H. 15°. 53'. 44", temporibus aequalibus Urani-
burgi. In India ab Hora 15^h, ad 17^h, seu usque ad
auroram ferè. Correctionem calculi, ex eo pendet-
is tempore & magnitudine, vide in spec. pag. ult. ma

EXEMPLUM ALTERUM ECLI-
PSIS LUNÆ TOTALIS.

Anno 1616, mense Augusto, fuit Eclipsis,
quam observatorum alij totalem, alij partialem fu-
isse asseverant.

Ad meridiem diei 1^o Augusti, colligitur lo-
cus 0. 3°. 19'. 35" N, diurnus 58'. 2", horarius
2'. 25", Semidiameter 15'. 7". Sic Lunæ fictus
24°. 39'. 26" N, 86°. 40'. 30" X. Tempus ex
quo Luna Apogea fuit, D. 13, H. 17°. 22'. 38",
Diurnus) à 0. fictus 13°. 24'. 11". Et quia)
per Logg. est ante 0. Gr. 8°. 40'. 9", divisi hi per illum diur-
num) à 0, dant H. 15°. 32': & motum 0. re-
spondentem 37'. 33", ut sit ille ad horam Copula
3°. 57'. 8" N, distans 5°. 41'. 19" à 98, qui tunc
in 9°. 38'. 27" N. Ergo reductio fit 1'. 24" addenda
loco Solis, ut sit Lunæ Requisite, pro obscuratatione
maxima 3°. 58'. 37" X. Collectus vero locus) ad
hanc horam, excedit tantum 16", quod conficitur
semisse Minuti.

Comprobato loco Lunæ in ipso momento Ob-
scuratationis maxime, sequuntur reliqua.

Per distantiam 0 à 98, excerptitur
Arcus inter centra 0°. 31' 27" Antil. 4. 185 a
Per D. 13. H. 4. Paral.) 63. 39
Adde Parallaxin 0. 1. 0
Et aufer Semidiametr. 0. 15. 7

Restat Semidiam. Umbra 49. 32
Adde Semidiametrum) 16. 22

Fut Summa Semidiametr. 65. 54 Antil. 18. 375 b
Ablato ar. int. cen. restant 37. 52 Scrupula defectus
At minor est diam.) tota 32. 43

Eclipsis ergo totalis est cum mora. | ex a. b
Scrup. durationis dimidiæ 57. 55 Antil. 14. 190
Dis. Semid.) & umbra 33. 10 Antil. 4. 654 c
Scrupula moræ dimidiæ 10. 26 Antil. 0. 460

Horarius) verus 38. 22 ex a. c
Horarius 0. verus 2. 25 L. Log. 174933

Hor.) à 0. verus 35. 57 Log. Logist. 51223
Mora dimidia 17. 24 ex Log. Logist. 123710

Scr. durationis ref. 21. 58 Log. Logist. 100482
Dur. dimid. H. 1. 36. 40 ex Log. Logist. 49259

Ergo initium H. 13. 57. 8 } Aequali Uraniburgi
Init. Mora H. 15. 16. 24 } & Roma.

ga max. obs. H. 15. 33. 48 } Tempus Incident. vel
Finis Moræ H. 15. 51. 12 } Emerf. H. 1°. 19'. 16"

Finis Eclips. H. 17. 10. 28

Si Semidiameter Lunæ usurpetur major uno
minuto, ob amittum ærium: erit differentia Semi-
diametrorum 32'. 10", Antilogarithmo 4. 378.
Hinc ablato 4. 185, restat 0. 093, qui dat scrupu-
la moræ dimidiæ 4'. 42". Minuta minus quam 8'.
Ita proprius venit hic calculus Observatationi Roma-
ne, quæ moram aliquam in tenebris confirmavit,
circiter quadrantis horæ.

ECLIPSIS SOLIS, QUOMO- PRÆCEPTUM 158.
DO SIT COMPUTANDA UNI-

versaliter, in quantum scilicet pars quacun-
que Hemisphærij Telluris ad Solem conversi,
interventu Lunæ, privatur lumine Solis
vel toto vel in parte: Quodnam tunc sit
tempus Obscuratationis maxime, quæ mora
Umbra Lunæ in Disco Telluris, quæ dura-
tio Eclipsatationis omnimoda per universam
Terram, quod initium finisvè utri-
usque, tanquam Urani-
burgi.

CÆTERIS formatis vel excerptis, ut præ-
cepto priori, jam loco Umbrae terræ, for-
mandi sunt Semidiametri, Disci Terræ, & Pen-
umbrae, & Umbrae Lunæ, vel si minor Lunæ Se-
midiameter quam Solis, circuli de Solis Disco
residui. Ut igitur dimidia Mora Umbrae Lunæ in
Disco Terræ habeatur, cum hæc Umbra sit an-
gustissima, & sæpè nulla: sufficit ejus centri mo-
ram colligere; quod fit, si à Semidiametri Disci
Antilogarithmo, auferas Antilogarithmum ar-
cus inter centra; nam residuum Antilogarithmus
offert Scrupula Moræ dimidiæ, totalis Umbrae
Lunæ in Disco Terræ: quæ divisa per Horarium
verum Lunæ, diminutum Horario vero Solis,
convertuntur in Horas & Minuta. Pro Duratio-
ne vero Eclipsatationis omnimodæ, conjiciatur in
unam

per Logg.

Per pra. 149
150.

unam Summam Semidiametri utriusque luminaris & Parallaxis Lunæ, & Parallaxeos Solis dimidium; hac enim ratione conflatur Summa Semidiametrorum Disci & Penumbrae. Ex hac & arcu inter centra, similiter ut prius, elicuntur scrupula dimidiæ Durationis, eclipsationis omnimodæ per omnem Terram; quæ per verum Horarium Lunæ à Sole in horas convertitur, ut prius. Et abstractione horum temporum à tempore Obscurationis maximæ, patefcunt initia, tam omnimodæ eclipsationis, quam moræ Umbrae in Disco, quæ in suo tractu totum Solem tegit; additione verò, fines; omnibus à Meridie Uraniburgico numeratis.

Hæc subtilitas sufficere potest instituto negotio; demonstrationis verò certitudinem nondum assequitur; nisi & hoc insuper caveatur, ut arcus inter centra, priusquam adhibeatur ad investiganda scrupula Durationis & Moræ, nec non & verus Horarius Lunæ à Sole, priusquam per eum scrupula Durationis & Moræ convertantur in Horas & Minuta, quilibet seorsim dividatur per Parallaxin Lunæ, diminutam Parallaxi Solis, quotientesq; adjiciantur suis totis.

EXEMPLUM.

Extat locus Plutarchi, libro de facie Lunæ, scripto circa annum Christi 100 plus minus: in quo collocutorum unus commonescit cæteros illius Eclipsis, quæ nuper fuerit, quæ multas passim cæli stellas detexerit, statim à meridie exorsa. Examinatis multis annis circa centesimum Christi, secundum doctrinam Cap. XXIX; non occurrit versimilior anno 113, cujus die 1 Junij Uraniburgi H. 10°. 16' ante Meridiem invenitur ☉ in 8°. 30'. 17" II, (per precessionem æquabilem) Semidr 15°. 0', & ☽ in 8°. 32'. 14" II, ☽ 14°. 31' II, inter centra 0°. 33'. 8" Sept. & per ampliationem 33°. 49". Distantia ab Apogeo D. 8. H. 15. Ergo Parallaxis ☽ 61°. 50', Semidiameter 15°. 54', verus horarius 35°. 10', unde ablatas verus Solis, relinquit verum ☽ à ☉ 32°. 47', ampliata 33°. 18', Summa Parallaxeos ☽ & Semidiametrorum 1°. 32'. 44".

et dimidium Parallaxeos Solis Disci & Penumbrae 1. 33. 43. Antilogarithm. 37. 162 Differentia Semidiam. ☉ ☽, est 0°. 54': tanta fuit Semidiameter Umbrae. Ablato sesquialtero Parallaxeos ☉ 1°. 39' à Parallaxi ☽, relinquitur semidiam. Disci Terræ 60°. 21', Antilogarithmo 15. 411. Aufer ab utroq; Antilogarithmorum, arcus inter centra 33°. 18' (ut simplicius agamus, quam accuratius) Antilogarithmum 4. 692, restant Antilogarithmi scrupulorum, quibus umbra Luna moratur in Terræ disco, 50°. 20', & arcus durationis totius 1°. 25'. 26', quæ per horarium à Sole verum 32°. 47', dant moram dimidiam H. 1°. 32', durationem qualemcumq; dimidiam H. 2. 38. Mansit igitur umbra Luna in superficie Terræ ultra tres horas, & visus est Sol ex parte deficere etiam diutius, quam per unam horam antecedentem, perq; unam sequentem; & cum esset Uraniburgi hora 7°. 37' matutina (æqualis) cepit alicubi Sol ex parte deficere; Hora 8°. 43' cepit alicubi totus deficere; Hora 11°. 47' deseruit umbra Terras, Hora 12°. 53' jam post meridiem, etiam

Penumbra Terris excessit, omnis sc. corporis Lunæ particula, sese subduxit ex lineis omnibus, quæ quascumq; particulas Solis & Terræ connectere possent. Hac sic indagantur, quia locus nullus est expressus, in quo collocutores illi viderint Solem totum tectum.

Scrupula Disci Terræ, à centro Disci numerata, convertere in Arcum circuli magni Terræ, inchoatum à loco Terræ, qui Soli perpendiculariter est subjectus.

PRÆCEPTUM 159.

LOGARITHMO Logistico Scrupulorum, quæ sint inchoata à centro Disci (ut sunt scrupula latitudinis, &c.) vel adime Logarithmum semidiametri Disci, si ea minor fuerit 60' scrupulis, vel adde si major illa. Quod hoc pacto conficitur, quæsitum inter Logarithmos Heptacosiadis, ostendit sub columella arcuum, arcum circuli Magni: vel etiam inter Logarithmos Semicirculi.

h. e. Subtrahit cosific utrobisq;

Ut in Exemplo priori

Semidiam. Disci 60. 21 L. Log. — 585 privativ. Scrup. inter centr. 33. 49 L. Log. 57340

Conficitur 57925

Est igitur arcus Terræ circuli magni 34° 4'

Quantum Terræ spacium in latum extensum, umbra Lunæ involvat.

PRÆCEPTUM 160.

SCRUPULIS latitudinis, seu inter centra, & Saginæ Semidiametri Umbrae, si qua est, & addit Differentiam illam & hanc Summam converte in duos arcus circuli magni Terræ; horum differentia prodet quæsitum. Nam quilibet ejus Gradus valet 15 Milliarum Germanica.

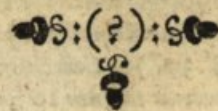
PER PARALLAX

Ut in Exemplo priori

Erant ser. lat. ampliata 33°. 49" AC Semidiam. Umbrae Luna 54 CB

Differentia Ab =	32. 55	Log. 60037
Summa Ad =	34. 43	Log. 54718
Disci 60°. 21". AB. Logarith.	— 585 priv.	
Funt ar-	Ab. 33. 3	Log. 60622
eus	Ad. 35. 7	arit. 55303

bd Eorum differentia 2°. 4' dat miliaria 31. Quod si aër supra capita nostra, latitudine 31 miliarium sit privatus lumine Solis, ut claritatem nullam faciat, poterunt utiq; stella videri. Nam si quis splendor inest aëri, qui ultra hæc 31 miliaria excurrit, is aut post montes latet, aut si aër tam altus, à regione cæli, in qua Sol spectatur, longe circumcirca recedit.



IN QVI.

h. e. ut siccepto 164
augere tanta sui portione
quanta pars e parallaxi ☉ his
parallaxeos D. e

reliqua juxta
hunc modum cor
rigenda.

INQUISITIO ALTITUDINIS GRADUS ECLIPTICÆ NONAGESIMI AB

ORIENTE.

C. Schematis antecedentis

I. In loco, cui Sol centraliter deficit in ipso gradu Nonagesimo.

PRÆCEPTUM 161.

Per præc. 159

ARCUS inter centra Disci & Penumbrae, in medio Durationis, convertatur in arcum Quadrantis. Eius igitur arcus complementum ad Quadrantem, est altitudo Nonagesimi, in medio Durationis. Quod si latitudo est borealis, Nonagesimus vergit in Austrum; si australis illa, iste declinat versus Boream. Et in loco, qui tantam admittit altitudinem Solis, in gradu Nonagesimo ab oriente Eclipticæ gradu versantis, inq; contrariam latitudini Lunæ plagam à vertice vergentis, deficit Sol centraliter.

Ut in Exemplo, scrupula latitudinaria in Disco, dabant arcum Terræ 34°. 4'. Ergo altitudo Nonagesimi in loco, ubi Sol totus deficit in Nonagesimo, fuit 55°. 56'. Et quia latitudo Borealis fuit: Nonagesimus ergo vergit à vertice loci in Austrum.

PRÆCEPTUM 162.

II. In loco, cui Sol in ipso Nonagesimo stringitur in summo vel imo margine, aut quolibet digitis ab illo margine deficit.

SI Sol debet stringi à plaga, quæ latitudinem Lunæ denominat; adde latitudinem Semidiametrum Penumbrae, eritq; Summa plagæ ejusdem. Sin Sol stringi debet ex plaga latitudinis tunc vel Semidiametrum Penumbrae; si minor sit, subtrahere à latitudine Lunæ, restabuntque scrupula latitudinis, plagæ similiter ejusdem cum latitudine totâ; vel latitudinem, si minor, à Penumbrae Semidiametro subtrahere; residua erunt scrupula plagæ contrariæ, quàm erat ipsa Lunæ latitudo: *excepto casu ultimo. ex parte*

Denique quot digitos, loco meri contactus, vis esse rectos à plaga qualibet, tot duodecimas partes de Semidiametro Penumbrae, à Summa latitudinis & Penumbrae, vel ab excessu Penumbrae, aufer; excessui verò latitudinis adde. Scrupula sic formata, si excefferint Semidiametrum Disci & Terræ; locus Phasi electæ, nullus erit in Terrâ, sed excurrat ultra fines Globi Terræ in Septentrionem vel Austrum: sin autem Scrupula pauciora fuerint Scrupulis in Semidiametro Disci Terræ, ea redige in arcum circuli Magni Terræ. Tunc iterum hujus arcus complementum ad Quadrantem, est altitudo Nonagesimi: cui adscribenda est plaga contraria ejus, quam professæ erant Scrupula latitudinis.

Per præc. 159

PRÆCEPTUM 163.

III. In loco, cui Sol centraliter deficit in ipso Ortum vel Occasum, sc. in principio & fine totalis defectus, per universam Terram.

Per præc. 161

PRIMUM quærat altitudo Nonagesimi, in loco obumbrato, in medio Durationis, cui apponatur titulus conveniens, Borealis vel

Australis. Deinde considera, num accedat Luna ad alterutrum Nodorum, an ab eo discedat. Si accedit, aufer 5°. 18', ab inventa altitudine pro principio, adde totidem pro fine: at si Luna discedit à Nodo; adde pro principio, aufer pro fine. Ita habetur altitudo Nonagesimi, competens locis, quibus Sol totus deficit, in principio Durationis totalis oriens, vel in fine illius occidens.

Quod si altitudo primò quæsitâ, fuerit major, quàm gr. 84°. 42'; peractâ additione, pro eo quod colligitur plus Quadrante, sumendum erit complementum ad Quadrantem, titulusq; seu denominatio altitudinis primò constitutæ, mutanda in contrariam.

Ut in Exemplo, cupio discere tractum, quem Umbra Luna observavit per Terræ superficiem, præsertim à principio usque ad centalem obscurationem. Et quia Altitudo Nonagesimi in ipsâ obscuratione maxima, seu media duratione, fuit inventa 55°. 56' in Austrum, Luna verò accedit ad Nodum: aufero 5°. 18', restabit 50°. 38', altitudo Nonagesimi, in loco quem Luna cum Sole oriens umbra sua ferit, terram invadens.

PRÆCEPTUM 164.

IV. In loco, cui Sol oriens à superiori & occidentali margine incipit deficere, vel occidens à superiori orientali parte desinit deficere: quorum ille defectum ab initio ad finem visurus est, iste jam vidit.

IN hoc casu à Logarithmo Logistico Scrupulorum dimidiæ Durationis omnimodæ (sed quæ ~~est~~ portione sui tantâ, quanta pars Parallaxeos Lunæ, est Parallaxis Solis) aufer Logarithmum Logisticum summæ Semidiametrorum Disci & Penumbrae, restat Logarithmus; qui vel in Heptacosiadis columna Arcuum, vel in Canone Logarithmorum Semicirculi, ostendit angulum, scrupulis Durationis oppositum in Disco Terræ. Et jam huic angulo vel subtrahere vel adde gradus 5°. 18', legibus priùs dictis: ita proveniet altitudo Nonagesimi, competens locis, in quibus Sol vel oritur incipiens eclipsari, vel occidit desinens.

Porro quod attinet titulum seu denominationem Nonagesimi: ea in hoc casu plerumque (& quando Eclipsatio potest alicubi fieri totalis, semper) est contraria denominationi latitudinis. At quando Eclipsatio minimæ quantitatis non nisi in extremis partibus ad Septentrionem vel Austrum spectari potest; fit interdum, ut angulus scrupulis Durationis oppositus, prodeat tam parvus, ut 5°. 18' subtrahi non possit. Tunc igitur vicissim subtractus ille angulus à 5°. 18', relinquet altitudinem Nonagesimi, plagæ ejusdem cum latitudine, non contrariæ.

à literis Kepleri sint constituta, per arcum (inter centra) latitudinarii auctum.

05:(0):00

PRÆ-
PTUM 165.

V. In loco cui Sol vel oriens ab inferiori & orientali margine desinit deficere, vel occidens, ab inferiori & occidentali margine incipit; sic, ut ille sit occidentalis omnibus Terræ locis, qui saltem aliquantulam partem crescentis defectus viderint oriente Sole; iste verò orientalis omnibus, quibus Sol ante finem defectus occumbit.

PRIMUM attinet casus iste tantum illas Eclipsationes, in quarum medio arcus latitudinis est minor differentiâ Semidiametrorum Disci & Penumbrae; seu cum defectus & totalis contingere potest, & ex oppositis Terræ partibus, contrariarum affectionum, ex Septentrione Australis, & simul ex Austro Septentrionalis.

Ergo à Logarithmo Logistico Scrupulorum dimidiæ Moræ Penumbrae in Disco, aufer Logarithmum Logisticum differentiæ Semidiametrorum Disci & Penumbrae, restat Logarithmus Anguli, scrupulis Moræ oppositi, excerpti vel ex columnâ Arcuum in Heptacoside, vel ex Canone Logarithmorum Semicirculi. Rursum iijitur huic Angulo ablati vel additi $5^{\circ} 18'$, formatur altitudo Nonagesimi in locis ad orientem & occidentem, extremis omnium eorum, quæ saltem aliquam particulam de eclipsatione tali vident. Et obtinet Nonagesimus in hoc casu semper plagam latitudini Lunæ contrariam.

DE LOCIS IN TERRA, QUIBUS OBVENIUNT PHASES
PRÆCIPUÆ IN ECLIPSI
SOLIS.

PRÆ-
PTUM 166.

Quomodo indagetur latitudo loci, quæ cujusque gradus Nonagesimi propositam altitudinem representet.

PRIMUM ex datâ Phasi, in hac quidem universalis consideratione Eclipsis Solis, facile habetur gradus oriens. Nam in medio durationis universalis, ipse gradus Solis, est Nonagesimus ab ortu retrò; in triplici initio apparentis Eclipsæ, Solis gradus ipse oritur.

Ergo pro initiis cum ipso loco Eclipsis; pro medio, cum loco ejus quadrato sequenti; pro finibus, cum loco Eclipsis opposito, ingredi Tabulam Anguli Orientis, quærendo signum & gradum in margine sinistro vel dextro; & percurra totâ lineâ, filisque omnium altitudinum Poli Septentrionalis; in cujus filo seu columellâ inveneris altitudinem Nonagesimi, inventam per præcepta præcedentia, cum sua denominatione; illa altitudo Poli in fronte & calce posita, est quæ sita latitudo Loci Septentrionalis.

Tabb. f. 16.

Sin autem hæc altitudo Nonagesimi, cum sua denominatione propositâ, non invenitur in tota linea, per omnes Tabulæ paginas: id argumento est, elevari Polum Antarcticum: cujus altitudo quærenda tunc erit per gradum orienti gradui oppositum, & per altitudinem Nonagesimi eandem quidem quantitate; sed denominationis jam contrariæ.

A fol. 26. in
31.

In Exemplo nostro, sit quærenda latitudo Loci, in qua locus ipse Eclipsis $8\frac{1}{2}^{\circ} \text{II}$, sit Nonagesimus ab ortu, habens altitudinem $55^{\circ} 56'$. Oritur ergo $8\frac{1}{2}^{\circ} \text{III}$. Et altitudo Nonagesimi $55^{\circ} 56'$, quæ sita in lineâ 9°III , tandem sub altitudine Poli Septentrionalis 55° invenitur proximè. Est ergo latitudo loci, dans hanc Altitudinem Nonagesimi, 55° .

Tabb. fol. 29

Rursum queritur, quæ sit latitudo loci, in quo, Sole oriente, Nonagesimus retrò, id est, $8\frac{1}{2}^{\circ} \text{X}$, elevetur gradibus $50^{\circ} 38'$, quæ fuit inventa altitudo hujus Nonagesimi, competens totali obscurationi. Igitur altitudo Nonagesimi $50^{\circ} 38'$, quæ sita in lineâ $8\frac{1}{2}^{\circ} \text{II}$, tandem sub altitudine Poli Borealis 28° invenitur.

Præcept. 163

Ergo loci, cui Sol oritur totus à Lunâ reclus (sen centraliter) latitudo est 28°gr .

Qua ratione indagetur longitudo loci in Terra, in qua contingit unaquæque phasis, de Eclipsi Solis universaliter consideratâ, hoc est, initialis, media, vel finalis: ad tractum considerandum, per quem incedit umbra

PRÆ-
PTUM 167:

Lunæ.

SI elevatur Polus Arcticus: sub inventa Poli altitudine, sub qua contingit quæque phasis, quæro ascensionem obliquam gradus orientis, à quâ demptis 90° gradibus, restabit Ascensio recta Medii Cæli in loco, cujus longitudo est quærenda.

Per præc. 166
Per C. XIV.
Præc. 43. 44.

Sin autem Antarcticus Polus elevatur, quære sub inventa ejus altitudine, Ascensionem obliquam gradus occidentis, ac si is oreretur, eiq; non adime, sed adde, 90°gr . qua ratione rursum conficitur Ascensio recta Medii Cæli in loco, cujus longitudo est quærenda.

Quod si jam quæritur aliqua Phasium in durationis, per universam Terram, medio: subordina illi Phasi Ascensionem rectam Medii Cæli, quæ illi competit in Meridiano Uraniburgico: sin autem de iis locis agitur, quæ centram eclipsationem vident in ortu & principio; vel in occasu & fine, utere Ascensione Recta Uraniburgica; quæ fuerit ad principium durationis universalis, Eclipsæ totalis vel ad ejus finem. Rursum si quæritur de iis locis, quibus Sol oriens tangitur, videndus toto tempore defectus, vel occidens tangitur, postquam spectatus est totus defectus: utere Ascensione recta Uraniburgica, quæ fuerit illic ad principium durationis universalis omnimodæ, hic ad finem ejus.

Deni-

Denique si indagantur extremitates locorum, quæ aliquid vel minimum de Eclipsi vident post Solis ortum, vel ante ejus occasum: subscribenda erit illa Ascensio recta Medii Cœli Uraniburgici, quæ fuit vel in principio Moræ Penumbrae (non umbræ) in Disco, vel in ejus fine.

Hoc pacto subordinatarum Ascensionum Rectarum, præcedentem subtrahe à sequenti, additis 360 si opus fuerit: ita relinquetur differentia Longitudinis inter Uraniburgum & locum quæsitum; in ortum quidem extensa, si Uraniburgica præcesserit, in occasum verò, si secuta fuerit.

Hanc igitur differentiam converte in horas, quas si quæsieris in Mappa Mundi, ostendetur Meridianus loci inquisiti.

Ut, in Exemplo, ut sciatur longitudo loci, in quo Sol tegitur centraliter in ipso Nonagesimo: quia tempus, quo fit appositio Luminarium centralis (efficiens obscurationem maximam) numeratur in Meridiano Uraniburgico $H 22^{\circ} 15' 24''$ equali (etsi apparente fuit utendum, si esset in hac subtilitate pretium opera) & Ascensio recta Solis est $66^{\circ} 45' 20''$; adde hanc ad tempus in Equatoria Tempora conversum, $333^{\circ} 51'$: fit Ascensio recta Med. Cœli Uraniburgici quidem $40^{\circ} 36' 20''$. At vero sub altitudine Poli 55° , oriente $8\frac{1}{2}^{\circ}$ N. est Ascensio obliqua $147^{\circ} 57'$, & ablatis 90° (quia Polus Boreus elevatur) Ascensio recta Medij Cœli $57^{\circ} 57'$. Differentia ergo ab Uraniburgica est $17^{\circ} 20' 40''$, quæ valet Horas $1^{\circ} 9'$: tantum locus, in quo Sol defecit centraliter in ipso Nonagesimo, fuit orientior Uraniburgo.

Rursum, pro loco Terrarum, quem primum Umbra Lunæ sibi Sole oriente, quia hoc factum esse colligitur Hora Uraniburgica $20^{\circ} 46'$, id est, Temporibus Equatoris $311^{\circ} 30'$: adde Ascensionem rectam Solis $66^{\circ} 42'$: conflatur Ascensio recta Medij Cœli Uraniburgi $18^{\circ} 12'$. At sub altitudine Poli Borei 28 , quæ pro hac phasi prius inventa est, oriente $8\frac{1}{2}^{\circ}$ N., est Ascensio obliqua $54^{\circ} 42'$: est ergo ibidem Ascensio recta Medij cœli $324^{\circ} 42'$: præcedit igitur illa hanc, distans ab ea $53^{\circ} 30'$, quæ sunt Horæ $3^{\circ} 34'$. Tantum igitur locus Uraniburgo absit in Occidentem.

Terminis inquisitis, etiam linea terminos connectens, in conspectum venit. Umbra, inquam, Lunæ, quæ causa est occultationis Solis totalis, initio facta ab Oceano Atlantico, mediam Europam transivit, & emensa Germaniam, in Lithuania, Solis, in ipso Nonagesimo collocati, lumen extinxit.

Plutarchus verò, sive Chæronæ fuit, sive Athenis, ut videtur, sive alibi in Græciâ, Solem totum tectum videre non potuit, hujus quidem calculi indicio: at benè, si Luna paulò maturius ad Solem venisset, angulo orientis minore. Aut dic, quærendam esse Eclipsin, cujus mentionem Plutarchus fecit, vel ante annum Christi 93, vel post annum 120: siquidem author omnino de totali Solis defectu est accipiendus.

Quantum habent hoc etiam partialium Solis Eclipsium illæ, in quibus Luna paulò superior Sole videtur, præ cæteris, in quibus Lu-

na inferior: quod umbra Lunæ infusa in vastos aëris ætherisque campos, qui proximè supra verticem sunt, lumen horum secundarium extinguitur, ut claritudinem ad terram demittere non possint: cum vicissim cornu illud Solis tenuæ, quod prominet inferius, non nisi humiles aëris partes illuminet.

Quo ordine consequantur se in vicem loca in superficie Terræ, quibus singula Phases apparent.

P R I M ù M igitur sentiunt minimam aliquam Solis orientis Eclipsin decrecentem, sic ut Sol simul oriatur, simul deficere desinat, omnium Terræ locorum occidentalissimi: hos sequuntur in orientem, qui Solem centraliter tectum oriri vident: his iterum sunt orientiores, quibus Sol oriens incipit eclipsari, videndus ad usque finem defectus. Multò his sunt orientiores, quibus Sol in ipso Nonagesimo tectus apparet: & eodem ferè intervallo orientiores, quibus Sol ab initio ad finem deficiens spectatur, sic ut in ipso fine occidat: minori verò intervallo sequuntur versus ortum, qui Solem centraliter tectum vident occumbere; omnium verò terræ locorum orientalissimi sunt, qui de Solis defectu incipiente, quàm minimum in occasu vident; sic ut simul incipiat deficere, simul occidat.

Hac itaque ratione, spacia terrarum exquisita, per longum tempus durationis omnimodæ, distant inter se versus ortum & occasum multò minùs, quàm spacia terrarum, per durationis totalis tempus mediocre; & his iterum longius inter se distant, loca per breve tempus, Moræ Penumbrae in Disco, exquisita: ut quo diutius abest finis quilibet ab initio sui generis, hoc brevius inter se distent loca.

At in Eclipsibus his, in quibus Penumbra excedit meras Orbis Terrarum, locorum illorum terræ duorum extremorum definitio, magnam habet varietatem: excurrunt enim illa sub circulum terræ Arcticum vel Antarcticum: et si Septentrionalis fiat Eclipsis in signis Septentrionalibus, vel Australis in Australibus, potest totus Polaris Arcticus vel Antarcticus, & omnia loca illi subjecta, frui conspectu Eclipsis aliquantulæ.

Si verò Eclipsis & signum Zodiaci, permutatas habeant plagas, loca hæc duo sub polari circulo minimum inter se distabunt. Utrobique fiet permutatio Phasium quarundam, ordinisque locorum sub Polari, causa longitudinis: Itaque definitio illorum duorum inutilis & injucunda est.

Illud tamen expedit scire, si inventus est locus, in quo Sol in ipso ortu centraliter tegitur; sub eodem parallelo longius in occidentem videri aliquem partialem defectum decrecentem, sic ut in eo reperiat locus aliquis, in quo Sol simul oriatur, simul desinat deficere.

*Causa ten-
bræ dicitur
non in E-
clipse Solis.*

*Primum accipienda est
non de tempore Uraniburgico,
sed de ordine locorum ab occasu
in ortum. ex. part.*

*line locorum ab
h. ortu versus.*

Tractus
Umbra.

Præcept. 169. tollenda etc. Xvix in verbis Casq. auge partibus proportionalibus, ut que tantummodo tunc tolerent, cum Eclipses contingant magna, & non procul ab initio & sine argumentamur ad medium. Hæc Kepler

At id non fit in aliquo præcipuorum articulo-
 tum temporis, sed intermedio, inter ingressum
 centri Penumbrae & Immerfionem totalem.
 Eodem modo, si sit inventus locus, in quo Sol in
 ipso occasu centraliter tegitur: tunc sub eodem
 parallelo longius in Orientem videbitur aliqua
 particula de defectu crescenti, ante occasum So-
 lis: itaque reperietur locus aliquis sub eo, in
 quo Sol simul incipiat deficere, simul occidat;
 idq; momento aliquo intermedio inter Emer-
 sionis initium, & egressum centri Penumbrae.

Lunæ, easque auge partibus proportionalibus
 de horario Solis intermedio. Quare etiam di-
 stantiam utriusque situs Lunæ visibilis. Ita con-
 stituetur Triangulum rectilineum, inter duos
 situs Centri Lunæ, & inter punctum medium
 duorum situum centri Solis. Jam si ex hoc pun-
 cto, in distantiam duorum Lunæ situum visibi-
 lium, ducatur perpendicularis (quæ unâ cum
 partibus illius distantia, quas constituit, inve-
 stiganda est) tunc hæc perpendicularis, erit di-
 stantia centrorum, tempore Obscurationis ma-
 ximæ: partium verò illa, quæ Antecessioni Lu-
 næ respondet, scrupula habebit, quibus ante-
 cedens Lunæ situs, distat à puncto Obscurati-
 onis Maximæ, & quæ Superationi, scrupula, qui-
 bus sequens.

Per præc. 168

Vsus proprius præcepti 30. p. 25

DE CALCULO ECLIPSIS
 SOLIS AD CERTUM AL-
 QUEM LOCUM.

Datis duabus distantis Lunæ à Sole vi-
 sibilibus in Eclipticâ, vicinis invicem,
 unâ antecedente, altera superante So-
 lem, & utriusque latitudine visi-
 bili, querere distantiam situs
 utriusque.

PRÆ-
 ceptum 168.

SI latitudines diversæ, fac Summam; sin plagæ
 ejusdem, differentiam; & illius vel hujus
 Antilogarithmum adde Antilogarithmo Sum-
 mæ distantiarum à Sole in Eclipticâ, quæ sit aucta
 motu Solis horario competenti; conficitur An-
 tilogarithmus quæsitæ distantia, in circulo ad
 Eclipticam obliquo. Necessarium est Præcep-
 tum ad Eclipses Solis nonnullas subtiliter com-
 putandas.

Per præc. 29.
 p. 25.

Datis duabus distantis Eclipticis Lu-
 næ à Centro Solis, una antè, altera post,
 & utrobique latitudine Lunæ, invenire
 Scrupula distantia Lunæ à puncto,
 in quo fit obscuratio maxima,
 & in eo puncto distan-
 tiam Centrorum.

PRÆ-
 ceptum 169.

SOLENT Eclipses Solis in Ephemeridibus
 computari secundum Præceptiones Prute-
 nicarum, suffultas & rexyia illa, quam tradidit
 Ptolemæus; quæ ponit, angulum Orbitæ Lunæ
 cum Eclipticâ, manere constantem, etiam in vi-
 sibilitinere. At demonstravi ego in Astrono-
 miæ parte Opticâ, repetiique in Epitomâ, mag-
 nam esse hujus anguli varietatem ex parallaxibus
 latitudinis.

Epis. Astr.
 fol. 387.

Quare quoties contingit insignem esse mag-
 nitudinem, vel summæ latitudinum visarum
 Lunæ, si plagæ erunt diversæ in duobus sitibus
 Lunæ, vel differentia earum, si plagæ ejusdem;
 oportebit omninò Triangulum rectilineum dis-
 solvere. Id verò sic fiet, quàm fieri potest, levis-
 simâ cum operâ, Tabulâ nostrâ Antilogarith-
 morum adminiculante.

Tabb. fol. 23

Ex datis, quare utramque distantiam Cen-
 trorum, Solis & Lunæ, in utroque scilicet situ

p. 25
 p. 100

Per præc. 29.
 vel 152.

Sit ad horam meridianam equalem Urani-
 burgicam inventus locus \odot verus $16^{\circ} 48' 27''$ λ .
 \odot visibilis ad Eclipticam reductus $17^{\circ} 7' 58''$ λ .
 intervallum seu Superatio Lunæ $19' 31''$. Ante
 duas verò horas, Sole interim per $5'$ promotus, sit in-
 ventus locus Lunæ visibilis, $16^{\circ} 14' 39''$ λ : Inter-
 vallum seu Antecessio Lunæ $28' 48''$. Latitudo
 illic, tempore posteriori, visa sit $15' 57''$. Septen-
 trionalis; hic, tempore priore $1' 11''$ etiam Sep-
 tentrionalis.

Primum itaq; quæro distantias Cen-
 trorum Solis & Lunæ.

Latitudo visa	15.57	Antilog.	1.077
Superatio	19.31	Antilog.	1.612
Distant. cent.		25' 13"	Summa 2.689
Latitudo visa	1.11	Antilog.	0.006
Antecessio	28.48	Antilog.	3.509
Distant. cent.		28' 50"	Summa 3.515

Per præc. 29. p. 25
 vel 152. p. 100

Inter hos duos arcus distribuo scr. $5'$ motus So-
 lis proportionaliter, addens illic $2' 20''$, hic $2' 40''$
 circiter; sicutque latera Trianguli, $27' 33''$, &
 $31' 30''$.

Secundò, quæro distantiam duorum
 Lunæ situum.

Superatio	19.31	Ejus latit.	15.57 septent.
Antecessio	28.48	Ejus latit.	1.11 septent.
Summa		48.19	Different. 14.46 qd simi
Addito motu Solis $5' 0''$, sit differentia longi- tudinis		53.19	Antilog. 12.017
Diff. latit.		14.46	Antilog. 0.923

Per præc. 168

Summa ut Antilogarithmus 12.940 das
 distantiam situum $55' 18''$.

Tertio ut in Triangulo, cujus duorum laterum
 $27' 33''$, & $31' 30''$ Antilogarithmi sunt 3.211,
 & 4.198, tertium latus $55' 18''$, ut inquam
 inveniatur perpendicularis, ex illorum laterum
 angulo in hoc, & partes hujus, à perpendiculari
 factæ: ab Antilogarithmo 4.198, ut duorum ma-
 jori, aufero aliquem minorem in tabulâ, & esto is,
 scr. $30' 0''$, scilicet 3.807, ut sit residuum 0.391:
 & ille arcus ablatas à latere secundo, relinquit
 $25' 18''$. Cujus Antilogarithmus est 2.708: sub-
 tractus hic à 3.211, ut duorum minori, relinquit
 0.503. Summa horum residuorum est 0.898, cu-
 jus semissis 0.449, qui debebat esse 0.395. Major
 igitur

igitur aliquis erit initio auferendus à 4.198: scilicet subtrahito inde hoc semisse, residuus erit 3.749, cuius arcus 29'.46"; tunc pars de 55'.18" reliqua erit 25'.32"; cuius Antilogarithmus 2.758. Hic rursus à 3.211 ablatas, relinquit 0.453: & hoc cum priori semisse 0.449 proximè convenit. Inuentus igitur est Antilogarithmus perpendiculari 10'.20" & pars lineæ quæ respondet Antecessioni, verè est 29'.46", pars quæ Superationi, 25'.32".

Processus post prima tentamenta facilimus erit.

Eclipsis Solis initium, Finis, Quantitas &c: quomodo sint computanda ad certum aliquem Locum.

Præcept
170.

1. PRIMUM aut nescitur Hora Eclipsis, aut scitur præterpropter. Si nescitur hora, tunc nihil prius est faciendum, quam ut computetur tempus exactum Copulæ, cum locis ☉, ☽, & ♀ in Eclipticâ, & depromantur Parallaxes ☉ & ☽, cum Semidiamentris & Horariis veris. Si verò præcitur Hora præterpropter, tunc ad illâ computetur loc⁹ Lunæ fictus, & reducatur ad verum, computentur & loca ☉ & ♀, ad idem momentum. Nam exactâ cognitione ipsius veræ Copulæ non simpliciter est opus, potestq; parci operæ, per se satis operosæ in cæteris. Depromantur verò etiam hoc casu parallaxes & Semidiamentri ut prius.

Per præc. 155.

141.

143.

Per præc. 143.

156.

Per præc. 141.

143.

141.

143.

2. Secundò cum distantia non Solis, sed Lunæ ipsius à Nodo, excerpatur ex Tabulâ latit. Ecclip: Reductio. Illa verò jam in hac computatione ad certum locum Terræ, non est extendenda à loco Solis, ut prius, cum de omnimodâ Eclipsatione Terræ ageretur, sed à loco Lunæ versus Nodum, ut habeatur locus Lunæ reductus ad Eclipticam.

Per præc. 146.

p. 99.

3. Tertio eodem ingressu Tabulæ excerptur etiam latitudo, cum suâ plagâ.

145.

4. Quarto tempus æquale Uraniburgicum, momenti, ad quod loca sunt computata, conuertatur in apparens, & reducatur ad Meridianum loci; tunc ad hoc exquirantur Parallaxes Longitudinis & Latitudinis. Parallaxes autem dico, non Lunæ simplices, ut capite XXVIII, sed diminutas parallaxi Solis, quæ dicuntur Parallaxes Lunæ à Sole. Et cum his parallaxibus, locus Lunæ verus, ad Eclipticam reductus, veraq; Latitudo ejus, conuertantur in visibiles. Et subtractione factâ loci ☉, à loco Lunæ visibili, si hic superaverit, vel hujus, si antecesserit, ab illo, intervalla Longitudinis & Latitudinis adserventur; cum titulis vel Antecessionis Lunæ vel Superationis.

Per præc. 49.

vel 51. 52.

54. vel 53. 54.

Per præc. 55.

Per præc. 133.

5. Quintò. Quod si nulla fuerit Longitudinum differentia, jam ferè habes momentū Obscurationis maximæ, & calcul⁹ eò est perductus, ut ad quantitatis Eclipsos inquisitionem progredi possis; ad initij verò & finis collectionem superest aliquid etiam tunc operæ. Repetendus enim erit calculus & ad antecedentem, & ad sequentem Horam. Nisi fortè punctis æquinoctialibus aut vicinis gradibus, orientibus, angulus Orientis per bihorium parum mutetur; tunc al-

terutrâ saltem repetitione erit opus. At si fuerit aliqua longitudinum ☉ & ☽ visibilis differentia, siquidem Luna antecesserit, adde ad tempus apparens horas summum duas, ad locum verum in Ecliptica veros Horarios Lunæ à Sole duos; sin Luna superaverit, subtrahæ hæc: Distantiæ verò Lunæ à Nodo priori, adde vel aufer, pro re natâ, Horarios Lunæ veros integros duos, latitudinemq; de novo excerpe. Ad tempus sic mutatum, repete processum parallaxium Lunæ à ☉, rursusq; per eas veram Lunæ longitudinem (respectu quidem Solis, interim immobilis suppositi) & latitudinem reduc ad visibiles, & differentiam à loco Solis initio computato exquirere, ut prius.

namur gradum Ligni habuerit

Sextò junctis jam duabus Luminarium distantis visibilibus, si modò altera sit Antecessionis, altera Superationis Lunæ, (secus enim si esset, utendum esset subtractione) sic emergit motus Lunæ à Sole visibilis, unius vel duarum Horarum. Additis etiam latitudinibus visibilibus, si diversarum fuerint plagarum, vel subtractâ minore à majore ejusdem plagæ, habetur & latitudinis visibilis mutatio ad unâ vel duas Horas. Quòd si latitudinis mutatio fuerit nulla, ut contingere potest, vel exigua: per Horarium visibilem ☽ à ☉, & præcessionem visibilem ☽, facile inquiritur temporis intervallum, quanto posterius contigerit obscuratio maxima, quam est id, ad quod est inventa præcessio Lunæ visibilis: & per latitudinem visibilem utrinq; eandem, computatur etiam Quantitas Obscurationis maximæ; aut si nonnihil inæquales, per latitudinem ergò intermediam, proportionaliter tempori Antecessionis vel auctam vel diminutam. Deniq; & locus Solis in Eclipticâ exactus, determinabitur per horarium ejus in tempus ductum, & quotientem loco Solis primò computato adjectum.

6.

Sin autem fuerit aliqua latitudinum visibilium inæqualium, insignis vel Summa vel Differentia; ne igitur tunc varietatem hanc satis notabilem, & in diminuendâ luce diei in Eclipsibus magnis, momenti non parvi, ne hanc inquam transeamus obiter: inquirenda erit, tam distantia duorum situum, quam ejus pars seu Scrupula residua, usq; ad Obscurationis maximæ locum, & distantia in eâ centrorum. Rursus igitur cum distantia duorum Lunæ situum, tanquam cum unius vel duarum horarum motu visibili Lunæ ipsius (non ☽ à ☉) & cum ejus parte, quæ Antecessioni Lunæ respondet, indagabitur temporis intervallum, ab illo momento, quo Luna antecedere inventa est, ad obscurationem maximam.

Tempus.

Quantitas defectus.

Locus Eclipsis.

Per præc. 168.

Per præc. 169.

Tempus.

Quantitas defectus.

Secundum præceptum

152. 153. p. 100.

Quantitas verò defectus, per Semidiamentros Luminarium & distantiam hanc visibilem centrorum inveniatur.

Excipe cum Diameter Solis superat diametrum Lunæ; quod fit, illo in Perigæo, hac in Apogæo versante; tunc enim, quando distantia centrorum, est minor differentia Semidiamentrorum, semper circulus manet lucidus; latitudine in medietatibus tantâ, quanta est illa differentia Semidiamentrorum.

Per præc. 150.

Denique per hanc centrorum distantiam visibilem in momento Obscurationis maximæ

Duratio.

Secundum
prac. 151.

Initium &
finis.

Plan de hoc
vide in præf.

& per Summam Semidiametrorum Solis & Lunæ, Scrupula dimidiæ Durationis quaruntur, eaque per Horarium jam D à \odot visibilem, seu in Ecliptica, seu in via obliqua, convertitur in tempus: atq; id additum & ablatum à momento Obscurationis maximæ, prædit initium & finem deliqui, præterpropter.

Potest autem locus Lunæ visibilis ad hæc tria momenta, sic definita, certitudinis causâ rursus computari: & in illo, Quantitas defectus; in istis, initium & finis corrigi, si non nihil discrepare deprehendantur à prius inventis. Nam Parallaxes sæpè turbant rectitudinem & æqualitatem motus Lunæ visibilis. *Avo loco scilicet erit usus præcepti: 29*

EXEMPLUM ECLIPSIS SOLARIS ad certum Locum computandæ.

ERASMUS REINHOLDUS præfatione in Theorias Purbachij ex Scriptore turbarum Bohemicarum Polono, meminit Eclipsis Solis Anno 1415. die 6 Junij, Hora 18, cum sint vise Stelle ut noctu, & aves subitâ caligine territæ, passim è sublimi in terram deciderint.

Cum ergo apponat Historicus tempestatem diei: computata ad Horam 18, æqualem P. M. Uraniburgicum, ex subsidiarijs, loca sic inveniuntur. $\odot 23.50.28 \text{ II. } \text{D} 22.54.28 \text{ II. } \text{Q} 1^{\circ}.9'.0 \text{ Q.}$ Parallaxis $\odot 0'.59''$. Semidiameter $15'.0''$.

Quia ergo D non abest integro gradu à \odot , scilicet, Scrupula 56, pergam rectâ ad locum ejus visibilem, dimisso momento Copule veræ. Nam distantia D ab Apogeo D , 12. H. 1. dat Parallaxin $63'.26''$ Semidiametrum $16'.18''$. Horarium $37'.55''$. Et quia locus Lunæ iste fictus tantum est, quippe adhuc extra Copulas; reducâ eum ad verum, qui erit

Per præc. 156

2.

3.

$22^{\circ}.50'.59'' \text{ II.}$ Locus Q , $1.9.6 \text{ Q.}$ Distantia $8^{\circ}.18'.7''$. dat latitudinem $0'.45'.51''$. Borealem. Reductio $2'.8''$ addenda loco Lunæ, ut versus Nodum sequentem: ita fiet $22^{\circ}.53'.7'' \text{ II}$ locus Lunæ ad Eclipticam reductus.

4.

Cum ergo computâ verimus ad Hor. 18. æqualem; \odot in 24 II dat equationem temporis TychoNICAM $2'.12''$ Subtr. ab apparente; ergo addendam ad æquale, ut fiat $H 18^{\circ}.2'.12''$. Et propter reductionem ad Meridianum Pragensem, adduntur 5. quia locus orientior. Ita tempus reductum ad Meridianum, est $H. 18.7.12''$.

Ad hoc igitur tempus exquisite parallaxes D à \odot , per Asc. Obliq. $85^{\circ}.2'$, reperiuntur, Long. $37'.38''$. Lat. $45'.18''$. Ita manet latit. visa Bor: $0'.33''$, Long. $23^{\circ}.30'.45'' \text{ II}$, in Eclipt. ut antecedit Luna Solem sc. $19'.43''$ visibiliter.

5.

Addam ergo in secundâ computatione temporis Horas 2, & loco Lunæ Ecliptico vero duos Horarios veros D à \odot , id est, $1^{\circ}.11'.4''$: ut sit locus Lunæ $24^{\circ}.4'.11'' \text{ II}$, respectu quidem prioris loci Solis, quasi is in eodè loco inierim hæserit. Distantia verò à Nodo $8^{\circ}.18'.7''$. admo horarios veros duos ab æquinoctio, id est $1^{\circ}.15'.50''$: quia hic posteriori tempore, D est vicinior nodo: erit distantia à Nodo $7^{\circ}.2'.17''$, dans latitudinem veram $0'.38'.53''$. Cum ergo prius fuerit Asc. Obliqua Orientis gradus, $85^{\circ}.2'.15''$: post duas horas fuit $115^{\circ}.2'$; & com-

putatur Parallaxis lat. $37'.12''$. Long. $32.34''$, & visus Locus D $24^{\circ}.36'.45'' \text{ II}$, siquidem \odot hæssisset in eadè suo loco. Superatio ergo $46'.17''$; quæ juncta priori Antecessioni, dat visibilem motum, bihorij $66'$.

Medium Obscurationis.

Visa Latitudo sit $1'.42''$. Sept. propemodum eadem: itaq; facile obscurationis maxima momentum habetur. Nam si visibilis horarius $33'.0$ dat Horam unam: Antecessioni $19'.45''$ dabunt $35'.51''$.

Locus Eclipsis.

Fuit igitur medium Hora $18^{\circ}.43'.3''$ apparenti Praga, & Horarius Solis $2'.23''$, multiplicatus in tempus $36'$, dat $0'.56''$. Itaq; locus Eclipsationis exactus est $23^{\circ}.51'.25'' \text{ II}$. Rursum si horis 2 mutatur visa latitudo per $19''$, & Hora una per $35''$, ergo minutis $36'$ debentur $21''$. In medio ergo Eclipsis est latitudo visa $0'.54''$, quæ ablata à Summâ Semidiametr. $31.18''$, restant Scrupula defectus $30.24''$, cum Diameter Solis habuerit tantum, sc. $30'$. Defectus igitur totalis fuit Praga: & tenebra tantò majores, quòd Centrum Luna paulo altius centro Solis transire visum, claritatem Aeris vel Ætheris super Germaniam fusi, (multorum miliarium altitudinem & latitudinem occupante diametro Umbra) penitus extinxit.

Quantitas defectus

Summa semidd. $31.18''$, & distantia Centro-rum in Medio, $0'.54''$. efficiunt Scrupula dimidiæ durationis $31'.17''$: quibus divisus per $33'$ Horarij visibilem: dimidia duratio fit $56'.54''$. Itaq; quamvis Eclipsis totalis erat: quia tamen a Nonagesimo multum distabat, ubi Parallaxis motum visibilem non multum retardat, & quia Luna velox; Eclipsis non potuit durare horas duas. Incepit igitur Praga Hor: $17^{\circ}.46'$ post Merid. antecedentem, desijt hora $19^{\circ}.40'$ apparenti.

Initium & Finis.

Computer, qui habet otium, ad hæc tria momenta; deductisq; parallaxibus, loca visibilia constituat, & distantias centrorum exquirat, ut tempora & quantitas, si opus est, corrigantur.

EXEMPLUM ALIUD.

Anno Christi 1598. die (7 Martij vel) 25 Febr. Solis Eclipsis observata fuit Gratijs Styria, Uraniburgi & in Iulia, Regni Dania Provincia, Observationes à me sunt relatæ ante annos 21 in Eius fol. 385 Astronomia parte Opticâ. Ergo ad Meridiem 390° . & æquale, Uranib. computam. $\odot 10^{\circ}.48'.27'' \text{ X}$

1.

$\text{D} 17^{\circ}.32'.26'' \text{ X. } \text{Q} 6^{\circ}.58'' \text{ X.}$
Horarij $\odot 2.30$, D Fictus 34.45 , verus 36.24
Semidia $\odot 15.21$ $\text{D} 16.6$
Parallaxis $1.0''$ $\text{D} 62.35$

2.

Cum ergo fictus Luna locus superaverit Solem Scrup. $43.59'$: erit ut fictus $34.45''$, ad veri excessum $1.39'$: sic $43.59'$. ad $2'.5''$. Tanto spacio est augendum intervallum fictum, ut Luna verè sit in $17^{\circ}.34'.32'' \text{ X}$, distans à Nodo, $10^{\circ}.36'.33''$: qui arcus dat latitudinem $8.29'$, Reductionem $2.39'$: tanto propior Nodo est locus Lunæ Eclipticus, scilicet in $17^{\circ}.31'.53'' \text{ X}$.

3.

4.

Iam Sole in 17° . X versante, Tycho jubet addere $4.15''$. ad apparens, subtrahere ab equali. Vicissim differentia Meridianorum Gratijs addit jubente Catalogo. 14, sed ante emendatum Catalogum solutus sum addere $17'.20''$; quorsum etiamnum propendet animus: ita fiet Tempus $H. 0^{\circ}.13'.5''$. Sed hac vice addo alia $18'.56''$, propter Præceptum sequens:

Vide cap. XVI. fol. 38.

quens: ut sit apparens $H. 0^{\circ}. 32'$, & $Afc. 0.85^{\circ}. 52'$, dans Parallax. Long. Δ à \odot in occasum $23^{\circ}. 55''$, Lat. $42^{\circ}. 33''$: ut sit visus locus Δ $17^{\circ}. 7'. 58''$ \times , visâ lat. $15^{\circ}. 57'$ Sept.

Cum ergo Luna motu visibili deprehendatur superasse Solem per $19\frac{1}{2}$ intervallo non longo: pro secunda computatione eligatur bitorium antecedens. Ablato vero Δ à \odot $1^{\circ}. 7'. 48''$, à loco vero Luna in Eclipticâ, possemus jam, nisi latitudo visâ nobis absteret, uti loco vero Luna, per Reductionem repetitam, $16^{\circ}. 24'. 20''$ \times , tanquam Sol hoc bitorio basset fixus. At integri nihilominus Horarij duo Δ ab equin. $1^{\circ}. 12'. 48''$, ablati à distantia à Nodo (quippe antecedente) relinquunt $9^{\circ}. 23'. 45''$, quæ excerptis lat. hoc momento $51^{\circ}. 54''$. Et quia detractæ sunt Horæ dua temporis, detrahuntur igitur $Afc.$ obliqua gradus 30° ; ut ea sit $55^{\circ}. 52'$, dans Paral. longit. $4^{\circ}. 41''$, in acc. latit. $50^{\circ}. 43''$. Aufer eas à $16. 24. 20$ \times & à lat. $51. 54$ verâ. Restat visâ long. $16. 19. 39$ \times , visâ lat. $1^{\circ}. 11''$. Sept. Et quia Sol ponitur $16. 48. 27$ \times , ut prius: jam igitur est visibilis anteceffio $28^{\circ}. 48''$. Prius vero erat Superatio $19. 31$, cum visâ lat. $15. 57$ Sept. Motus ergo visus Δ à \odot est $48^{\circ}. 19''$, incr. lat. $14^{\circ}. 46''$. Ergo cum sit visus horarius Δ à \odot $24^{\circ}. 10''$, latitudine visâ per exigua: divisâ Anteceffione inventa, per illum, deberet emergere tempus, quo medium Eclipsis horam electam sequitur. At quia posterior lat. visâ fuit

Initium magna; intutum hoc est. Initium tamen, ut quod paulo anteceffit, sine errore notabili hinc colligitur $H. 10^{\circ}. 26'$ apparentis. Atq; id comprobatur, repetito calculo ad hanc horam. Pro tempore vero & quantitate obscurationis maxima, res redit ad solutionem Trianguli: cujus jam supra investigata sunt

In Exemplo ad præc. 168. latera $28^{\circ}. 50'$, & $25^{\circ}. 13'$; & addito motu Solis intermedio, $31^{\circ}. 30'$ & $27^{\circ}. 33'$, & tertium $55^{\circ}. 18'$: motus sc. Luna visibilis ab equin. hor. 2, in linea obliqua: ut sit vis. Horarius $27^{\circ}. 39'$. Perpendicularum deniq; fuit inventum $10^{\circ}. 20'$, tanquam pro distantia Centrorum in obscuratione maxima, siquidem visibilis motus maneret recta linea. Per hanc igitur summam Semidd. $31^{\circ}. 27'$, constituuntur Scrupula

defectus $21^{\circ}. 7'$; & hæc in diametro Solis $30^{\circ}. 42'$, sunt digiti $8^{\circ}. 15'$. Cum eadem Centrorum distantia fuit etiam inventa pars de distantia situum Lunæ, respondens Superationi, $27^{\circ}. 33'$, quæ per inventum Horarium $27^{\circ}. 39'$ divisâ, fit $H. 0^{\circ}. 59'. 46''$: quibus subtrahitis à tempore, ad quod fuit inventa illa Superatio & locus Solis, remanet momentum apparens, tanquam obscurationis maxima, $H. 11^{\circ}. 32'. 14''$. Et horario Solis ducto in hoc temporis intervallum, elicitur motus Solis competens $2^{\circ}. 29''$; ut sit locus, ubi Sol plurimum rectus fuit, $10^{\circ}. 45'. 58''$ \times .

Repetito autem calculo Parallaxium ad hoc momentum, id quidem confirmatur; invenitur enim Δ $2^{\circ}. 58''$ ante \odot loco Ecliptico, sic enim proximè cadit in perpendicularum ex centro \odot in obliquum suum iter visibile. At centrorum distantia reperitur minor, $8^{\circ}. 41''$: defectus igitur 9 dig. ferè. Non fuit igitur pars Solis residua minor 3 digitis. Id confirmatur ex eo, quod in Italia, regni Danie provinciâ, sub alt. $P. 57^{\circ}$, adhuc tenuis linea de Sole prominere visâ est infra: latit. visâ Δ adhuc Sept. necesse est ergo, mihi sub alt. $P. 47^{\circ}$, pervenerit ad $7. 8.$ vel 9 scrup.

Restant scrupula Durationis dimidiæ; quæ per illud perpendicularum $10^{\circ}. 20''$ (ut eodem filo perga-

mus ad finem) & per summam Semidd. invenitur $29^{\circ}. 43''$, quæ per $27^{\circ}. 39''$ horarium Δ , intra Etu suo obliquo ad Ecl. divisâ, dant $H. 1^{\circ}. 4'$. Tota ergo duratio fuisse $H. 2^{\circ}. 9'$, per hanc quidem Lunæ diametrum: & subtrahitis $H. 1^{\circ}. 4'$ à constituto momento obscurationis maxima, initium $H. 10^{\circ}. 21'$; additis, finis $H. 12^{\circ}. 36'$. Repetito tamen calculo, deprehenditur finis $H. 12^{\circ}. 47\frac{1}{2}''$. Quia varietas parallaxium lege Ali rectilinei coæcari nequit.

Observavi, paulo post finem Eclipsis, distantiam Solis à vertice Quadrante spithamali, non totorum 54° gr. quæ dat finem ante $H. 0^{\circ}. 54'$, sed error unius gradus hæc in distantia à vertice, efficit 21 minuta. Satis igitur propinquè convenit calculo cum observatione.

Si Luna, ob involucrem ærium inconstans, hæc vice major fuisset; produceretur Duratio, & quantitas defectus augetur nonnihil.

Durationem quidem in Opticis prodidi longiorum, at manifestâ hallucinatione, dum principium non observatum legitime, fini comparavi, minimè comparandum. Quin etiam addita in margine observatio, tanquam Uraniburgica, quamvis nequè Tychonis sit, qui tunc Insula excesserat, nec Uraniburgica omnino; durationem tamen tantam convellit. Apparet enim ex fine $H. 12^{\circ}. 32'$; observationem esse Origanii Francofordiani ad Oderam, qui hunc finem annotat: initium autem expressit sic, $H. 10^{\circ}$, quod alius superveniens legit $H. 10. 3$. Itaq; non plus habet Origanus temporis, quam $H. 2. 12'$. Sed de hac observatione alibi plura.

De postrema & menstrua Temporis Equatione in Eclipsibus.

POST consumpta omnium Artificum consilia, post tot inæqualitates Lunæ prolatas in lucem, adhuc contumax sidus, legesq; respiciens, passim exorbitat minutulè: cum primis verò, ratione multis exemplis comprobata, circa punctum æquinoctii verni, serius sub Solem vel in umbram succedere deprehenditur, circa autumnale maturius, quam indicat calculus hætenus explicatus. Sed experimenta suppeditarunt hætenus solæ Eclipses: quid accidat Lunæ, cum absente Sole puncta æquinoctialia trajicit, nemo, quod sciam, attendit: causas igitur inquirere immaturum est, nec hujus libri. Interim ergò, dum dies illas proferat, sequemur regulam à mediocri experientia conformatam. Computato tempore \odot Eclipticæ, & in apparens converso, subtrahæ locum Apogæi \odot à loco Δ sequente; aut vicissim hunc, si præcedat, ab illo; intervallum, in Tab. Equationum Lunæ, quære inter gradus integros An. Eccentri, & in eadem cella subscriptâ characterib; minusculis æquationem physicam octuplica: conficies Minuta Horæ, quæ hujus æquationis menstruæ nomine in primo casu sunt auferenda amplius à tempore in apparens converso; in secundo casu addenda. At si tempus alicujus Eclipsis est observatum, & ad id computandus est locus Lunæ ex Tabulis, id tempus ut apparens; convertendum prius est in æquale, sicut per usitatas æquationes annuas, sic etiam per hanc menstruam, via utroq; casu contraria. In primis autem in Solis Eclipsibus adhibenda est hæc

Ex præc. 168. Quotiens ex aliena operatione manifest, expressa appè vis tertie parte exempli ex mfor. Ergo pro lege

Finis. Confirmatur finis observatione.

PRÆCEPTUM 171. Secundum Cap. XV.

Tabb. fol. 90. 81.

hæc mensura æquatio, ut cujus effectus in Parallaxibus Lunæ non est contemnendus. Orientibus enim ☉ vel ☽ in Climate nostro, intra trientem unius horæ, mutatur angulus Orientis 2° gradibus, & Parallaxis latitudinis, sesquiscrupulo; in meridionalioribus majori; quod digitum ferè unū in disco Solis efficit: quæ varietas multum ad hoc pollet, dies an nox futura sit in Terris.

Exemplo sit Eclipsis illa Solis. Nam si utar æquatione Tychonis solâ, tempus assumptum ad computandum locum ☽ apparentem, hora 10° antemeridiana equali, fiet apprens hora 10° 13'. Gratij, distantia centrorum habens 25'.48', itaq; iam ante 13 Minuta debuisset initium Eclipsis videri, sc. ipsa hora 10° apparenti. At quamvis horologium Urbis ex alt. ☉ deprehensum sit tardum, tamen etiam in illo, cepit Eclipsis h. 10° 14' circ. quod verè erat h. 10°. Tardius igitur Luna ad Solem venit, quam fert æquatio Tychonica temporis. At si mensurâ etiam æquatione utar, ablato 17 M, loco ☽, à 6 ☉ Apogeo ☉, sit distantia Gr. 109: & Anom. Ecc. ☽ 109. subscripta est æq. pars physica 2°. 22', quæ ducta in 8, efficit Minuta 19: quibus additis ad H. 10°. 13' tempus à Tychone apprens factum, sit apprens verè 10°. 32' Gratij. Suprà verò cum locum Lune verum computarem ex H. 10°. æquali, Parallaxes ex H. 10°. 32' apparenti, inveni sanè distantiam centrorum tantam, ut initium Eclipsis h. 10. 26'. app. esse potuerit; id quod observationi congruit

Si loco Tychonice usurpetur Astronomica æquatio, illa plus quam Tycho, jubet subtrahere; ita major adhuc fieret mensura. Sed neg. tercia, physica, temporis æquatio sufficit; adderet. n. tantū 8 minuta: restarent adhuc 9½ addenda pro mensurâ. Sed de aliarum Solis ☉ & ☽ Eclipsium testimoniis, plurim in Hipparcho agam, ut & de ijs, quæ dissentire deprehenduntur à regula.

Altitudinem addiscere luminaris deficientis.

PROTESTI id instrumentis obtineri. Sed in eorum defectu sit per superiora notus gradus oriens, & angulus ejus, & distantia deficientis ab illo. Horum Logarithmis junctis, summa ut Logarithmus exhibet arcum altitudinis.

Inclinationem computare defectus ad circulum Verticalem per centrum deficientis actum.

PER tempus, quo talis vel tantus defectus est appariturus, quærat, si non antea scitur, altitudo luminaris; cujus Antilogarithmus ablati ab Antilogarithmo anguli Orientis, relinquit Antilogarithmum anguli, quo circulus Latitudinis ex centro Luminaris ductus, inclinatur ad verticalem circulum per idē luminaris centrum ductum. Hoc primum est elementum ad quæsitam inclinationem. Hic angulus, in occiduo Eclipticæ quadrante, dexter est supra Eclipticam, & occiduus à verticali; sinister infra: in orientali

Deinde ex visa long. & lat. ☽ à ☉, indagetur distantia Centrorum, utilis etiam ad alia futura; nisi ea habeatur dudum. Ablato igitur hujus Log. o Logist. à l. logistico distantia long. ☽ à ☉, restat Logarithmus anguli inter eundem circulum Latitudinis & lineam *Μεσημιον*, qui est elementum quæsitæ Inclinationis alterum, stans ad occasum circuli lat. si ☽ est ante ☉, ad ortum, si superaverit eum motu viso. Si visa latitudo parva est, consultius hujus Log. o uteris, ut prodeat anguli quæsitæ complementum. Compositione verò utriusq; Elementi vel alterius ab altero subtractione, pro re nata, formatur Inclination quæsitæ; quæ sæpè absurda videtur primâ fronte, in parva sc. quantitate defectus; ut Luna videatur sub solem ingredi à plagâ orientis, in alia Eclipsis exire à plagâ occidentis, puta respectu verticalis. Componuntur autem elementa, si circulus latitudinis medius intercesserit inter Verticalem & Diacentron; aufertur alterum ab altero majori, si contrâ; & tunc sequitur quæsitæ Inclination plagam elementi secundi, quantisper id altero fuerit majus; contrariam, si minus.

Sic in Eclipsi anni 1598, ad horam apparentem Gratij 10°. 26', oriente 22½ II.

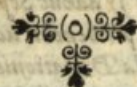
*Anguli Orientis Log. 58220 Ant. 18707
Anguli Verticalis 96. Log. 587*

Pro alt. Lumin. summa 58807 Ant. 18440

Diff. 265. Hæc

ut Antilogarithmus dat 4°. 10'. Elementum prius, ad occidentem, supra Ecl. quia ☽ in Quadr. occiduo. Et quia hoc momento principium eclipsis fuit, & distantia centrorum, (ob lat. visam parvam 0. 30' Sept.) ipsi summa semidd. equalis ferè, utar latitudinis logistico 479000, à quo dempto logistico dist. centrorum 64600, residuus 414400, ostendit 0°. 54' Complementum anguli inter Diacentron & circ. latitudinis. Ita sit elementum alterum 89°. 6'. ad occasum, quia ☽ videtur anterior Sole; & supra Eclipticam, quia lat. visa Sept. Cum igitur utrumque Elementum sit ad occasum, medio arcu latitudinis componenda sunt, ut fiat 93°. 16'. Ita defectus principium videri debuit ad dextram Solis oram, parum admodum deorsum versum. Igitur habet observatio, visum esse quasi præcisè ad dextram; quia in aspectu raptò, 3° gradus de ora Solis, in 360° divisa, non sentiebantur.

*Ita si ad horam 12. 47' apparentem Gratij, computes inclinationem, oriente 23☉. primum elementum reperietur 32°. 22'. ad occasum: alterum per distantiam centrorum 31'. 27" (summam semidd. quippe in contactu, desinente Eclipsi.) & per long. ☽ à ☉, in Eclipticâ visâ 25'. 52" computatur 55°. 20' à circulo Lat. ad ortum: qui cum hic non mediet; subtractio fieri debet elementorum; restatq; 22°. 58', de elemento secundo, quod hic majus erat. Ergo inclinatio à verticali tanta fuit ad Orientem. Confir-
mabat & hoc observatio, in radio enim Elliptico in pavimento, inveni inclinationem 22½, à sinistra sursum, quod erat in cælo, à sinistra deorsum.*



Quomod

Per præcisè

Vide Astr. P. Optica cap. XI. Ep. Astr. f. 892.

præcipi. 170

PRÆCEPTUM 172

PRÆCEPTUM 173. Per præc. 172

Astr. P. Opt. f. 385.

Quomodo ex observatione principij vel finis Eclipsis Solis, vel etiam phaseos cuiuscunque exacta, locus Lunæ verus eruatur in suâ Orbita.

PRÆCEPTUM 174

Per præc. 141

147
Data Inclinatione Eclipsis.

Opt. C. XI.
Vt præc. 173.

Per præc. 153

Per præc. 133
170

AD tempus observationis exactè cognitum, quærat^r locus Solis, cum ejus Parallaxi & Semidro, locus item ☾, cum Parallaxi & Semidiametro: hæc enim tardè mutantur, nec temporis æquatio neglecta multum ijs nocet. Quod si simul fuit observata Inclinatio defectus, quod genus observandi excolui in Opticis: tunc quære ejus elementum primum, & per resolutionem processu proximi, elementum etiam secundum: Cujus L. logistico addito ad L. logisticum distantia centrorum, quæ ex observatione innotescit, fit L. logisticus long. ☽ à ☉ visibilis, quæ cum loco ☉ dat locum ☽ visibilem in Ecliptica. Ergò Parallaxin long. ☽ à ☉, adde vel aufer viâ contrariâ, quàm prius cum ex verò visibilis locus fieret: ita conficitur locus ☽ verus in Ecliptica, qui per distantiam à ☾ facile reducitur ad Orbitam.

Ut, in Exemplo proximo, finge tempus exactè fuisse observatum hor. 12°. 47', quando defuit Eclipsis Gratiij, unâ cum inclinatione 22°. 58'. Invenitur locus ☉ 16°. 51' H, ☽ 6°. 58' H, Parallaxes & semidiametri ut supra. Invenitur igitur per tempus apparens & locum ☉, elementum prius 32°. 22', quod additum ad 22°. 58' (quia prius subtrahi debuit) facit elementum secundum 55°. 20' cujus Log: 19544, cum Summa semidd. 31°. 27' (quia in fine Eclipsis, hæc est dist: centrorum) logistico 64595, componit 84139 logisticum 25°. 51' long. ☽ à ☉, quæ addita ad locum ☉, facit locum ☽ visum 17°. 16'. 51' H, quia finis est Eclipsis & Luna superavit ☉. Adde Parallaxin long. ☽ à ☉, 26°. 38' quia projecit ☽ in occasum: conficies verum in Ecliptica 17°. 43'. 29' H. Et hic cum elongetur à ☽ per 10°. 38', dat Reductionem 2° 44'. Ut ita sit locus ☽ in Orbita, respondens huic tempori apparenti 17°. 40'. 45' H.

PRÆCEPTUM 175.
Sine Inclinatione Eclipsis.

Per præc. 133
170.

Quid si verò non sit simul observata Inclinatio? Tunc per distantiam Solis à Nodo adsciscenda est & latitudo præterpropter, ut quæ minus habet dubitationis; & in uno semisse horæ non ultra 1' variat, eoque longitudinem præstat tantò securiorem, quanto visibilem lat. minorem.

Igitur ad momentum observationis, exquirantur parallaxes long. & lat. ☽ à ☉, veraque lat. ex calculo, convertatur in visibilem. Hujus Antilogarithmo ablato ab Antilogarithmo distantiarum, restat Antilogarithmus long. ☽ à ☉ visibilis ut supra. Cætera ut prius.

Ut quia principium hujus Eclipsis fuit observatum Uraniburgi, H. 10. 10' (per studiosum à Tychohne in insulam remissum observationis hujus causâ, quando Sol in 16°. 44' H, distans à ☽ 9°. 46' ut ita Luna si loco Solis esset, latitudinem habitura sit 33°. 50' Sep: Parallaxis verò ☽ à ☉ inveniantur ad hoc tempus Uraniburgi 5°. 12' long. in occasum, lat. 55°. 52', sit ergo visibilis lat: circiter 2': (quam post inventum locum ☽ verum licet corri-

Ex præc.

Plura etiam præc. 174. 175. 176. corrigenda essent, si præter exempla Græcæ jam veritas exacta. Sed ☉ crasse, q. ad horam 12. 47. mediam Uraniburgi debuit ad apparentem Gratiij. Sic reduci debet auferenda à loco eclipt. sed addenda, & parallaxes congruunt ante horam 10. 10, nam in ijs quæ hic sunt à textu resecti, monuerunt de duratione prolonganda fuer. ex iudicio Lefschienfis & calculi.

gas,) hæc inquam visibilis lat. tam parva, distantia centrorum 31°. 27' parum admodum detrahit, ut fiat visa Long. ☽ à ☉, 31' circiter; quæ ablata à loco ☉, quia Eclipsis incipit, dat locum ☽ correctum in Ecliptica sat fidum 16. 13. Verum, ergo addita parallaxi occidua, 16. 18. ut sit vera antecessio 26. 8.

Hæc profectò omnium certissima ratio est observandi loci Lunæ: si modo de loco ☉ vero nihil sit dubitandum, nec in minimis Scrupulis fluctuet; de qua suspitione alibi dicendi locus est.

Vide præc. 188.

Quomodo ex Observatione certarum Phasium Eclipsis Solis in diversis locis, indagetur differentia Meridd.

PRÆCEPTUM 176

CERTISSIMÆ omnium phasium sunt, merum initium & finis merus: aut si quantitas defectus circino sit definita in radio, detersa de radio simbria, quam ei circumjicit amplitudo foraminis.

Vide Opticam Astr. Partem cap. XI.
Per præc. 173

Ex observatione ejusque loci, ad tempus in eo apparens, quærantur loci ☽ veria ☉: quibus inter se comparatis, si diversarum plagarum fuerint, Summa, vel si ejusdem, differentia; per horarium verum ☽ à ☉ divisa, prodat Horas & Minuta respondentia; quæ addantur ad tempus apparens illius loci, cui locus ☽ prodijt anterior: tempus sic mutatum comparetur cum ejus loci tempore observato, patebit Meridianorum differentia.

Ut in Eclipsi nostra, sit Gratiij observatus finis eclipsos H. 12. 47' exactè; quando Luna Solem insecuta fuit verè 52. 29'. Sed est Uraniburgi observatum principium H. 10. 10', quando Luna antecessit Solem verè, 26. 8'. Summa est Gr. 1. 18'; quæ divisa per horarium ☽ à ☉ 33. 54' quotientem habent H 2°. 19'. Et quia Uraniburgi Luna locus antecedit, adde ejus tempori, inventum, sit 12°. 29'. At Gratiij Luna posteriorem illum locum obtinuit H 12°. 47'. Effet ergo diff. Meridd. 18.

Per Logg si placet.

Optimus & hic modus est, & pulcherrimus, indagandi differentiam Meridd, & qui alteri, per Eclipses ☽, multo præstat. At ut Cap XVI, dixi, non sine suffragiorum aliqua multitudine concludendum est de minimis, præsertim si visa latitudo, ut hic in fine, fiat magna: tunc enim minus fida per eam præstatur longitudo.

Præcept. 57.

De Azimutho seu plaga Mundi invenienda, in qua luminare deficiens spectatur.

PRÆCEPTUM 177

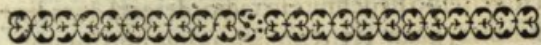
PTOLEMÆUS in Quadripartito jubet etiam regiones Cæli considerare. Traduntur igitur modi generales in Sphæricis, inquirendi Azimuth: nos hic de solis Eclipsibus agimus. Utamur igitur ad opus, jam antea necessarijs. In Ecliptica tria sunt puncta, Luminare, culminans in Meridiano, & Gradus Nonagesimus ab ortu: quæ cum Vertice connexa, bina constituunt triangula: & est angulus cõmunis ad Nonagesimum reclusus. Cum igitur angulos ad verticem metiantur atcus Horizontis, quos Arabes Azimutha dicunt: clarum est, binorum horum Triangulorum angulos ad verticem esse inquirendos. Ergò tale nascitur Præceptum.

Epit. Astr. l. 111. f. 228.

Per

Per tempus apparens & locum Solis, innotescit Nonagesimus ab ortu, & distantia ejus à Vertice, à Culminante, & à Luminari. Ergò Logarithmos distantiarum, & Luminaris & culminatis, à vertice, aufer à Logarithmis distantiarum utriusque illorum à Nonagesimo, restabunt Logarithmi angulorum ad verticem, quorum alter Amplitudini ortive est equalis: qui vel compositi, si *culminans* medium invenitur trium punctorum, vel si non, subtracti, minor à majori, formant Azimuth quæsitum. Plazam docebit inspectio vel imaginatio Sphæra.

Sic in Eclipsi oriente 23 5, Nonagesimus est 23 V, culminat 30 H, Luminare est in 17 H. Hæc ita distant à vertice, 42. 47. 12. 52. 48. Inveniuntur igitur anguli, 32. 40, Amplitudo ortiva, 46. 21: & subtractione illius ab isto, Azimuth 13. 41 à Meridie in Occidentem.



CAPUT XXXIII.

DE CONIUNCTIONIBUS ET OPPOSITIONIBUS ALIORUM Planetarum, & de *εξελυμῶν* & *Αποκαταστάσει*.

PRÆCEPTUM 178. Singulorum cum Sole.

Per præc. 76.



CONIUNCTIONES mediæ Planetarum sex & ♄ & ♀, singulorum cum Sole, sic indagantur. Ad tempus propositum colligantur motus medij, Solis & cæterorum unius: & auferatur locus celerioris à loco tardioris, adscitis, si opus est, 12. signis: quod restat intervallum leviori ad penderosorem (sic Astrologi loquuntur) Signis in Gradus convertis, dividatur per sex, ut prodeant Scrupula Restitutionis unius integræ, pauciora quàm 60. Cum his Scrupulis ex Canone Sexagenario dierum, qui spectat ad quæmq; Errorum, excerpantur Sexagena Dierum, Dies, & Scrupula, tempus scilicet desideratum. Si de Oppositione quærat, aut de ♀ & ♄ retrogradorum cum ☉, aut de ♄; Scrupulis Restitutionis integræ adimantur 30, aut si non possunt, addantur: & tunc fiat excerptio.

Tabb. f. 100 VOL. 102.

Præcept. 52.

Ut in Genesi Rudolphi. collectus fuit motus medij ☉ Sig. 4. 6. 14. 22. H Sig. 11. 5. 35. 5. Illius ergo ut celerioris motu ab hujus motu detracto, restant Sig. 6. 29. 20. 43. seu Gr. 209. 5. c. Horum pars sexta est 34. 53. 27. quæ dicantur nobis Scrupula Restitutionis. Igitur cum 34 excerpuntur Dies 3. 34. 5. 7. & cū 53 excerpuntur 5. 33. 59. cum 27 excerpuntur 2. 50. Summa sit 3. 39. 51. 56. id est, Dies 2 19 & Scr. 51. 56. Tantum restat temporis ad proximam ☉ mediam ☉ h.

Tabb. f. 94. & 100.

Pro oppositione, loco 34. 59. 27, usurpanda fuissent 4. 59. 27, abjectis 30. Eadem ferè ratio est restitutionis ad suum Apogæum, ad ☉, vel ad ♄: nisi quod Quartarum unius Restitutionis tempora sunt in arcis. Ergò dividendum est intervallum inter ☉ & trium reliquorum: unum, non per 6 sed per 12, ut fiant Scrupula non unius Rest. integræ, sed unius Quartæ.

PRÆCEPTUM 179.

Pro ☉ medijs, 5 Planetarum & ♄, inter se mutud, ut sciatur, quâdo sequatur quælibet tem-

pus propositum: quære ☉ cujusq; cum ☉ proxime sequentem seorsim, & aufer tempus collectum pro celeriori, à tempore pro tardiori, assumpto, si opus erit, tempore unius Restitutionis integræ Solis ad eum, vel ejus ad ☉:

Tunc perlustra singulas Canonum duorum lineas, attendens, quando arcæ utriusque, differentiam æqualem ei, quæ modò restabat, inter se faciant, & in quotis numerorum membris. Consequeris autem id ingressu duplici exactius, primo per Restit. integras, deinde per Scrupula, &c. Quæ igitur tempora ex arcis excerpta hoc præstant, eorum quodq; est adjiciendum tempori, suæ ad Solem restitutionis proximæ; membris numerorum, in quibus tanta differentia reperta fuit, subordinatis, quòq; sui simili: ita utrobique æqualis conflabitur Summa temporis, quæ ab initio proposito transacta conjunctos exhibebit duos planetas.

Tabb. f. 100 101.

De *Αποκαταστάσει*, seu reversionibus plurium siderum ad idem caput, inveniendis.

PRÆCEPTUM 180 Duorum ☉ is Periodus.

Quantum verò temporis intervallum intercedat inter duas proximas conjunctiones medias eorundem Planetarum, sic invenies. Si duorum unus est Sol. tempora Restit. sunt in arcis, præterquàm in Canone ☉ ☉, in eo enim Quartarum Rest. tempora sunt in arcis condita. Ergò quoties in cæteris descenditur per lineam unam, in Lunari Canone per 4 lineas est descendendum, ut comparari possint tempora harum Restit. ☉ ad Apogæum & ♄. Si verò non est Sol duorum unus; quære tempora in duorum aliorum Canonibus æqualia, Restitutionum scil. Solis ad utrumlibet, non attento numero Restit. in margine; & quæ Summa temporis utrobique; inventa fuerit eadem, illa definiet Periodum quæsitam. Hic etiam locus est ingressui duplici ad æquanda exactius tempora.

QUANDO denique fiat Apocatastasis plurium inter se mobilium, eorumve Quadratorum vel oppositorum locorum; etsi operotum est, præstant tamen hi Canones adjumenta opportuna. Discrimen initio notetur Periodorum, causâ Longitudinis. Brevissima est ☉ ad ♄: exinde hic ordo, ☉ ad ♀, ☉ ad ☉, ☉ ad ♄, ☉ ad ☉, ☉ ad ♄, ☉ ad ♀, ☉ ad ☉, ☉ ad ♄, ☉ ad ♀.

PRÆCEPTUM 181 Plurium ☉ is Periodus.

Facigitur initium à Periodo breviori: ejus tempus, quod in suo Canone reperitur exactus, quære in Canone tardioris, & constitue proportionem Restitutionum utrinque; per marginis numeros, tempusq; p areas, in quo, quàm fieri potest, minimo, tria mobilia quàm proximè rursù coeant, Quartasve aut Oppositiones assequantur. Quod si primo ingressu fuerit aliqua differentia residua temporum, quibus singula cum Sole conciliantur, secundo ingressu perge ad sexagecuplorum tempora in numerorum membris posterioribus æquanda exactius. Nam si in hac quoque Periodo majori, residua fuerit aliqua differentia; illa multiplicata aliquoties cum suis tempo-

Per præc. 180

Temporibus, & Restitutionum numeris, tandem excreſcet in magnitudinem differentiæ Periodi minoris: itaque corrigetur, ſi ijs aliquot majoribus, adjeceris vel ademeris unam minorem; quo pacto periodus conſtituetur tertia. Si tempus hujus Periodi tertiæ, quæ non multis vicibus contineatur in ætate mundi, quaſiveris etiam in Canone quarti Mobilis, quod Reſtitionem ad \odot tardioſam habet, aſſociabis & illud ad eandem Apocataſtaſin quàm proximè. Semper autem diſcrepancia, ſi qua emerget, in tardiori facilius toleratur, quippe correctione ejus motus mediæ tollenda; quàm in celeriori, quippe quæ tardius etiam excreſcit in aliquam ſenſibilem magnitudinem.

Evolutiones motuum

In Luna motibus inter ſe conciliandis laboraverunt veteres, Periodo nomen fecerunt $\epsilon\zeta\lambda\gamma\mu\delta\varsigma$ Evolutio. Igitur differt Quarta latitudinis à Quarta Anomalie per $5^{\circ}.8'.6\frac{1}{2}''$. Hæc differentia per omnes Canonum lineas deſcenſu facta, non excreſcit ad magnitudinem temporis unius Quartæ. Ergo reſverſus ad lineam ſummam, ex Reſtitione 1, facio 1, ſeu 60, tunc & differentia fit $5^{\circ}.8'.6\frac{1}{2}''$; itaque ſecundo ingreſſu per Reſtit. 20, invenio differentiam D: $1^{\circ}.42'.42''$, quæ addita priori, facit differentiam D. $6^{\circ}.50'.49''$, æqualem ſere tempori unius Quartæ. Quare correctio fit ſubtractione unius Quartæ de tardiori: naſciturq; Periodus minima 79 Quartarum Anomalie, & 80 Quartarum Latitudinis, cujus tempus eſt $9^{\circ}.4'$: ſed Anomalicum jam deſicit per $2^{\circ}.30'.17''$. Hujus igitur periodi ſocia erit, quæ habet 80 An. & 81. Lat. cujus tempus $9^{\circ}.11'$. Hic adhuc ſuperat Anomalicum per $2^{\circ}.37'.50''$. Et quia hic exceſſus & ille deſectus ſunt pene pares, altera Periodus alteram corrigit, ſemel ſumpta. Fit ita periodus ſecunda 159 Quart. Anom. & 161. Quart. Latit. cujus tempus $18^{\circ}.15'$, &c. in quo ſuperat Anomalicum per $7^{\circ}.33''$.

Hoc verò tempus quaſitum per Canones ceteros, invenitur ſere in Linea 3 Canonis anni Tropici, ſeu $\odot \circ \vee$. Sed quia neutrum horum 2 motuum erat inter tria priora, nondum igitur hæc 5 inter ſe conciliantur, ſed illa tria inter ſe ſeorſim, hæc duo etiam ſeorſim inter ſe.

Neg multiplicationem inſiſtam patitur reſidua differentia. Cum enim tempus ſit trienniæ, in annis 180 jam ſit differentia $7^{\circ}.33'$, & in 1400 annis ſuperat diem. At in motu Anomalie non poſſumus intra hoc tempus perdere diem, in Latitudinis, ne horam quidem: obſtantur enim obſervationes veterum. Quare pergendum eſt ad Periodum exactiorem. Et quia $7^{\circ}.33''$, continetur in $2^{\circ}.30'.17''$ paulo minus quàm vicies, naſcetur Tertia Periodus per vigecuplationem ſecundæ, & additionem unius primæ minoris, ut illius exceſſum vigecuplum, hujus deſectus obliteret: ita Quartis 3180 & 3220 accedent 79 & 80, ſuntq; 3259 & 3300. Tempora colliguntur $6^{\circ}.14'.10''$, &c. exceſditq; Anomalicum per $45''$: per Canonem vero Ju-

lianorum redacta ad annos, dant $61\frac{1}{2}$.

Quærat Calculator hoc tempus per ceteros Canones, ſi fortè & reliqua mobilia ſaltem per Quartas ſe aſſocient. Qui ſi diem non traverit ullam intra 1700 annos, quæ tres Lunæ motus (nihil enim de cæteris Erronibus dicam) ad Quartas, non dico eaſdem, ſed promiſcuas, reſtituat, tolerabili cum diſſidio: tunc ego convulſam ab illo probabilitatem diei Creationis à me propoſitæ fatebor. Ea fuit anno 3993 ante æram noſtram, die 24 Julij Juliani retrò extenſi, Sole, Luna, Nodo D , Marte, Venere, Aphelio Q , Nodo Jovis, & fortè etiam Aphelio Jovis, junctis in puncto ſolſtitiali; Jove, Nodo Q , in brumali; Saturno, Aphelio Q , & Apogæo D , & fortè etiam Aphelio H , in autumnali; Mercurio, Apogæo O , Nodo H , Nodo Q , & fortè etiam Nodo J , in vernali; ut ſolum Aphelium J ex omnibus, inter \vee & \odot incertum, & loco quidem præciſè intermedio, conſtiterit.

Carceres, ubi de proſilie. runt omnia mobilia in curſus ſuos. Vide præc. 76.

Anticipationem, $\omega\rho\acute{o}\epsilon\mu\pi\lambda\omega\sigma\omega$, Equinoctiorum, Perendinationem, $\mu\epsilon\tau\acute{\epsilon}\mu\pi\tau\omega\sigma\omega$, Ortus fixarum, & Præceſſionem Equinoctiorum, ſeu Quantitatem anni Tropici mediam, indagare in quacunque annorum Summa aſſumpta.

PRÆCEPTUM 182
183
184

SUMMAM annorum, diſiſione per 60, converte in Sexagenas Primas, Summam Primarum in Secundas, &c. cum his Sexagenis & annis ſingulis, in margine Canonum Sexagenariorum quaſitis, excerpe tempora, ſub Julianorum, Tropicatorum, & Sideriorum titulis, quæ que leorſim; hæcque additione convenienti excerptorum per diverſos ingreſſus, ſi tempus Tropicatorum ſubtraxeris à tempore Julianorum, reſtabit $\omega\rho\acute{o}\epsilon\mu\pi\lambda\omega\sigma\omega$ ſi Julianorum tempus, à tempore Sideriorum, $\mu\epsilon\tau\acute{\epsilon}\mu\pi\tau\omega\sigma\omega$; ſi deniq; Tropicatorum à Siderijs, Præceſſio, quæ æquat $\omega\rho\acute{o}\epsilon\mu\pi\lambda\omega\sigma\omega$ & $\mu\epsilon\tau\acute{\epsilon}\mu\pi\tau\omega\sigma\omega$ junctas. Sed in Anticipatione & Perendinatione cura, ut annorum propoſitorum numerus ſit pariter par.

Vi præceptis 77. 78. 79. 80
Tabb. f. 192.

Vide Epit. Aſtr. l. VII. f. 27.

De Apocataſtaſi annorum Tropicatorum & Sideriorum ſeu de Anno magno cæleſti.

$\epsilon\zeta\lambda\gamma\mu\delta\varsigma$ verò annorum Julianorum Tropicatorum & Sideriorum veſtigabis Methodo ſuperiori. Invenies autem 25411 Siderios, æquales 25412 Tropicis. Julianorum verò & Tropicatorum eſt ſere duplo tardior; nec non & Julianorum cum Siderijs. Deniq; omnium trium in idem caput Reſtitutio, immanem Summam annorum poſtulat: quam relinquo calculatori quaerendam.

PRÆCEPTUM 185
Per præc. 180
181



IN PARTEM QUARTAM TABULARUM
RUDOLPHI PRÆCEPTA.

CAPUT XXXIV.

DE OBLIQUITATIS ECLIPTICÆ VARIATIONE.

Ve di 7^{um}
Cap. XII.
Prac. fo. 27.



UM res dubia sit, An omnino mutetur obliquitas Eclipticæ successu sæculorum; & si mutatur, quo igitur id fiat modo, qua quantitate: sciat igitur Astronomus, ad calculum motus Planetarum accessurus: nullam illi obiectum iri remoram, nullum impedimentum, si maxime totum hunc locum prætereat intactum; usus obliquitate Eclipticæ tanta, quantum hodierno tempore dimensi sunt artifices præstantissimi, $23^{\circ} 31' 30''$, vel per nostram diminutam Solis Parallaxin $23^{\circ} 30' 30''$: quasi hæc quantitas sit perpetua. Hæc causa est, cur locum hunc in finem totius operis rejecerim, qui in Copernico & Prutenicis occupat ipsum vestibulum, tanquam præcipuum totius operis Emblemata & gloriatio.

Causa or-
nia.

Tabb. f. 103.
104.

Quas vides
Tabb. f. 103.
in calce.

Vide Epit.
Astr. fol. 337
& 917.

Si cui tamen lubet etiam hunc tentare calculum: sciat igitur, quinque ejus formas in his tabulis proponi, quarum prima sequitur fidem Observationum Eratosthenis, quem secutus est Hipparchus, confirmavit observando Ptolemæus, ut ipse quidem affirmat. In eâ conformandâ minimum aliquid indultum à me fuit, electioni Epochæ Creationis. Secunda forma è contrario assumpsit omnia ex speculationibus à priori, quibus tamen lucem prætulit eminens, observationes Eratosthenis & Ptolemæi. Tertia, quarta & quinta sunt mixtæ; quæ cum omnes partes speculationis, secundum dictas observationes, tueri non possent; retentis igitur aliquibus partibus, quæ majorem in speculando verisimilitudinem habere videbantur, cæteras partes ex veterum observationibus, cum archetypicâ speculatione conjunctis, necessitate demonstrationum eliciunt.

Circa has igitur quinque formas, diligenter est attendendum computatori, quamnam initio sibi proposuerit sequendam: ejus enim tramite pergere debet ad finem usque calculi.

Eclipticæ
media.

In omnibus quinque formis commune hoc est, quod supponitur circa polum viæ Regiæ, seu Eclipticæ mediæ, circellus aliquis, in quo polus Eclipticæ temporariæ circumeat æqualiter contra signorum ordinem: vel saltem in ejus circelli diametro, quæ coluri solstitionum particula est, libretur rursus profumq;. Dividitur autem circellus iste, more reliquorum, in gradus 360, &c. Principium numerationis sit à puncto, quod est ab Æquatoris polo remotissimum; & progreditur numeratio in antecedentia signorum. Et in hoc sic diviso circello, numeratur Argumentum Obliquitatis, in omnibus quinque formis.

Invento Argumento Obliquitatis, proprio cujusque formæ ex quinque, supputare veram Eclipticæ obliquitatem, secundum illam formam.

Ex Tab. fol.
104.
Per prac. 76.
commune.

ET si Tabulæ exhibent jam computatas, in forma prima tritiori, obliquitates ipsas: quia tamen formæ quinque sunt, generaliter, secundum omnes, supputare docebo quod proponitur, non excerpere. Supervacuum enim existimo, Tabulas integras Prosthaphæresion Obliquitatis condere quintuplices; cum res ipsa sit incerta, ut dictum; eoque vel nullus Tabularum talium usus, vel rarissimus. Denique negotium hoc sic est comparatum: ut calculator attentus, præceptum hoc observas, æquè facile computare quæsitum possit sine Tabula; ac ex Tabula jam constructa, per partem proportionalem depromere.

Igitur exscribe Obliquitatem mediam, cujusque formæ, quam hac elegisti vice, propriam; una cum Semidiametro Circelli. Invenies autem ista in Tabula Obliquitatis Eclipticæ, consignata sub calce formæ uniuscujusque.

PRÆCEPTUM 186.

Tabb. f. 103.
inferius.

Tunc Argumenti Obliquitatis Antilogarithmum, adde Logarithmo Circelli competentis: qui componitur, ut Logarithmus, in Canone quæsitus, exhibet Prosthaphæresin Obliquitatis, quam obliquitati mediæ in primo & ultimo quadrante Argumenti adde, in secundo & tertio, subtrahe.

Hæc obliquitas, utroque casu constituta, siquidem in prima forma versaris, propter ejus circelli parvitatem, citra exceptionem perfecta & absoluta est; at in quatuor formis reliquis, tunc solum est perfecta, si polus Eclipticæ libretur in circelli diametro. Si verò circumire polus iste ponitur in circelli circumferentia; tunc ob ejus in quatuor posterioribus formis magnitudinem, opus erit aliqua correctiuncula, quæ sic perficitur.

Argumenti obliquitatis Logarithmum adde ad Logarithmum Circelli, qui proprius est cujusque formæ; Summam & serva, ad usus sequentis præcepti, & jam quære in Tabella Correctionis Obliquitatis, sub titulo Aggregati; & positam in linea correctiunculam, adde ad obliquitatem, prius utroque casu inventam; ita erit absoluta, & secundum quamque formam perfecta obliquitas.

Tabb. f. 104.
in calce.

EXEMPLUM.

Ad annum Christi 883, sit inveniendâ obliquitas, secundum formam quartam. Epochæ anni Chr. 800, proximè minor, dat Argumentum Sig. $5.3^{\circ} 28' 0''$, residui 83, seu proximus numerus in Tab. An. 84, dat $2^{\circ} 41' 25''$. Summa sit Argumentum obliquitatis Sig. $5.6^{\circ} 9' 25''$, seu gr. 156.9: cuius

cujus Antilogarithmum 8926, adde semidiametri circelli formæ IV. 47. 10'' Logarithmo 429035; summa 437961 ut Logarithmus, dat Prosthaph. 43. 6'', subtrahendam Obliquitati mediæ hujus formæ 24. 17. 40'': restat obliquitas tanquam per librationem in circelli diametro 23. 34. 34''. Sed quia statuitur non librari, sed circumire in circello: ejus diametri Logarithmum eundem adde Argumenti jam Logarithmo 90549, fit summa 519584 asseruanda ad sequentia, sed quæ jam ex Tabella correctionis exhibet 7'', corrigende obliquitati modo inventæ libratis: ita fit correctæ hujus modi Obliquitas 23. 34. 41'.

Compara obliquitatem formæ I, quæ ad proximè posteriorem annum 894, exhibet eandem; ergo ipso anno 883 circiter 23. 35'.

Supputare Prosthaphæresin Æquinoctiorum.

PRÆCEPTUM 187.

SI vel nulla est revera mutatio Obliquitatis Eclipticæ, vel talis; ut polus Eclipticæ temporariæ libretur in coluro solstitiorum; hoc inquam posito, nulla neq; prosthaphæresis Æquinoctiorum motus est exquirenda. Sin autem ponimus, Polum dictum circumire in circumferentia circelli, secundum unam ex quinque formis: tunc nascitur etiam hæc prosthaphæresis motus Æquinoctiorum: quæ in prima forma exhibetur jam computata ad interstitia 74 annorum, quibus Argumentum obliquitatis denis gradibus crescit: sed scrupulosius sic potest exquiri communiter in omnibus formis.

Sint initio in promptu. 1. Argumentum Obliquitatis, 2. Obliquitas incorrecta, 3. Aggregatum excerptæ correctiunculæ. Ab hoc igitur Aggregato aufer illius Obliquit. incorrectæ Logarithmum; residuo vicissim adde Antilogarithmum Obliquitatis mediæ; quod in summa prodit, quæ situm in Cahone ut Log. us, monstrabit Prosthaphæresin, quæ titulum addendæ gerit in primo semicirculo Argumenti Obliquitatis; subtrahendæ in secundo.

Ut quia prius erat Aggregatum 519584, & Obliquitas incorrecta, 23. 34. 32''. ejus Logar. 91640 subtrahere; restat 427944. Ad hoc residuum adde Obliquitatis Mediæ Antil. 9237. Summa 437217, inter Logarithmos Canonis quaesita, exhibet 43. 27'; Prosthaphæresin æquinoctiorum quaesitam, secundum formam quartam, ad quam supra pertinebat hoc Aggregatum & Obliquitas mediæ. Et quia Argumentum Obliquitatis est ex primo semicirculo, sc. 156. 9': quare hæc Prosthaphæresis Æquinoctiorum est addenda. In forma verò primâ Prosthaphæresis ut vides, exhibetur circiter 27'. Add.

Quo die cujusque anni ante vel post Christum contingat æquinoctium.

PRÆCEPTUM 188.

Præcept. 139

SUPRA Cap. XXX. in descriptione Tabulæ subsidiariæ motuum Solis, didicisti obiter, computare diem æquinoctij veri; sed suppositum erat, puncta æquinoctialia sub fixis æqualiter retrò reperere; quia Præcessionis hujus inæ-

qualitas incerta est; certè tanta non est, quantum Copernicus tradidit. Vide Progym. Tychonis Tom I. Nunc hoc capite, cum ex forma Obliquitatis quintuplice, totuplex etiam enascatur Prosthaphæresis Æquinoctiorum; præceptum igitur computandi Diem & horam Æquinoctij tradendum est generale: cujus certitudo æstimanda est ex ipso dogmate cujusq; formæ.

Ex Tabulis motuum mediorum Solis, ad annos datos completos, collige motum Solis medium, & locum Apogæi, vel ejus loco Anomaliam annuam. Tunc motui medio adde tot mensium, dierum, & horarum motum medium, quoad vel circulus fuerit completus, pro æquinoctio verno, vel insuper semicirculus, pro Autumnali. Ita constitutum erit tempus æquinoctij medij. Tunc per Anomaliam Solis vel collectam vel formandam per Apogæum & motum medium, excerpatur Prosthaphæresis cum suo titulo, per eandem & diurnus & horarius Solis ex subsidiarijs. Quod si nulla ponitur fieri prosthaphæresis Æquinoctiorum, sola æquatio Solis dividatur per diurnum & horarium: ita prodibunt Dies Horæ & minuta, addenda ad tempus æquinoctij medij, si subtrahenda erat æquatio, subtrahenda si hæc addi deberet: ut habeatur tempus æquinoctij veri. Sin autem statuitur aliqua Prosthaphæresis æquinoctiorum, quærat illa secundum unam ex quinque formis, quæ placuerit, omnes enim dubiæ sunt. Hac Prosthaphæresi constitutâ, pensatio fieri debet in motu Solis, ut quod Prosthaphæresis ista dempsit, vicissim mutatio motus medij reponat nostro tempore. Cumque Pensatio in IV. & V. formis suam habeat Epocham, hæc quidem semper est Sub: Pensatio semper Add: Prosthaphæresis, ut & Æquatio Solis; nunc Sub: nunc Add. Itaque quatuor ista si fuerint ejusdem tituli, conjungantur in unam summam, sin diversorum, minora ejusdem tituli à majoribus subtrahantur, residuum insigniatur titulo majoris. Sic tandem vel summæ vel residui hujus fiat divisio per diurnum vel horarium Solis, & quotiens applicatio ad tempus æquinoctij medij, titulo divisi contraria, ut prius.

Exemplo esto æquinoctium Hipparchi anno 147 ante Christum observatum: colligimus eo anno ineunte Apogæum in 5. 49. 45'' II, Solis medius in 9. 7. 28. 31. Februarii anni commutis addit 1. 28. 9. 11. & sunt II. 5. 37. 42. Dies 24 addunt 23. 39. 20. Fiuntq; II. 29. 17. 2, residuus ad impletionem circuli est motus Horarum 17. 26. 24. Hinc ad Apogæum, Complementum Anomalie numeratur 65. 50', quod dat Æquationem 1. 51. 52'' addendam: invenitur autè eodem anno 147 Prosth: Æquinoctiorum 10. 36'' subtrahenda. Vicissim quia annus 147 ante Christum distat ab Epochâ creationis 3853 annis, per hoc intervallum colligitur Pensatio primæ formæ II' addenda sine Epochâ. Compositis igitur addendis, & subtracto, quod est sub: residuus est 1. 52. 18''. qui divisus per diurnum 58. 10'', facit D. I. H. 22. 20', subtrahenda tempore æquinoctij medij: ut fiat verum æquinoctium, anno 147, corrente die 23 Martij, Horis à meridie Uraniburgico 19. 6. 24'', secundum hanc primam formam Prosth. Æquinoctiorum, differens ab eo, quod sine Prosthaphæresi computamus.

Hæc ita sunt disposita, ut, quia per motum Solis æquinoctia Tychonis & Hipparchi representari op^o est, jam locis horum æquinoctiorum, per earum Prosth. introductam, in Sphæra fixarum longius ab invicem discedentib^o, Solis quidem mot^o per Pensationem alteretur, quantum differentia Prosthaph. postulat: Solis tamen & fixarum an. 1588 sit idem intervallum, quod Tychostabilivit observationibus. Itaq; ad Hipparchi tempora jam divelluntur ab invicem Sol & Fixæ, minus tamen, quam observando consequi potuit Hipparchus: reliquorum temporum ratio nulla fuit habita; etsi discessio sit longius.

De quibus præcept. 181. Passim etiam deseruntur carceres motu^o ☉, à quibus illos profiliisse verisimile est. Ad eò totã Astronomiam susque deq; fert hæc incertæ fidei Prosth. æquinoctiorum, in calculum recepta.

PRÆCEPTUM 192.
De anno siderio. Tab. f. 102.
Quin etiam annus siderius in formis I. IV. & V, tanto diminuitur ab ejus quantitate media, quam exhibet Canon: quant^o fit quotiens, si per diurnum ☉ medium à fixis, dividas differentiam Pensationum ad initium & finem sideriorum propositorum.

Jam quod Prosth. æquinoctiorum, variatæ Obliquitatis filia, nocuit Fixarum longitudini; idem ferè variatio Obliquitatis ipsa, nocet latitudini, ut non manere possit eadem: per omnia sæcula: adeòq; etiam Limitum Planetariorum Inclinatio labem eandem sustineat.

PRÆCEPTUM 193.
De lat. Fixarum ad diversa fac. Tab. f. 105. & seqq. Vide C. XII. fol. 26. 27. & Præcept. 195.
Nam si ponimus, non mutari obliquitatem Eclipticæ: nulla igitur neq; latitudinum fiet mutatio, possumusq; iis uti ut perennibus, quas Braheus singulis ad annum 1600 assignavit in Catalogo. Quanquam finis seu usus ipse, ob quem inquiri solet latitudo stellæ alicujus, sic est comparatus; ut variationem ejus, etsi aliqua esset, penitus, dissimulari suadeat. Sin autem omninò decretum est calculatori, operam ludere in incertis, nec necessariis: age præscribam ei quod agat cumulatè. Nam duplex est ratio computandi latitudinem: prior supponit, quòd polus Eclipticæ libretur in coluro solstitiorum, nullam pariens Propsth. æquinoctiorum. Ea sic habet. Ad tempus propositum inquire locum longitudinis stellæ vel puncti propositi, & obliquitatem Eclipticæ, secundum unam ex quinq; formis, ab hac aufer Obliquitatem nostri temporis, si quidem fuerit minor: Excessus Log. um, adde Log. o longitudinis stellæ vel puncti propositi, ab æquinoctio, antè vel post: summa quaesita inter Log. os. exhibet scrupula, quæ sunt Australi quidem latitudini in Signis borealibus, & boreali in Meridionalibus, addendâ; Boreali verò in Borealibus, & Australi in Meridionalibus subtrahenda.

Per præ. 190 186.

Hunc modum tradit Longimont. Theor. f. 92. priusde quasi polus Eclipticæ libretur in coluro solstitiorum, cum in serim tamen ille computes Prosth. æquinoctiorum ex circuitu poli in circello. Theor. f. 88.

At si obliquitas nostri temporis fuerit major, vicissim ab hac aufer illâ, quam invenisti ad tempus prop. & cum scrupulis latitudinis elicitis, age per omnes casus, contrarium ejus, quod jam est dictum.

Altera computandi ratio supponit Polum Eclipticæ circumferri in circello. Hic primùm est computanda Prosth. latitudinis, non, usitatæ ab Ecliptica temporaria, sed tanquam ab Ecliptica media, seu à via regia, idq; in qualibet elongatione stellæ à nodo Eclipticarum; nec tantum ad propositum tempus, sed etiam ad annum 1600: de-

inde verò comparatis invicem utriusq; temporis Prosthaphæresibus, elicitur, quid mutandum sit in latit. anni 1600; ut habeatur anni propositi.

Ergò collige argumentum Obliquitatis, & ad tempus prop. & ad annum 1600 post Christum: iisque argumentis subtractis ab integro circulo, residuis nomen da, longitudo Nodi Eclipticarum ab æquinoctio, idq; ad utrunq; tempus. Has Nodi elongationes aufer à longitudine Stellæ vel Puncti, quæ competit eidem tempori (addito prius integro circulo, si opus est) ut pateat Elongatio puncti à Nodo ascendente: quæ quândiū minor est Semic. Prosth. habet à via Regia Borealem: at ubi superaverit semic. Australem. Hujus Elongationis utriusq; Log. is adde Log. um Semic. circelli, qui proprius est formæ Obliquitatis usurpatæ: Summæ ut Log. i, dant Prosth. latitudinis ad utrumq; tempus: indicantes, quid utroq; tempore fuisset addendum vel subtrahendum, si latitudinem stellæ à via Regia sciremus.

Si ergò elongationes ambæ, simul fuerint vel minores vel majores Semicirculo, subtrahæ Prosthaph. minorè à majori; sin altera minor Semic. altera major, fac summam ex junctis. Et Summæ quidem semper, differentia verò tunc, si minor est Prosth. temporis propositi, appone titulum contrarium ejus, quem habet Prosthaph. anni 1600. Sin, majorè Prosth. temporis propositi, affectio utriusq; fuerit eadem: differentia appone titulum, quem habet Prosthaphæresis anni 1600. Ita habebis arcum compositum cum suo titulo: qui rursum cum sua singulari cautione est applicand^o ad latitudines stellarum, quas illæ habent ad annum 1600. Nam si fuerit ejus plaga latitudini contraria, adde eam; sin ejusdem, subtrahæ alterum ab altero, residuū recepta affectione totius, erit latitudo stellæ ad temp^o propositum.

Sit Ex. causa, Borealis II caput. quod est anno 1600, in 14°. 40' 00". cum latitudine 10°. 2' Bor. Computabo latitudinem ejus ad tempus Hipparchi, quando stella fuit in 20°. 18' II. Sit autem nobis proposita prima forma Obliquitatis: & libretur primo Polus in circelli diametro. Sit inventa obliquitas Eclipticæ Hipparchi tempore 23°. 51'. 30". Aufer igitur Obliquitatem nostri temporis, 23°. 30'. 30". Excessus 21' 0", dat Log. um 509805, cui adde longitudinis stelle 80°. 18', Log. um 1440. Summa 511245, quaesita inter Log. os, exhibet 20°. 56'. Prosth. subtr. quia latitudo stelle est Borealis in II signo Boreali. Quare subtracta hæc Prosth. à 10°. 2', latitudine nostri temporis, relinquit 9°. 41', latitudinem ejus, tempore Hipparchi. Secundo, circumferat polus in circello, & sit rursus Forma prima. Habemus igitur longitudinē fixæ, etiam ad tempus propositum, sc. 20°. 18' II. Argumentum verò Obliquitatis est in I. forma Hipparchi tempore 339. 30. tempore nostro 215. 21, quæ subtrahò à 360, restat Nodi Eclipticarum longitudo, Hipparcho 20°. 30' V, Nobis 154°. 39' (24. 39 Ω.) Hæc aufero, quamq; à suo loco stella, veniet Elongatio stelle à Nodo. Hipparcho 59°. 48. Nobis 320°. 2'. Hæc igitur Log. is 14586, & 45314, addito Semicirculi circelli 12'. 24" Log. 0562564, summa 577150. 607878, ostendunt Prosth. 10°. 44" Bor. 7'. 53" Austr. quæ Hipparchi Elong. er at minor semicirculo, nostræ major. Sunt igitur jungendæ Prosth. in unam summam, ut sit

PRÆCEPTUM 194

Prop. præ. 193

Prop. præ. 194

ut sit

ut sit 18'. 37", quæ fortietur titulum Borealis, contrariū sc. ejus, quem habuit Prosth. ad an. 1600. Ita scimus, circa hunc stellæ locū, Eclipticam Hipp. tempore fuisse inter fixas Borealiorem quàm hodie, & id (secundum hanc quidem obliquitatis formam, & secundum hunc Poli motum) quantitate 18'. 37". Et quia composita Prosth. est Borea, latitudo stellæ proposita ad annum 1600 etiam Borea: subtrahatur igitur illa ab hac, restabit latitudo stellæ ad tempus Hipparchi 9°. 43'. 23" Borea, paulo diversa, quam per librationem poli.

In secunda forma. ut brevis sim; per circuitum poli, sit hac lat. Hipparcho 9°. 8', in III 9°. 4', in IV 9°. 34', in V. 9°. 39'. Ita formæ II. III fidem decoquunt; si qua modo fides observationibus veteribus latitudinum.

PRÆCEPTUM 195. *Stellæ fixæ, cujus est data longitudo & latitudo ad annum 1600, inquirere Declinationem & Ascensionem Rectam ad quodcumq; tempus.*

PRIMUM constituitur stellæ datæ longitudo ad tempus propositum, secundum unam ex formis quinq; Obliquitatis, quæ etiam adhibita fuit in loco Solis absolvendo. Deinde, cum hac longitudo, & cum latitudine non aliâ, quàm quæ est anni 1600, perindè ac si esset illa perpetuò invariabilis, quære Declinat. & Asc. rectam. Ita conficietur Decl. & Asc. recta, competens etiam tempori proposito.

Et si enim mutantur fortasse latitudines fixarum ab Ecliptica, id tamen fit non motu reali Fixarum, sed Eclipticæ ipsius discessione à Fixis & Equatore: ubi Fixæ & Equator, respectu quidè hujus mutationis, inter sese non connivent: itaq; Tabula Asc. Rect. & Declin. etsi constructa est ad Obliquitatem Ecl. nostri temporis, utilis tamen est ad omnia tempora pro Fixis stellis.

PRÆCEPTUM 196. *De locis Planetarum emendandis, quæ Ptolemæus observavit, ut cum calculo harum Tabularum, conferrî dextrè possint; & vicissim.*

CUM Ptolemæus id punctum fixarum habeat pro principio V, quod Sol inscendit postridie ejus diei, quo nos ex his tabulis ad illius tempora computamus verum æquinoctium; omnia ergò Planetarum loca diminuit gradu circiter uno & 3 scrupulis. Tantum igitur vel detrahe computationi harum Tabb. vel adde locis ab illo per fixas observatis: ut hodiernas obs. cum Ptolemaicis in eandem demonstrationem componere ritè possis. Non est autem, ut metuat calculator, vitium hoc unius gradus redundaturum in Eclipses, aut alios Planetarum motus. Est enim peccatum tantummodò numerationis à posteriori puncto Zodiaci inceptæ: motuum tenor manet, per hoc quidem peccatum, planè idem.

Et dictum est alibi: potuisse exerceri Astronomiam Secundorum mobilium, etsi planè ignorassemus punctum æquinoctii.

Epir. Astr. Lib. VII. fol. 923.

De Refractionibus radiorum sideralium in aère.

Catalogo Fixarum subjunxi Tabellam Refractionum triplicem, ex Tychonis Progymnasmatibus; quia idem & Gruenpergerus fecit in suâ Fixarum editione. Etsi usus Tabellæ non præcipuè refertur ad calculum harum Tabularum: ut quæ non profitentur id, quod sidera patiuntur in aère inconstanti: sed unicus est, in applicandis ad calculum observationibus. Nam si est observata sideris altitudo refractè; per altitudinem quæ sitam in margine, excerpere refractionem, ex quo filo placuerit, eamque aufer ab altitudine observata, ut fiat vera (sicut auferres parallaxin ab alt. computatâ, ut fiat apparsens) & si jam est computata longitudo & latitudo sideris, observati in refractione: cum altitudine excerpta Refractio, per angulum verticalis & Eclipticæ diducenda est in longum & latum, & quodq; ad suum congenere sic applicandum, ut id refractione liberetur, ea via, qua applicatur parallaxis, ut ex vero loco fiat visibilis. Sed cave præsumas, processum, qui Horizontalem parallaxin adhibet, etiam in Refractione experiri. Non est enim eadem utrobique; Horizontalium proportio ad cæteras.

PRÆCEPTUM 197.

Quiprac. 133 est elem. primum.

Per prac. 133

Multa de hac Tabella monere commodè possem, nisi modus operis obstaret. Hæc pauca non fuerunt omittenda. In Solis & Lunæ Refractionibus, usq; ad alt. 45 gr. continuandis, Tycho dedit aliquid disputationibus super ea re, cum Landgravio ejusq; Mathematico: non enim cõsequitur observatio tam subtilia. Diversas autem quod vides, in \odot & Fixis refractiones, diversam incrementorum seriem: ex eo fidem Tychonis perspicies; qui processum eundè distinctis temporibus, & in distinctis mobilibus, exsecutus est observando diducendoque, non respectans ad prioris processus effectum: si fortè (quod frustra tamen suspicatus est) altitudo siderum à centro terræ varia, causam pareret varietatis. Ego Refractiones Solis idèd majores factas puto, quia in iis computandis Tycho adhibuerit parallaxin \odot nimiam, quæ nimio ipsum depressit eoque; Refractio, cum etiam id nimium tollere in super putaretur, censita fuit major verâ. In Lunâ excusationem ab aère ipso peto, ut & in Sole. Nam & Lunâ plenâ & de die, ob lumen Solis præfens, aër dilatur; at Fixæ, ut plurimum in interluniis, & profunda nocte, & cælo serenissimo observantur. Præterea sat fidam esse Tabulam pro locis, si non omnibus, saltem pluribus (& aère quieto, non imminentibus tempestatibus) ex eo perspicies, quòd in Bohemiâ penè eadem observatæ, quæ in Daniâ.

TABULARUM

RUDOLPHI

ASTRONOMI-

CARUM

PARS PRIMA,

*QUÆ COMMUNIS PLURIBUS STELLIS, VEL
etiam aliis aliarum disciplinarum usibus.*

- I. HEPTACOSIAS LOGARITHMORUM LOGISTICORUM
& Quadrantis Arcuum respondentium. f. 2.
- II. CANON LOGARITHMORUM ET ANTILOGARITH-
morum, ad singula scrupula Semicirculi. f. 12.
- III. Tabula ANGULI, pro Prosthaphæresibus orbis Anni. f. 20.
- IV. Pars Canonis MESOLOGARITHMORUM ad Gr. 10, pro latitudinibus
quinq; Planetarum. f. 22.
- V. Particula Canonis ANTILOGARITHMORUM exactiorum, ad dena-
rios secundorum, pro Eclipsibus. f. 23.
- VI. Tabula Ascensionum Rectarum, Declinationum, & Angulorum Eclipticæ
cum Meridiano. f. 24.
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HEPTACOSIAS LOGARITH.

Arcus Qua- drantis. <i>Cum diffe- rentiis.</i>	Sexa- gesima scrupu- la.	Logarithmi <i>Cum diffe- rentiis.</i>	Qua- drice nae part et scrup.	Partes et Sexagesi: privativo- rum.	Arcus Qua- drantis. <i>Cum diffe- rentiis.</i>	Sexa- gesima scrupu- la.	Logarithmi <i>Cum diffe- rentiis.</i>	Qua- drice nae part et scrup.	Partes et Sexagesi: privativo- rum.
P. ' "	" "		P. ' "	P. ' "	P. ' "	" "		P. ' "	P. ' "
0. 0. 0	0. 0	Infinitum.	0. 0	Infinitum.	2. 51. 58	3. 0	299573.23	1. 12	20. 0. 0
4. 47		<i>Infinitum.</i>			4. 47		2739.88		
0. 4. 47	0. 5	657925.14	0. 2	720. 0. 0	2. 56. 45	3. 5	296833.35	1. 14	19. 27. 35
4. 46		69314.72			4. 47		2666.83		
0. 9. 33	0. 10	588610.42	0. 4	360. 0. 0	3. 1. 32	3. 10	294166.52	1. 16	18. 56. 52
4. 46		40546.51			4. 47		2597.55		
0. 14. 19	0. 15	548063.91	0. 6	240. 0. 0	3. 6. 19	3. 15	291568.97	1. 18	18. 27. 43
4. 47		28768.21			4. 46		2531.77		
0. 19. 6	0. 20	519295.70	0. 8	180. 0. 0	3. 11. 5	3. 20	289037.20	1. 20	18. 0. 0
4. 46		22314.35			4. 47		2469.27		
0. 23. 52	0. 25	496981.35	0. 10	144. 0. 0	3. 15. 52	3. 25	286567.93	1. 22	17. 33. 39
4. 47		18232.15			4. 47		2409.76		
0. 28. 39	0. 30	478749.19	0. 12	120. 0. 0	3. 20. 39	3. 30	284158.17	1. 24	17. 8. 34
4. 46		15415.07			4. 47		2353.05		
0. 33. 25	0. 35	463334.12	0. 14	102. 51. 26	3. 25. 26	3. 35	281805.12	1. 26	16. 44. 39
4. 47		13353.14			4. 47		2298.95		
0. 38. 12	0. 40	449980.98	0. 16	90. 0. 0	3. 30. 13	3. 40	279506.17	1. 28	16. 21. 49
4. 46		11778.30			4. 46		2247.28		
0. 42. 58	0. 45	438202.68	0. 18	80. 0. 0	3. 34. 59	3. 45	277258.89	1. 30	16. 0. 0
4. 47		10536.05			4. 47		2197.90		
0. 47. 45	0. 50	427666.63	0. 20	72. 0. 0	3. 39. 46	3. 50	275060.99	1. 32	15. 39. 8
4. 46		9531.03			4. 47		2150.62		
0. 52. 31	0. 55	418135.60	0. 22	65. 27. 16	3. 44. 33	3. 55	272910.37	1. 34	15. 19. 9
4. 47		8701.14			4. 47		2105.35		
0. 57. 18	1. 0	409434.46	0. 24	60. 0. 0	3. 49. 20	4. 0	270805.02	1. 36	15. 0. 0
4. 47		8004.26			4. 47		2061.95		
1. 2. 5	1. 5	401430.20	0. 26	55. 23. 5	3. 54. 7	4. 5	268743.09	1. 38	14. 41. 38
4. 46		7410.80			4. 47		2020.26		
1. 6. 51	1. 10	394019.40	0. 28	51. 25. 43	3. 58. 54	4. 10	266722.83	1. 40	14. 24. 0
4. 47		6899.23			4. 48		1980.27		
1. 11. 38	1. 15	387120.12	0. 30	48. 0. 0	4. 3. 42	4. 15	264742.56	1. 42	14. 7. 4
4. 46		6253.86			4. 47		1941.81		
1. 16. 24	1. 20	380666.26	0. 32	45. 0. 0	4. 8. 29	4. 20	262800.75	1. 44	13. 50. 47
4. 47		6062.46			4. 47		1904.81		
1. 21. 11	1. 25	374603.80	0. 34	42. 21. 11	4. 13. 16	4. 25	260895.94	1. 46	13. 35. 6
4. 46		5715.86			4. 48		1869.21		
1. 25. 57	1. 30	368887.94	0. 36	40. 0. 0	4. 18. 4	4. 30	259026.73	1. 48	13. 20. 0
4. 47		5406.71			4. 47		1834.91		
1. 30. 44	1. 35	363481.23	0. 38	37. 53. 41	4. 22. 51	4. 35	257191.82	1. 50	13. 5. 26
4. 47		5129.35			4. 47		1801.86		
1. 35. 31	1. 40	358351.90	0. 40	36. 0. 0	4. 27. 38	4. 40	255389.96	1. 52	12. 51. 25
4. 46		4879.02			4. 48		1769.96		
1. 40. 17	1. 45	353472.88	0. 42	34. 17. 9	4. 32. 26	4. 45	253620.00	1. 54	12. 37. 53
4. 47		4652.00			4. 47		1739.17		
1. 45. 4	1. 50	348820.88	0. 44	32. 43. 38	4. 37. 13	4. 50	251880.83	1. 56	12. 24. 50
4. 47		4445.17			4. 48		1709.45		
1. 49. 51	1. 55	344375.71	0. 46	31. 18. 16	4. 42. 1	4. 55	250171.38	1. 58	12. 12. 12
4. 46		4255.97			4. 47		1680.71		
1. 54. 57	2. 0	340119.74	0. 48	30. 0. 0	4. 46. 48	5. 0	248490.67	2. 0	12. 0. 0
4. 47		4082.19			4. 48		1652.93		
1. 59. 34	2. 5	336037.55	0. 50	28. 48. 0	4. 51. 36	5. 5	246837.74	2. 2	11. 48. 12
4. 47		3922.07			4. 47		1626.06		
2. 4. 11	2. 10	332115.48	0. 52	27. 41. 32	4. 56. 23	5. 10	245211.68	2. 4	11. 36. 47
4. 47		3774.03			4. 48		1600.03		
2. 8. 58	2. 15	328341.45	0. 54	26. 40. 0	5. 1. 11	5. 15	243611.65	2. 6	11. 25. 43
4. 46		3656.77			4. 48		1574.83		
2. 13. 44	2. 20	324704.68	0. 56	25. 42. 52	5. 5. 59	5. 20	242036.82	2. 8	11. 15. 0
4. 47		3509.14			4. 47		1550.42		
2. 18. 31	2. 25	321195.54	0. 58	24. 49. 39	5. 10. 46	5. 25	240486.40	2. 10	11. 4. 37
4. 47		3399.14			4. 48		1526.75		
2. 23. 18	2. 30	317805.40	1. 0	24. 0. 0	5. 15. 34	5. 30	238959.65	2. 12	10. 54. 33
4. 47		3278.99			4. 47		1503.78		
2. 28. 5	2. 35	314526.41	1. 2	23. 13. 33	5. 20. 21	5. 35	237455.87	2. 14	10. 44. 47
4. 46		3174.87			4. 48		1481.51		
2. 32. 51	2. 40	311351.54	1. 4	22. 30. 0	5. 25. 9	5. 40	235974.36	2. 16	10. 35. 18
4. 47		3077.17			4. 48		1459.90		
2. 37. 38	2. 45	308274.37	1. 6	21. 49. 5	5. 29. 57	5. 45	234514.40	2. 18	10. 26. 5
4. 47		2983.29			4. 47		1438.86		
2. 42. 25	2. 50	305289.08	1. 8	21. 10. 35	5. 34. 44	5. 50	233075.60	2. 20	01. 17. 9
4. 47		2898.75			4. 48		1418.46		
2. 47. 12	2. 55	302390.33	1. 10	20. 34. 17	5. 39. 32	5. 55	231657.14	2. 22	10. 8. 27
4. 46		2817.10			4. 48		1398.64		
2. 51. 58	3. 0	299573.23	1. 12	20. 0. 0	5. 44. 20	6. 0	230258.51	2. 24	10. 0. 0

MORVM LOGISTICORVM.

Arcus Quadrantis. Cum differentia.		Sexagesima scrupula.	Logarithmi Cum differentia.	Quadrivice nae part et scrup.	Partes et Sexagesi. privativo rum.	Arcus Qua- drantis. Cum diffe- rentiis		Sexa- gesima scrupu- la.	Logarithmi Cum diffe- rentiis.	Qua- drivice nae part et scrup.	Partes et Sexagesi. privativo rum.
P.	''	''		P.	P.	P.	''	''		P.	P.
5.44.20	4.48	6.0	230258.51	2.24	10.0.0	8.37.36	4.50	9.0	189712.00	3.36	6.40.0
5.49.8	4.48	6.5	228879.19	2.26	9.51.47	8.42.26	4.50	9.5	188790.34	3.38	6.36.21
5.53.56	4.47	6.10	227518.63	2.28	9.43.47	8.47.16	4.51	9.10	187877.09	3.40	6.32.44
5.58.43	4.48	6.15	226176.33	2.30	9.36.0	8.52.7	4.50	9.15	186972.11	3.42	6.29.11
6.3.31	4.48	6.20	224851.80	2.32	9.28.25	8.56.57	4.50	9.20	186075.24	3.44	6.25.43
6.8.19	4.48	6.25	223544.60	2.34	9.21.1	9.1.47	4.51	9.25	185186.35	3.46	6.22.18
6.13.7	4.48	6.30	222254.25	2.36	9.13.51	9.6.38	4.50	9.30	184305.28	3.48	6.18.57
6.17.55	4.48	6.35	220980.34	2.38	9.6.51	9.11.28	4.50	9.35	183431.92	3.50	6.15.39
6.22.43	4.48	6.40	219722.48	2.40	9.0.0	9.16.18	4.50	9.40	182566.11	3.52	6.12.25
6.27.31	4.49	6.45	218480.22	2.42	8.53.20	9.21.8	4.51	9.45	181707.73	3.54	6.9.14
6.32.20	4.48	6.50	217253.21	2.44	8.46.50	9.25.59	4.50	9.50	180856.66	3.56	6.6.6
6.37.8	4.48	6.55	216041.08	2.46	8.40.29	9.30.49	4.50	9.55	180012.78	3.58	6.3.2
6.41.56	4.49	7.0	214843.45	2.48	8.34.17	9.35.39	4.51	10.0	179175.95	4.0	6.0.0
6.46.45	4.49	7.5	213660.02	2.50	8.28.14	9.40.30	4.50	10.5	178346.07	4.2	5.57.1
6.51.34	4.48	7.10	212490.40	2.52	8.22.19	9.45.20	4.51	10.10	177523.02	4.4	5.54.6
6.56.22	4.49	7.15	211334.32	2.54	8.16.33	9.50.11	4.50	10.15	176706.69	4.6	5.51.13
7.1.11	4.49	7.20	210191.45	2.56	8.10.55	9.55.1	4.51	10.20	175896.97	4.8	5.48.23
7.6.0	4.49	7.25	209061.50	2.58	8.5.23	9.59.52	4.51	10.25	175093.76	4.10	5.45.36
7.10.49	4.49	7.30	207944.16	3.0	8.0.0	10.4.43	4.51	10.30	174296.93	4.12	5.42.51
7.15.38	4.49	7.35	206839.18	3.2	7.54.43	10.9.34	4.51	10.35	173506.41	4.14	5.40.9
7.20.27	4.49	7.40	205746.27	3.4	7.49.34	10.14.25	4.52	10.40	172722.10	4.16	5.37.30
7.25.16	4.49	7.45	204665.17	3.6	7.44.31	10.19.17	4.51	10.45	171943.89	4.18	5.34.53
7.30.5	4.49	7.50	203595.65	3.8	7.39.35	10.24.8	4.51	10.50	171171.68	4.20	5.32.18
7.34.54	4.49	7.55	202537.43	3.10	7.34.44	10.28.59	4.52	10.55	170405.39	4.22	5.29.46
7.39.43	4.49	8.0	201490.30	3.12	7.30.0	10.33.51	4.51	11.0	169644.93	4.24	5.27.16
7.44.32	4.50	8.5	200454.03	3.14	7.25.22	10.38.42	4.52	11.5	168890.21	4.26	5.24.48
7.49.20	4.49	8.10	199428.38	3.16	7.20.49	10.43.34	4.52	11.10	168141.14	4.28	5.22.23
7.54.9	4.49	8.15	198413.14	3.18	7.16.22	10.48.26	4.51	11.15	167397.64	4.30	5.20.0
7.58.58	4.50	8.20	197408.11	3.20	7.12.0	10.53.17	4.52	11.20	166659.63	4.32	5.17.39
8.3.48	4.49	8.25	196413.08	3.22	7.7.44	10.58.9	4.52	11.25	165927.03	4.34	5.15.20
8.8.37	4.50	8.30	195427.85	3.24	7.3.32	11.2.1	4.51	11.30	165199.75	4.36	5.13.2
8.13.27	4.49	8.35	194452.23	3.26	6.59.25	11.7.52	4.52	11.35	164477.73	4.38	5.10.48
8.18.16	4.50	8.40	193486.04	3.28	6.55.23	11.12.44	4.52	11.40	163760.88	4.40	5.8.34
8.23.6	4.50	8.45	192529.09	3.30	6.51.26	11.17.36	4.52	11.45	163049.14	4.42	5.6.23
8.27.56	4.50	8.50	191581.22	3.32	6.47.33	11.22.28	4.52	11.50	162342.42	4.44	5.4.14
8.32.46	4.50	8.55	190642.24	3.34	6.43.44	11.27.20	4.53	11.55	161640.64	4.46	5.2.5
8.37.36		9.0	189712.00	3.36	6.40.0	11.32.13		12.0	160943.79	4.48	5.0.0

HEPTACOSIAS LOGARITH.

Arcus Qua- drantis. <i>Cum diffe- rentiis.</i>	Sexa- gesima scrupu- la.	Logarithmi <i>Cum diffe- rentiis.</i>	Qua- drice nae part et scrup.	Partes et Sexagesi- privativo rum.	Arcus Qua- drantis. <i>Cum diffe- rentiis.</i>	Sexa- gesima scrupu- la.	Logarithmi <i>Cum diffe- rentiis.</i>	Qua- drice nae part et scrup.	Partes et Sexagesi- privativo rum.
P. ' "	' "		P. ' "	P. ' "	P. ' "	' "		P. ' "	P. ' "
11.32.13 4.52	12. 0	160943.79 692.05	4.48	5. 0. 0	14.28.39 4.56	15. 0	138629.44 554.00	6. 0	4. 0. 0
11.37. 5 4.52	12. 5	160251.74 687.29	4.50	4.57.56	14.33.35 4.57	15. 5	138075.44 550.97	6. 2	3.58.41
11.41.57 4.53	12.10	159564.45 682.59	4.52	4.55.54	14.38.32 4.56	15.10	137524.47 547.95	6. 4	3.57.22
11.46.50 4.52	12.15	158881.86 677.97	4.54	4.53.53	14.43.28 4.56	15.15	136976.52 544.97	6. 6	3.56. 4
11.51.42 4.53	12.20	158203.89 673.40	4.56	4.51.54	14.48.24 4.57	15.20	136431.55 542.01	6. 8	3.54.47
11.56.35 4.53	12.25	157530.49 668.90	4.58	4.49.56	14.53.21 4.56	15.25	135889.54 539.08	6.10	3.53.31
12. 1.28 4.53	12.30	156861.59 664.45	5. 0	4.48. 0	14.58.17 4.57	15.30	135350.46 536.20	6.12	3.52.16
12. 6.21 4.54	12.35	156197.14 660.07	5. 2	4.46. 5	15. 3.14 4.57	15.35	134814.26 533.34	6.14	3.51. 1
12.11.15 4.53	12.40	155537.07 655.74	5. 4	4.44.13	15. 8.11 4.57	15.40	134280.92 530.51	6.16	3.49.47
12.16. 8 4.53	12.45	154881.33 651.47	5. 6	4.42.21	15.13. 8 4.57	15.45	133750.41 527.71	6.18	3.48.34
12.21. 1 4.54	12.50	154229.86 647.26	5. 8	4.40.30	15.18. 5 4.58	15.50	133222.70 524.94	6.20	3.47.22
12.25.55 4.53	12.55	153582.60 643.08	5.10	4.38.43	15.23. 3 4.57	15.55	132697.76 522.19	6.22	3.46.11
12.30.48 4.53	13. 0	152939.52 638.98	5.12	4.36.55	15.28. 0 4.57	16. 0	132175.57 519.48	6.24	3.45. 0
12.35.41 4.54	13. 5	152300.54 634.93	5.14	4.35.10	15.32.57 4.57	16. 5	131656.09 516.80	6.26	3.43.50
12.40.35 4.53	13.10	151665.61 630.91	5.16	4.33.26	15.37.54 4.58	16.10	131139.29 514.14	6.28	3.42.41
12.45.28 4.54	13.15	151034.70 626.97	5.18	4.31.42	15.42.52 4.57	16.15	130625.15 511.51	6.30	3.41.32
12.50.22 4.53	13.20	150407.73 623.05	5.20	4.30. 0	15.47.49 4.58	16.20	130113.64 508.89	6.32	3.40.24
12.55.15 4.54	13.25	149784.68 619.20	5.22	4.28.19	15.52.47 4.57	16.25	129604.75 506.34	6.34	3.39.17
13. 0. 9 4.54	13.30	149165.49 615.38	5.24	4.26.40	15.57.44 4.58	16.30	129098.41 503.78	6.36	3.38.12
13. 5. 3 4.54	13.35	148550.11 611.62	5.26	4.25. 2	16. 2.42 4.58	16.35	128594.63 501.25	6.38	3.37. 5
13. 9.57 4.55	13.40	147938.49 607.91	5.28	4.23.25	16. 7.40 4.58	16.40	128093.38 498.75	6.40	3.36. 0
13.14.52 4.54	13.45	147330.58 604.23	5.30	4.21.49	16.12.38 4.59	16.45	127594.63 496.28	6.42	3.34.56
13.19.46 4.55	13.50	146726.35 600.60	5.32	4.20.15	16.17.37 4.58	16.50	127098.35 493.83	6.44	3.33.52
13.24.41 4.55	13.55	146125.75 597.01	5.34	4.18.41	16.22.35 4.59	16.55	126604.52 491.40	6.46	3.32.49
13.29.36 4.54	14. 0	145528.74 593.48	5.36	4.17. 9	16.27.34 4.59	17. 0	126113.12 489.00	6.48	3.31.46
12.34.30 4.55	14. 5	144935.26 589.97	5.38	4.15.37	16.32.33 4.59	17. 5	125624.12 486.62	6.50	3.30.44
13.39.25 4.55	14.10	144345.29 586.51	5.40	4.14. 7	16.37.32 5. 0	17.10	125137.50 484.26	6.52	3.29.43
13.44.20 4.55	14.15	143758.78 583.10	5.42	4.12.38	16.42.32 4.59	17.15	124653.24 481.94	6.54	3.28.42
13.49.15 4.56	14.20	143175.68 579.72	5.44	4.11. 9	16.47.31 4.59	17.20	124171.30 479.62	6.56	3.27.42
13.54.11 4.55	14.25	142595.96 576.36	5.46	4. 9.42	16.52.30 5. 0	17.25	123691.68 477.32	6.58	3.26.42
13.19. 6 4.55	14.30	142019.60 573.07	5.48	4. 8.17	16.57.30 4.59	17.30	123214.36 475.06	7. 0	3.25.43
15. 4. 1 4.56	14.35	141446.53 569.81	5.50	4. 6.51	17. 2.29 5. 0	17.35	122739.30 472.82	7. 2	3.24.44
14. 8.57 4.55	14.40	140876.72 566.57	5.52	4. 5.27	17. 7.29 4.59	17.40	122266.48 470.58	7. 4	3.23.46
14.13.52 4.55	14.45	140310.15 563.38	5.54	4. 4. 4	17.12.28 5. 0	17.45	121795.90 468.37	7. 6	3.22.49
14.18.47 4.56	14.50	139746.77 560.22	5.56	4. 2.42	17.17.28 5. 0	17.50	121327.53 466.20	7. 8	3.21.52
14.23.43 4.56	14.55	139186.55 557.11	5.58	4. 1.20	17.22.28 4.59	17.55	120861.33 464.05	7.10	3.20.56
14.28.39	15. 0	138629.44	6. 0	4. 0. 0	17.27.27	18. 0	120397.28	7.12	3.20. 0

MORVM LOGISTICORVM.

Arcus Qua- drantis. Cum diffe- rentiis.	Sexa- gesima scrupu- la.	Logarithmi Cum diffe- rentiis.	Qua- drivice nae part et scrup.	Partes et Sexagesi- privativo- rum.	Arcus Qua- drantis. Cum diffe- rentiis.	Sexa- gesima scrupu- la.	Logarithmi Cum diffe- rentiis.	Qua- drivice nae part et scrup.	Partes et Sexagesi- privativo- rum.
P. ' "	' "		P. ' "	P. ' "	P. ' "	' "		P. ' "	P. ' "
17.27.27	18. 0	120397.28	7.12	3.20. 0	20.29.14	21. 0	104982.21	8.24	2.51.26
5. 0		461.89			5. 5		396.04		
17.32.27	18. 5	119935.39	7.14	3.19. 5	20.34.19	21. 5	104586.17	8.26	2.50.44
5. 0		459.77			5. 5		394.48		
17.37.27	18.10	119475.62	7.16	3.18.11	20.39.24	21.10	104191.69	8.28	2.50. 4
5. 1		457.67			5. 6		392.94		
17.42.28	18.15	119017.95	7.18	3.17.17	20.44.30	21.15	103798.75	8.30	2.49.25
5. 1		455.58			5. 6		391.37		
17.47.29	18.20	118562.37	7.20	3.16.22	20.49.36	21.20	103407.38	8.32	2.48.45
5. 1		453.52			5. 6		389.87		
17.52.30	18.25	118108.85	7.22	3.15.30	20.54.42	21.25	103017.51	8.34	2.48. 6
5. 2		451.46			5. 6		388.34		
17.57.32	18.30	117657.39	7.24	3.14.37	20.59.48	21.30	102629.17	8.36	2.47.27
5. 2		449.44			5. 6		386.82		
18. 2.33	18.35	117207.95	7.26	3.13.44	21. 4.54	21.35	102242.31	8.38	2.46.48
5. 2		447.43			5. 7		385.35		
18. 7.35	18.40	116760.52	7.28	3.12.52	21.10. 1	21.40	101856.96	8.40	2.46. 9
5. 1		445.43			5. 7		383.89		
18.12.36	18.45	116315.09	7.30	3.12. 0	21.15. 8	21.45	101473.07	8.42	2.45.31
5. 2		443.46			5. 7		382.40		
18.17.38	18.50	115871.63	7.32	3.11. 9	21.20.15	21.50	101090.67	8.44	2.44.53
5. 1		441.50			5. 8		380.97		
18.22.39	18.55	115430.13	7.34	3.10.18	21.25.23	21.55	100709.70	8.46	2.44.15
5. 2		439.57			5. 8		379.49		
18.27.41	19. 0	114990.56	7.36	3. 9.28	21.30.31	22. 0	100330.21	8.48	2.43.38
5. 2		437.63			5. 8		378.08		
18.32.43	19. 5	114552.93	7.38	3. 8.39	21.35.39	22. 5	99952.13	8.50	2.43. 1
5. 3		435.73			5. 9		376.64		
18.37.46	19.10	114117.20	7.40	3. 7.50	21.40.48	22.10	99575.49	8.52	2.42.24
5. 2		433.84			5. 9		375.24		
18.42.48	19.15	113683.36	7.42	3. 7. 1	21.45.57	22.15	99200.25	8.54	2.41.48
5. 3		431.97			5.10		373.82		
18.47.51	19.20	113251.39	7.44	3. 6.13	21.51. 7	22.20	98825.42	8.56	2.41.12
5. 3		430.11			5. 9		372.44		
18.52.54	19.25	112821.28	7.46	3. 5.24	21.56.16	22.25	98453.98	8.58	2.40.36
5. 3		428.27			5.10		371.05		
18.57.57	19.30	112393.01	7.48	3. 4.36	22. 1.26	22.30	98082.93	9. 0	2.40. 0
5. 4		426.45			5. 9		369.69		
19. 3. 1	19.35	111966.56	7.50	3. 3.50	22. 6.35	22.35	97713.24	9. 2	2.39.24
5. 3		424.63			5.10		368.33		
19. 8. 4	19.40	111541.93	7.52	3. 3. 3	22.11.45	22.40	97344.91	9. 4	2.38.49
5. 3		422.83			5.10		366.98		
19.13. 7	19.45	111119.10	7.54	3. 2.17	22.16.55	22.45	96977.93	9. 6	2.38.15
5. 4		421.05			5.10		365.63		
19.18.11	19.50	110698.05	7.56	3. 1.31	22.22. 5	22.50	96612.30	9. 8	2.37.40
5. 4		419.29			5.11		364.29		
19.23.15	19.55	110278.76	7.58	3. 0.45	22.27.16	22.55	96248.01	9.10	2.37. 5
5. 4		417.54			5.10		362.96		
19.28.19	20. 0	109861.22	8. 0	3. 0. 0	22.32.26	23. 0	95885.05	9.12	2.36.31
5. 4		415.80			5.10		361.63		
19.33.23	20. 5	109445.42	8. 2	2.59.15	22.37.36	23. 5	95523.40	9.14	2.35.57
5. 5		414.08			5.11		360.33		
19.38.28	20.10	109031.34	8. 4	2.58.31	22.42.47	23.10	95163.05	9.16	2.35.24
5. 4		412.37			5.10		359.06		
17.43.32	20.15	108618.97	8. 6	2.57.47	22.47.57	23.15	94803.99	9.18	2.34.50
5. 4		410.68			5.11		357.78		
19.48.36	20.20	108208.29	8. 8	2.57. 3	22.53. 8	23.20	94446.21	9.20	2.34.17
5. 5		408.99			5.11		356.51		
19.53.41	20.25	107799.30	8.10	2.56.20	22.58.19	23.25	94089.70	9.22	2.33.43
5. 4		407.34			5.11		355.25		
19.58.45	20.30	107391.96	8.12	2.55.37	23. 3.30	23.30	93734.45	9.24	2.33.12
5. 4		405.68			5.12		353.99		
20. 3.49	20.35	106986.28	8.14	2.54.55	23. 8.42	23.35	93380.46	9.26	2.32.40
5. 4		404.04			5.11		352.74		
20. 8.53	20.40	106582.24	8.16	2.54.12	23.13.53	23.40	93027.72	9.28	2.32. 7
5. 5		402.41			5.12		351.50		
20.13.58	20.45	106179.83	8.18	2.53.30	23.19. 5	23.45	92676.22	9.30	2.31.35
5. 5		400.80			5.12		350.27		
20.19. 3	20.50	105779.03	8.20	2.52.48	23.24.17	23.50	92325.95	9.32	2.31. 3
5. 5		399.21			5.12		349.04		
20.24. 8	20.55	105379.82	8.22	2.52. 6	23.29.29	23.55	91976.91	9.34	2.30.31
5. 6		397.61			5.13		347.83		
20.29.14	21. 0	104982.21	8.24	2.51.26	23.34.42	24. 0	91629.08	9.36	2.30. 0

HEPTACOSIAS LOGARITH.

Arcus Qua- drantis. <i>Cum diffe- rentiis.</i>	Sexa- gesima scrupu- la.	Logarithmi <i>Cum diffe- rentiis.</i>	Qua- drivice nae part et scru.	Partes et Sexagesi: privativo- rum.	Arcus Qua- drantis. <i>Cum diffe- rentiis.</i>	Sexa- gesima scrupu- la.	Logarithmi <i>Cum diffe- rentiis.</i>	Qua- drivice nae part et scru.	Partes et Sexagesi: privativo- rum.
P. ' "	' "		P. ' "	P. ' "	P. ' "	' "		P. ' "	P. ' "
23.34.42 5.13	24. 0	91629.08 346.62	9.36	2.30. 0	26.44.37 5.21	27. 0	79850.77 308.16	10.48	2.13.20
23.39.53 5.13	24. 5	91282.46 345.43	9.38	2.29.29	26.49.58 5.22	27. 5	79542.61 307.22	10.50	2.12.56
23.45. 8 5.14	24.10	90937.03 344.23	9.40	2.28.58	26.55.20 5.21	27.10	79235.39 306.28	10.52	2.12.31
23.50.22 5.13	24.15	90592.80 343.06	9.42	2.28.28	27. 0.41 5.22	27.15	78929.11 305.34	10.54	2.12. 7
23.55.35 5.13	24.20	90249.74 341.88	9.44	2.27.57	27. 6. 3 5.22	27.20	78623.77 304.42	10.56	2.11.43
24. 0.48 5.14	24.25	89907.86 340.71	9.46	2.27.27	27.11.25 5.22	27.25	78319.35 303.49	10.58	2.11.19
24. 6. 2 5.14	24.30	89567.15 339.57	9.48	2.26.57	27.16.47 5.23	27.30	78015.86 302.57	11. 0	2.10.55
24.11.16 5.14	24.35	89227.58 338.40	9.50	2.26.26	27.22.10 5.22	27.35	77713.29 301.66	11. 2	2.10.32
24.16.30 5.15	24.40	88889.18 337.27	9.52	2.25.57	27.27.32 5.23	27.40	77411.63 300.75	11. 4	2.10. 8
24.21.45 5.14	24.45	88551.91 336.13	9.54	2.25.28	27.32.55 5.23	27.45	77110.88 299.85	11. 6	2. 9.45
24.26.59 5.15	24.50	88215.78 335.01	9.56	2.24.58	27.38.18 5.24	27.50	76811.03 298.96	11. 8	2. 9.21
24.32.14 5.15	24.55	87880.77 333.89	9.58	2.24.29	27.43.42 5.24	27.55	76512.07 298.06	11.10	2. 8.57
24.37.29 5.15	25. 0	87546.88 332.78	10. 0	2.24. 0	27.49. 6 5.24	28. 0	76214.01 297.18	11.12	2. 8.34
24.42.44 5.16	25. 5	87214.10 331.67	10. 2	2.23.31	27.54.30 5.24	28. 5	75916.83 296.30	11.14	2. 8.12
24.48. 0 5.15	25.10	86882.43 330.58	10. 4	2.23. 2	27.59.54 5.25	28.10	75620.53 295.42	11.16	2. 7.49
24.53.15 5.16	25.15	86551.85 329.49	10. 6	2.22.34	28. 5.19 5.25	28.15	75325.11 294.55	11.18	2. 7.26
24.58.31 5.16	25.20	86222.36 328.41	10. 8	2.22. 6	28.10.44 5.25	28.20	75030.56 293.68	11.20	2. 7. 4
25. 3.47 5.16	25.25	85893.95 327.33	10.10	2.21.38	28.16. 9 5.26	28.25	74736.88 292.84	11.22	2. 6.41
25. 9. 3 5.17	25.30	85566.62 326.27	10.12	2.21.10	28.21.35 5.26	28.30	74444.04 291.98	11.24	2. 6.19
25.14.20 5.16	25.35	85240.35 325.20	10.14	2.20.43	28.27. 1 5.26	28.35	74152.06 291.13	11.26	2. 5.56
25.19.36 5.17	25.40	84915.15 324.15	10.16	2.20.15	28.32.27 5.26	28.40	73860.93 290.28	11.28	2. 5.34
25.24.53 5.17	25.45	84591.00 323.10	10.18	2.19.48	28.37.53 5.27	28.45	73570.65 289.43	11.30	2. 5.12
25.30.10 5.17	25.50	84267.90 322.07	10.20	2.19.21	28.43.20 5.27	28.50	73281.22 288.59	11.32	2. 4.51
25.35.27 5.18	25.55	83945.83 321.02	10.22	2.18.55	28.48.47 5.27	28.55	72992.63 287.76	11.34	2. 4.29
25.40.45 5.18	26. 0	83624.81 320.00	10.24	2.18.28	28.54.14 5.27	29. 0	72704.87 286.94	11.36	2. 4. 8
25.46. 3 5.18	26. 5	83304.81 318.98	10.26	2.18. 2	29. 0.41 5.28	29. 5	72417.93 286.12	11.38	2. 3.46
25.51.21 5.19	26.10	82985.83 317.97	10.28	2.17.36	29. 5. 9 5.28	29.10	72131.81 285.31	11.40	2. 3.26
25.56.40 5.18	26.15	82667.86 316.96	10.30	2.17. 9	29.10.37 5.27	29.15	71846.50 284.50	11.42	2. 3. 5
26. 1.58 5.19	26.20	82350.90 315.95	10.32	2.16.44	29.16. 4 5.29	29.20	71562.00 283.69	11.44	2. 2.44
26. 7.17 5.19	26.25	82034.95 314.96	10.34	2.16.18	29.21.33 5.29	29.25	71278.31 282.88	11.46	2. 2.23
26.12.36 5.19	26.30	81719.99 313.98	10.36	2.15.52	29.27. 2 5.30	29.30	70995.43 282.08	11.48	2. 2. 2
26.17.55 5.20	26.35	81406.01 312.98	10.38	2.15.26	29.32.31 5.30	29.35	70713.35 281.30	11.50	2. 1.41
26.23.15 5.20	26.40	81093.02 312.04	10.40	2.15. 0	29.38. 1 5.29	29.40	70432.05 280.50	11.52	2. 1.21
26.28.35 5.21	26.45	80781.01 311.04	10.42	2.14.35	29.43.30 5.30	29.45	70151.55 279.72	11.54	2. 1. 1
26.33.56 5.20	26.50	80469.97 310.08	10.44	2.14.10	29.49. 0 5.30	29.50	69871.83 278.94	11.56	2. 0.41
26.39.16 5.21	26.55	80159.89 309.12	10.46	2.13.45	29.54.30 5.30	29.55	69592.89 278.17	11.58	2. 0.20
26.44.37	27. 0	79850.77	10.48	2.13.20	30. 0. 0	30. 0	69314.72	12. 0	2. 0. 0

MORVM LOGISTICORVM.

Arcus Qua- drantis. <i>Cum diffe- rentiis.</i>	Sexa- gesima scrupu- la.	Logarithmi <i>Cum diffe- rentiis.</i>	Qua- drivice nae part et scrup.	Partes et Sexagesi- privativo rum.	Arcus Qua- drantis. <i>Cum diffe- rentiis.</i>	Sexa- gesima scrupu- la.	Logarithmi <i>Cum diffe- rentiis.</i>	Qua- drivice nae part et scrup.	Partes et Sexagesi- privativo rum.
P. ' "	" "		P. ' "	P. ' "	P. ' "	" "		P. ' "	P. ' "
30. 0. 0	30. 0	69314.72	12. 0	2. 0. 0	33.22. 1	33. c	59783.71	13.12	1.49. 5
5.31		277.39			5.43		252.21		
30. 5.31	30. 5	69037.33	12. 2	1.59.40	33.27.44	33. 5	59531.50	13.14	1.48.49
5.31		276.61			5.44		251.57		
30.11. 2	30.10	68760.72	12. 4	1.59.21	33.33.28	33.10	59279.93	13.16	1.48.33
5.31		275.86			5.44		250.95		
30.16.33	30.15	68484.86	12. 6	1.59. 1	33.39.12	33.15	59028.98	13.18	1.48.17
5.32		275.11			5.44		250.30		
30.22. 5	30.20	68209.75	12. 8	1.58.42	33.44.56	33.20	58778.68	13.20	1.48. 0
5.32		274.35			5.45		249.69		
30.27.37	30.25	67935.40	12.10	1.58.22	33.50.41	33.25	58528.99	13.22	1.47.44
5.32		273.60			5.45		249.06		
30.33. 9	30.30	67661.80	12.12	1.58. 3	33.56.26	33.30	58279.93	13.24	1.47.28
5.33		272.85			5.45		248.45		
30.38.42	30.35	67388.95	12.14	1.57.44	34. 2.11	33.35	58031.48	13.26	1.47.12
5.33		272.11			5.46		247.83		
30.44.15	30.40	67116.84	12.16	1.57.25	34. 7.57	33.40	57783.65	13.28	1.46.56
5.33		271.37			5.46		247.22		
30.49.48	30.45	66845.47	12.18	1.57. 5	34.13.43	33.45	57536.43	13.30	1.46.40
5.34		270.64			5.47		246.61		
30.55.22	30.50	66574.83	12.20	1.56.46	34.19.30	33.50	57289.82	13.32	1.46.24
5.34		269.91			5.47		246.01		
32. 0.56	30.55	66304.92	12.22	1.56.27	34.25.17	33.55	57043.81	13.34	1.46. 8
5.35		269.18			5.47		245.41		
31. 6.31	31. 0	66035.74	12.24	1.56. 8	34.31. 4	34. 0	56798.40	13.36	1.45.53
5.35		268.46			5.48		244.80		
31.12. 6	31. 5	65767.28	12.26	1.55.49	34.36.52	34. 5	56553.60	13.38	1.45.37
5.35		267.74			5.48		244.20		
31.17.41	31.10	65499.54	12.28	1.55.30	34.42.40	34.10	56309.40	13.40	1.45.22
5.36		267.02			5.49		243.60		
31.23.17	31.15	65232.52	12.30	1.55.12	34.48.29	34.15	56065.80	13.42	1.45. 7
5.36		266.31			5.49		243.02		
31.28.53	31.20	64966.21	12.32	1.54.54	34.54.18	34.20	55822.78	13.44	1.44.51
5.36		265.61			5.50		242.43		
31.34.29	31.25	64700.60	12.34	1.54.35	35. 0. 8	34.25	55580.35	13.46	1.44.36
5.37		264.90			5.50		241.83		
31.40. 6	31.30	64435.70	12.36	1.54.17	35. 5.58	34.30	55338.52	13.48	1.44.21
5.37		264.20			5.51		241.25		
31.45.43	31.35	64171.50	12.38	1.53.59	35.11.49	34.35	55097.27	13.50	1.44. 6
5.37		263.51			5.51		240.68		
31.51.20	31.40	63907.99	12.40	1.53.41	35.17.40	34.40	54856.59	13.52	1.43.51
5.37		262.81			5.51		240.09		
31.56.57	31.45	63645.18	12.42	1.53.23	35.23.31	34.45	54616.50	13.54	1.43.36
5.38		262.13			5.52		239.53		
32. 2.35	31.50	63383.05	12.44	1.53. 5	35.29.23	34.50	54376.97	13.56	1.43.21
5.38		261.44			5.52		238.95		
32. 8.13	31.55	63121.61	12.46	1.52.47	35.35.15	34.55	54138.02	13.58	1.43. 7
5.38		260.75			5.52		238.38		
32.13.51	32. 0	62860.86	12.48	1.52.30	35.41. 7	35. 0	53899.64	14. 0	1.42.52
5.39		260.07			5.53		237.82		
32.19.30	32. 5	62600.79	12.50	1.52.13	35.47. 0	35. 5	53661.82	14. 2	1.42.37
5.39		259.41			5.53		237.25		
32.25. 9	32.10	62341.38	12.52	1.51.55	35.52.53	35.10	53424.57	14. 4	1.42.22
5.39		258.73			5.54		236.68		
32.30.48	32.15	62082.65	12.54	1.51.38	35.58.47	35.15	53187.89	14. 6	1.42. 8
5.40		258.07			5.54		236.12		
32.36.28	32.20	61824.58	12.56	1.51.21	36. 4.41	35.20	52951.77	14. 8	1.41.53
5.40		257.40			5.55		235.56		
32.42. 8	32.25	61567.18	12.58	1.51. 3	36.10.36	35.25	52716.21	14.10	1.41.39
5.41		256.74			5.55		235.02		
32.47.49	32.30	61310.44	13. 0	1.50.46	36.16.31	35.30	52481.19	14.12	1.41.25
5.41		256.08			5.56		234.48		
32.53.30	32.35	61054.36	13. 2	1.50.29	36.22.27	35.35	52246.71	14.14	1.41.10
5.41		255.43			5.56		233.92		
32.59.11	32.40	60798.93	13. 4	1.50.12	36.28.23	35.40	52012.79	14.16	1.40.56
5.42		254.77			5.57		233.38		
33. 4.53	32.45	60544.16	13. 6	1.49.55	36.34.20	35.45	51779.41	14.18	1.40.42
5.42		254.13			5.57		232.82		
33.10.35	32.50	60290.03	13. 8	1.49.38	36.40.17	35.50	51546.59	14.20	1.40.28
5.42		253.48			5.58		232.28		
33.16.18	32.55	60036.55	13.10	1.49.22	36.46.15	35.55	51314.31	14.22	1.40.14
5.43		252.84			5.58		231.75		
33.22. 1	33. 0	59783.71	13.12	1.49. 5	36.52.13	36. 0	51082.56	14.24	1.40. 0

HEPTACOSIAS LOGARITH.

Arcus Qua- drantis. <i>Cum diffe- rentiis.</i>	Sexa- gesima scrupu- la.	Logarithmi <i>Cum diffe- rentiis.</i>	Qua- drivice nae part et scrup.	Partes et Sexagesi: privativo rum.	Arcus Qua- drantis. <i>Cum diffe- rentiis.</i>	Sexa- gesima scrupu- la.	Logarithmi <i>Cum diffe- rentiis.</i>	Qua- drivice nae part et scrup.	Partes et Sexagesi: privativo rum.
P. ' "	' "		P. ' "	P. ' "	P. ' "	' "		P. ' "	P. ' "
36.52.13 5.58	36. 0	51082.56 231.21	14.24	1.40. 0	40.32.30 6.17	39. 0	43078.29 213.45	15.36	1.32.18
36.58.11 5.59	36. 5	50851.35 230.69	14.26	1.39.46	40.38.47 6.18	39. 5	42864.84 212.99	15.38	1.32. 6
37. 4.10 5.59	36.10	50620.66 230.15	14.28	1.39.32	40.45. 5 6.18	39.10	42651.85 212.54	15.40	1.31.54
37.10. 9 6. 0	36.15	50390.51 229.63	14.30	1.39.19	40.51.23 6.19	39.15	42439.31 212.09	15.42	1.31.42
37.16. 9 6. 0	36.20	50160.88 229.09	14.32	1.39. 5	40.57.42 6.20	39.20	42227.22 211.64	15.44	1.31.31
37.22. 9 6. 0	36.25	49931.79 228.57	14.34	1.38.52	41. 4. 2 6.20	39.25	42015.58 211.19	15.46	1.31.20
37.28. 9 6. 1	36.30	49703.22 228.15	14.36	1.38.38	41.10.22 6.21	39.30	41804.39 210.75	15.48	1.31. 8
37.34.10 6. 2	36.35	49475.17 227.53	14.38	1.38.25	41.16.43 6.22	39.35	41593.64 210.31	15.50	1.30.57
37.40.12 6. 2	36.40	49247.64 227.01	14.40	1.38.11	41.23. 5 6.22	39.40	41383.33 209.86	15.52	1.30.46
37.46.14 6. 3	36.45	49020.63 226.51	14.42	1.37.58	41.29.27 6.23	39.45	41173.47 209.42	15.54	1.30.34
37.52.17 6. 3	36.50	48794.12 225.99	14.44	1.37.44	41.35.50 6.23	39.50	40964.05 208.99	15.56	1.30.23
37.58.20 6. 4	36.55	48568.13 225.47	14.46	1.37.31	41.42.13 6.24	39.55	40755.06 208.55	15.58	1.30.12
38. 4.24 6. 4	37. 0	48342.66 224.97	14.48	1.37.18	41.48.37 6.25	40. 0	40546.51 208.12	16. 0	1.30. 0
38.10.28 6. 5	37. 5	48117.69 224.47	14.50	1.37. 5	41.55. 2 6.25	40. 5	40338.39 207.69	16. 2	1.29.49
38.16.33 6. 5	37.10	47893.22 223.96	14.52	1.36.52	42. 1.27 6.26	40.10	40130.70 207.25	16. 4	1.29.38
38.22.38 6. 6	37.15	47669.26 223.46	14.54	1.36.39	42. 7.53 6.27	40.15	39923.45 206.82	16. 6	1.29.26
38.28.44 6. 6	37.20	47445.80 222.97	14.56	1.36.26	42.14.20 6.27	40.20	39716.63 206.40	16. 8	1.29.15
38.34.50 6. 7	37.25	47222.83 222.47	14.58	1.36.13	42.20.47 6.28	40.25	39510.23 205.97	16.10	1.29. 4
38.40.57 6. 7	37.30	47000.36 221.98	15. 0	1.36. 0	42.27.15 6.29	40.30	39304.26 205.55	16.12	1.28.53
38.47. 4 6. 8	37.35	46778.38 221.48	15. 2	1.35.47	42.33.44 6.29	40.35	39098.71 205.13	16.14	1.28.42
38.53.12 6. 8	37.40	46556.90 221.00	15. 4	1.35.35	42.40.13 6.30	40.40	38893.58 204.71	16.16	1.28.31
38.59.20 6. 9	37.45	46335.90 220.51	15. 6	1.35.22	42.46.43 6.31	40.45	38688.87 204.29	16.18	1.28.21
39. 5.29 6. 9	37.50	46115.39 220.02	15. 8	1.35.10	42.53.14 6.31	40.50	38484.58 203.87	16.20	1.28.10
39.11.38 6.10	37.55	45895.37 219.54	15.10	1.34.57	42.59.45 6.32	40.55	38280.71 203.46	16.22	1.27.59
39.17.48 6.10	38. 0	45675.83 219.06	15.12	1.34.44	43. 6.17 6.33	41. 0	38077.25 203.05	16.24	1.27.48
39.23.58 6.11	38. 5	45456.77 218.58	15.14	1.34.32	43.12.50 6.33	41. 5	37874.20 202.63	16.26	1.27.38
39.30. 9 6.12	38.10	45238.19 218.10	15.16	1.34.20	43.19.23 6.34	41.10	37671.57 202.22	16.28	1.27.27
39.36.21 6.12	38.15	45020.09 217.63	15.18	1.34. 7	43.25.57 6.35	41.15	37469.35 201.82	16.30	1.27.17
39.42.33 6.13	38.20	44802.46 217.15	15.20	1.33.55	43.32.32 6.36	41.20	37267.53 201.41	16.32	1.27. 6
39.48.46 6.13	38.25	44585.31 216.69	15.22	1.33.43	43.39. 8 6.36	41.25	37066.12 201.00	16.34	1.26.56
39.54.59 6.14	38.30	44368.62 216.22	15.24	1.33.31	43.45.44 6.37	41.30	36865.12 200.60	16.36	1.26.45
40. 1.13 6.14	38.35	44152.40 215.74	15.26	1.33.19	43.52.21 6.37	41.35	36664.52 200.20	16.38	1.26.35
40. 7.27 6.15	38.40	43936.66 215.29	15.28	1.33. 7	43.58.58 6.38	41.40	36464.32 199.80	16.40	1.26.24
40.13.42 6.15	38.45	43721.37 214.82	15.30	1.32.55	44. 5.36 6.39	41.45	36264.52 199.40	16.42	1.26.14
40.19.57 6.16	38.50	43506.55 214.36	15.32	1.32.43	44.12.15 6.41	41.50	36065.12 199.01	16.44	1.26. 3
40.26.13 6.17	38.55	43292.19 213.90	15.34	1.32.31	44.18.56 6.41	41.55	35866.11 198.62	16.46	1.25.53
40.32.30	39. 0	43078.29	15.36	1.32.18	44.25.37	42. 0	35667.49	16.48	1.25.43

MORVM LOGISTICORVM.

Arcus Qua- drantis. <i>Cum diffe- rentiis.</i>	Sexa- gesima scrupu- la.	Logarithmi <i>Cum diffe- rentiis.</i>	Qua- drivice na part et scru- rum.	Partes et Sexagesi- privativo rum.	Arcus Qua- drantis. <i>Cum diffe- rentiis.</i>	Sexa- gesima scrupu- la.	Logarithmi <i>Cum diffe- rentiis.</i>	Qua- drivice na part et scru- rum.	Partes et Sexagesi- privativo rum.
P. ' "	' "		P. ' "	P. ' "	P. ' "	' "		P. ' "	P. ' "
44.25.37 6.42	42. 0	35667.49 198.22	16.48	1.25.43	48.35.26 7.14	45. 0	28768.21 185.01	18. 0	1.20. 0
44.32.19 6.43	42. 5	35469.27 197.82	16.50	1.25.33	48.42.40 7.15	45. 5	28583.20 184.67	18. 2	1.19.51
44.39. 2 6.43	42.10	35271.45 197.43	16.52	1.25.22	48.49.55 7.16	45.10	28398.53 184.33	18. 4	1.19.42
44.45.45 6.44	42.15	35074.02 197.05	16.54	1.25.12	48.57.11 7.18	45.15	28214.20 184.00	18. 6	1.19.34
44.52.29 6.45	42.20	34876.97 196.66	16.56	1.25. 2	49. 4.29 7.18	45.20	28030.20 183.66	18. 8	1.19.25
44.59.14 6.46	42.25	34680.31 196.27	16.58	1.24.52	49.11.47 7.19	45.25	27846.54 183.32	18.10	1.19.16
45. 6. 0 6.47	42.30	34484.04 195.88	17. 0	1.24.42	49.19. 6 7.21	45.30	27663.22 182.98	18.12	1.19. 7
45.12.47 6.47	42.35	34288.16 195.50	17. 2	1.24.32	49.26.27 7.21	45.35	27480.24 182.65	18.14	1.18.59
45.19.34 6.48	42.40	34092.66 195.12	17. 4	1.24.22	49.33.48 7.23	45.40	27297.59 182.31	18.16	1.18.50
45.26.22 6.49	42.45	33897.54 194.74	17. 6	1.24.13	49.41.11 7.23	45.45	27115.28 181.98	18.18	1.18.41
45.33.11 6.50	42.50	33702.80 194.36	17. 8	1.24. 3	49.48.34 7.25	45.50	26933.30 181.65	18.20	1.18.32
45.40. 1 6.50	42.55	33508.44 193.99	17.10	1.23.53	49.55.59 7.25	45.55	26751.65 181.33	18.22	1.18.24
45.46.51 6.51	43. 0	33314.45 193.62	17.12	1.23.44	50. 3.24 7.27	46. 0	26570.32 181.00	18.24	1.18.16
45.53.42 6.52	43. 5	33120.83 193.24	17.14	1.23.34	50.10.51 7.27	46. 5	26389.32 180.67	18.26	1.18. 7
46. 0.34 6.53	43.10	32927.59 192.86	17.16	1.23.24	50.18.18 7.29	46.10	26208.65 180.34	18.28	1.17.59
46. 7.27 6.54	43.15	32734.73 192.50	17.18	1.23.14	50.25.47 7.30	46.15	26028.31 180.02	18.30	1.17.50
46.14.21 6.54	43.20	32542.23 192.11	17.20	1.23. 5	50.33.17 7.31	46.20	25848.29 179.70	18.32	1.17.42
46.21.15 6.55	43.25	32350.12 191.75	17.22	1.22.55	50.40.48 7.31	46.25	25668.59 179.37	18.34	1.17.34
46.28.10 6.56	43.30	32158.37 191.39	17.24	1.22.45	50.48.19 7.33	46.30	25489.22 179.05	18.36	1.17.25
46.35. 6 6.57	43.35	31966.98 191.02	17.26	1.22.36	50.55.52 7.34	46.35	25310.17 178.73	18.38	1.17.17
46.42. 3 6.58	43.40	31775.96 190.66	17.28	1.22.27	51. 3.26 7.36	46.40	25131.44 178.41	18.40	1.17. 9
46.49. 1 6.58	43.45	31585.30 190.30	17.30	1.22.17	51.11. 2 7.37	46.45	24953.03 178.09	18.42	1.17. 1
46.55.59 7. 0	43.50	31395.00 189.93	17.32	1.22. 8	51.18.39 7.39	46.50	24774.94 177.78	18.44	1.16.52
47. 2.59 7. 1	43.55	31205.07 189.57	17.34	1.21.58	51.26.18 7.40	46.55	24597.16 177.46	18.46	1.16.44
47.10. 0 7. 2	44. 0	31015.50 189.21	17.36	1.21.49	51.33.58 7.42	47. 0	24419.70 177.15	18.48	1.16.36
47.17. 2 7. 2	44. 5	30826.29 188.86	17.38	1.21.40	51.41.40 7.43	47. 5	24242.55 176.84	18.50	1.16.28
47.24. 4 7. 3	44.10	30637.43 188.50	17.40	1.21.31	51.49.23 7.44	47.10	24065.71 176.52	18.52	1.16.20
47.31. 7 7. 5	44.15	30448.93 188.15	17.42	1.21.22	51.57. 7 7.46	47.15	23889.19 176.21	18.54	1.16.11
47.38.12 7. 6	44.20	30260.78 187.80	17.44	1.21.13	52. 4.53 7.47	47.20	23712.98 175.90	18.56	1.16. 3
47.45.18 7. 7	44.25	30072.98 187.44	17.46	1.21. 3	52.12.40 7.49	47.25	23537.08 175.60	18.58	1.15.55
47.52.25 7. 7	44.30	29885.54 187.09	17.48	1.20.54	52.20.29 7.50	47.30	23361.48 175.29	19. 0	1.15.47
47.59.32 7. 9	44.35	29698.45 186.74	17.50	1.20.45	52.28.19 7.51	47.35	23186.19 174.98	19. 2	1.15.39
48. 6.41 7.10	44.40	29511.71 186.39	17.52	1.20.36	52.36.10 7.52	47.40	23011.21 174.67	19. 4	1.15.31
48.13.51 7.10	44.45	29325.32 186.04	17.54	1.20.27	52.44. 2 7.54	47.45	22836.54 174.37	19. 6	1.15.23
48.21. 1 7.12	44.50	29139.28 185.70	17.56	1.20.18	52.51.56 7.55	47.50	22662.17 174.06	19. 8	1.15.16
48.28.13 7.13	44.55	28953.58 185.36	17.58	1.20. 9	52.59.51 7.57	47.55	22488.11 173.75	19.10	1.15. 8
48.35.26	45. 0	28768.21	18. 0	1.20. 0	53. 7.48	48. 0	22314.36	19.12	1.15. 0

HEPTACOSIAS LOGARITH.

Arcus Qua- drantis. <i>Cum diffe- rentiis.</i>	Sexa- gesima scrupu- la.	Logarithmi <i>Cum diffe- rentiis.</i>	Qua- drivice nae part et scru.	Partes et Sexagesi- privativo- rum.	Arcus Qua- drantis. <i>Cum diffe- rentiis.</i>	Sexa- gesima scrupu- la.	Logarithmi <i>Cum diffe- rentiis.</i>	Qua- drivice nae part et scru.	Partes et Sexagesi- privativo- rum.
P. ' "	' "		P. ' "	P. ' "	P. ' "	' "		P. ' "	P. ' "
53. 7.48	48. 0	22314.36	19.12	1.15. 0	58.12.41	51. 0	16251.90	20.24	1.10.36
7.58		173.46			9. 5		163.27		
53.15.46	48. 5	22140.90	19.14	1.14.52	58.21.46	51. 5	16088.63	20.26	1.10.29
8. 0		173.16			9. 7		163.00		
53.23.46	48.16	21967.74	19.16	1.14.45	58.30.53	51.10	15925.63	20.28	1.10.22
8. 1		172.86			9.10		162.73		
53.31.47	48.15	21794.88	19.18	1.14.37	58.40. 3	51.15	15762.90	20.30	1.10.15
8. 3		172.56			9.12		162.47		
53.39.50	48.20	21622.32	19.20	1.14.29	58.49.15	51.20	15600.43	20.32	1.10. 8
8. 4		172.27			9.14		162.21		
53.47.54	48.25	21450.05	19.22	1.14.22	58.58.29	51.25	15438.22	20.34	1.10. 2
8. 6		171.97			9.17		161.95		
53.56. 0	48.30	21278.08	19.24	1.14.14	59. 7.46	51.30	15276.27	20.36	1. 9.55
8. 8		171.68			9.19		161.68		
54. 4. 8	48.35	21106.40	19.26	1.14. 7	59.17. 5	51.35	15114.59	20.38	1. 9.48
8.10		171.38			9.22		161.42		
54.12.18	48.40	20935.02	19.28	1.13.59	59.26.27	51.40	14953.17	20.40	1. 9.41
8.11		171.09			9.25		161.16		
54.20.29	48.45	20763.93	19.30	1.13.51	59.35.52	51.45	14792.01	20.42	1. 9.34
8.13		170.80			9.27		160.90		
54.28.42	48.50	20593.13	19.32	1.13.44	59.45.19	51.50	14631.11	20.44	1. 9.28
8.14		170.51			9.30		160.64		
54.36.56	48.55	20422.62	19.34	1.13.36	59.54.49	51.55	14470.47	20.46	1. 9.21
8.16		170.21			9.33		160.38		
54.45.12	49. 0	20252.41	19.36	1.13.28	60. 4.22	52. 0	14310.09	20.48	1. 9.14
8.17		169.92			9.36		160.13		
54.53.29	49. 5	20082.49	19.38	1.13.21	60.13.58	52. 5	14149.96	20.50	1. 9. 8
8.19		169.64			9.39		159.87		
55. 1.48	49.10	19912.85	19.40	1.13.13	60.23.37	52.10	13990.09	20.52	1. 9. 1
8.21		169.35			9.42		159.62		
55.10. 9	49.15	19743.50	19.42	1.13. 6	60.33.19	52.15	13830.47	20.54	1. 8.54
8.22		169.06			9.45		159.36		
55.18.31	49.20	19574.44	19.44	1.12.58	60.43. 4	52.20	13671.11	20.56	1. 8.48
8.24		168.77			9.48		159.11		
55.26.55	49.25	19405.67	19.46	1.12.51	60.52.52	52.25	13512.00	20.58	1. 8.42
8.26		168.49			9.51		158.87		
55.35.21	49.30	19237.18	19.48	1.12.44	61. 2.43	52.30	13353.13	21. 0	1. 8.35
8.28		168.21			9.54		158.61		
55.43.49	49.35	19068.97	19.50	1.12.36	61.12.37	52.35	13194.52	21. 2	1. 8.29
8.30		167.93			9.57		158.35		
55.52.19	49.40	18901.04	19.52	1.12.29	61.22.34	52.40	13036.17	21. 4	1. 8.22
8.32		167.64			10. 0		158.10		
56. 0.51	49.45	18733.40	19.54	1.12.22	61.32.34	52.45	12878.07	21. 6	1. 8.16
8.33		167.36			10. 3		157.85		
56. 9.24	49.50	18566.04	19.56	1.12.15	61.42.37	52.50	12720.22	21. 8	1. 8. 9
8.35		167.09			10. 7		157.60		
56.17.59	49.55	18398.95	19.58	1.12. 8	61.52.44	52.55	12562.62	21.10	1. 8. 3
8.37		166.81			10.10		157.35		
56.26.36	50. 0	18232.14	20. 0	1.12. 0	62. 2.54	53. 0	12405.26	21.12	1. 7.56
8.39		166.53			10.13		157.11		
56.35.15	50. 5	18065.61	20. 2	1.11.53	62.13. 7	53. 5	12248.15	21.14	1. 7.50
8.41		166.25			10.17		156.86		
56.43.56	50.10	17899.36	20. 4	1.11.46	62.23.24	53.10	12091.29	21.16	1. 7.43
8.43		165.97			10.20		156.62		
56.52.39	50.15	17733.39	20. 6	1.11.38	62.33.44	53.15	11934.67	21.18	1. 7.36
8.45		165.70			10.24		156.37		
57. 1.24	50.20	17567.69	20. 8	1.11.31	62. 4. 8	53.20	11778.30	21.20	1. 7.30
8.47		165.43			10.28		156.13		
57.10.11	50.25	17402.26	20.10	1.11.24	62.54.36	53.25	11622.17	21.22	1. 7.24
8.49		165.15			10.31		155.89		
57.19. 0	50.30	17237.11	20.12	1.11.17	63. 5. 7	53.30	11466.28	21.24	1. 7.18
8.51		164.88			10.35		155.64		
57.27.51	50.35	17072.23	20.14	1.11.10	63.15.42	53.35	11310.64	21.26	1. 7.12
8.54		164.61			10.39		155.40		
57.36.45	50.40	16907.62	20.16	1.11. 3	63.26.21	53.40	11155.24	21.28	1. 7. 6
8.56		164.34			10.43		155.16		
57.45.41	50.45	16744.28	20.18	1.10.56	63.37. 4	53.45	11000.08	21.30	1. 6.59
8.58		164.06			10.46		154.92		
57.54.39	50.50	16579.22	20.20	1.10.49	63.47.50	53.50	10845.16	21.32	1. 6.53
9. 0		163.79			10.50		154.68		
58. 3.39	50.55	16415.43	20.22	1.10.43	63.58.40	53.55	10690.48	21.34	1. 6.47
9. 2		163.53			10.54		154.43		
58.12.41	51. 0	16251.90	20.24	1.10.36	64. 9.34	54. 0	10536.05	21.36	1. 6.40

MORVM LOGISTICORVM

Arcus Qua- drantis. <i>Cum diffe- rentiis.</i>	Sexa- gesima scrupu- la.	Logarithmi <i>Cum diffe- rentiis.</i>	Qua- drivice nae part et scrup.	Partes et Sexagesi- privativo rum.	Arcus Qua- drantis. <i>Cum diffe- rentiis.</i>	Sexa- gesima scrupu- la.	Logarithmi <i>Cum diffe- rentiis.</i>	Qua- drivice nae part et scrup.	Partes et Sexagesi- privativo rum.
P. ' "	' "		P. ' "	P. ' "	P. ' "	' "		P. ' "	P. ' "
64. 9.34	54. 0	10536.05	21.36	I. 6.40	71.48.18	57. 0	5129.32	22.48	I. 3. 9
10.59		154.20			15.24		146.09		
64.20.33	54. 5	10381.85	21.38	I. 6.34	72. 3.42	57. 5	4983.23	22.50	I. 3. 4
11. 4		153.96			15.37		145.88		
64.31.37	54.10	10227.89	21.40	I. 6.28	72.19.19	57.10	4837.35	22.52	I. 2.58
11.08		153.73			15.50		145.67		
64.42.45	54.15	10074.16	21.42	I. 6.22	72.35. 9	57.15	4691.68	22.54	I. 2.53
11.13		153.49			16. 4		145.46		
64.53.58	54.20	9920.67	21.44	I. 6.16	72.51.13	57.20	4546.22	22.56	I. 2.47
11.17		153.26			16.19		145.25		
65. 5.15	54.25	9767.41	21.46	I. 6.10	73. 7.32	57.25	4400.97	22.58	I. 2.42
11.22		153.02			16.37		145.04		
65.16.37	54.30	9614.39	21.48	I. 6. 4	73.24. 9	57.30	4255.93	23. 0	I. 2.36
11.27		152.79			16.50		144.82		
65.28. 4	54.35	9461.60	21.50	I. 5.58	73.40.59	57.35	4111.11	23. 2	I. 2.30
11.32		152.56			17.10		144.61		
65.39.36	54.40	9309.04	21.52	I. 5.52	73.58. 9	57.40	3966.50	23. 4	I. 2.25
11.37		152.32			17.25		144.40		
65.51.13	54.45	9156.72	21.54	I. 5.46	74.15.34	57.45	3822.10	23. 6	I. 2.19
11.43		152.09			17.46		144.19		
66. 2.56	54.50	9004.63	21.56	I. 5.40	74.33.20	57.50	3677.91	23. 8	I. 2.14
11.48		151.86			17.58		143.99		
66.14.44	54.55	8852.77	21.58	I. 5.34	74.51.18	57.55	3533.92	23.10	I. 2. 9
11.54		151.63			18.35		143.78		
66.26.38	55. 0	8701.14	22. 0	I. 5.28	75. 9.53	58. 0	3390.14	23.12	I. 2. 4
12. 0		151.40			18.51		143.58		
66.38.30	55. 5	8549.74	22. 2	I. 5.22	75.28.44	58. 5	3246.56	23.14	I. 1.59
12. 6		151.17			19.15		143.37		
66.50.44	55.10	8398.57	22. 4	I. 5.16	75.47.59	58.10	3103.19	23.16	I. 1.53
12.12		150.94			19.41		143.16		
67. 2.56	55.15	8247.63	22. 6	I. 5.10	76. 7.40	58.15	2960.03	23.18	I. 1.48
12.18		150.72			20.10		142.96		
67.15.14	55.20	8096.91	22. 8	I. 5. 4	76.27.50	58.20	2817.07	23.20	I. 1.43
12.24		150.49			20.40		142.75		
67.27.38	55.25	7946.42	22.10	I. 4.58	76.48.30	58.25	2674.32	23.22	I. 1.38
12.30		150.27			21.13		142.54		
67.40. 8	55.30	7796.15	22.12	I. 4.52	77. 9.43	58.30	2531.78	23.24	I. 1.32
12.36		150.04			21.46		142.35		
67.52.44	55.35	7646.11	22.14	I. 4.47	77.31.29	58.35	2389.43	23.26	I. 1.27
12.44		149.81			22.26		142.15		
68. 5.28	55.40	7496.30	22.16	I. 4.41	77.53.55	58.40	2247.28	23.28	I. 1.22
12.51		149.59			23. 8		141.95		
68.18.19	55.45	7346.71	22.18	I. 4.35	78.17. 3	58.45	2105.33	23.30	I. 1.17
12.59		149.36			23.55		141.75		
68.31.18	55.50	7197.35	22.20	I. 4.29	78.40.58	58.50	1963.58	23.32	I. 1.12
13. 6		149.14			24.46		141.54		
68.44.24	55.55	7048.21	22.22	I. 4.23	79. 5.44	58.55	1822.04	23.34	I. 1. 6
13.14		148.92			25.45		141.34		
68.57.38	56. 0	6899.29	22.24	I. 4.17	79.31.29	59. 0	1680.70	23.36	I. 1. 1
13.22		148.70			26.50		141.14		
69.11. 0	56. 5	6750.59	22.26	I. 4.12	79.58.19	59. 5	1539.56	23.38	I. 0.56
13.30		148.48			28. 4		140.94		
69.24.30	56.10	6602.11	22.28	I. 4. 6	80.26.23	59.10	1398.62	23.40	I. 0.51
13.39		148.26			29.30		140.75		
69.38. 9	56.15	6453.85	22.30	I. 4. 0	80.55.53	59.15	1257.87	23.42	I. 0.46
13.48		148.04			31.10		140.55		
69.51.57	56.20	6305.81	22.32	I. 3.54	81.27. 3	59.20	1117.32	23.44	I. 0.40
13.57		147.82			33.11		140.35		
70. 5.54	56.25	6157.99	22.34	I. 3.49	82. 0.14	59.25	976.97	23.46	I. 0.35
14. 6		147.60			35.39		140.15		
70.20. 0	56.30	6010.39	22.36	I. 3.43	82.35.53	59.30	836.82	23.48	I. 0.30
14.16		147.38			38.44		139.96		
70.34.16	56.35	5863.01	22.38	I. 3.37	83.14.37	59.35	696.86	23.50	I. 0.25
14.27		147.17			42.52		139.76		
70.48.43	56.40	5715.84	22.40	I. 3.32	83.57.29	59.40	557.10	23.52	I. 0.20
14.37		146.95			48.37		139.57		
71. 3.20	56.45	5568.89	22.42	I. 3.26	84.46. 6	59.45	417.53	23.54	I. 0.15
14.48		146.74			57.37		139.37		
71.18. 8	56.50	5422.15	22.44	I. 3.20	85.43.43	59.50	278.16	23.56	I. 0.10
14.59		146.52			75. 5		139.18		
71.33. 7	56.55	5275.63	22.46	I. 3.15	86.58.48	59.55	138.98	23.58	I. 0. 5
15.11		146.31			181.12		138.98		
71.48.18	57. 0	5129.32	22.48	I. 3. 9	90. 0. 0	60. 0	0	24. 0	I. 0. 0

CANON Logarithmorum et Antilogarithmo-

Antilog.
Log.

Parts	270		271		272		93		94		95		96		Anti Log
	0	1	2	3	4	5	6	7	8	9	0	1	2	3	
Pro 10 ^o Decre.	Pro 10 ^o Decre.	Pro 10 ^o Decre.	Pro 10 ^o Decre.	Pro 10 ^o Decre.	Pro 10 ^o Decre.	Pro 10 ^o Decre.	Pro 10 ^o Decre.	Pro 10 ^o Decre.	Pro 10 ^o Decre.	Pro 10 ^o Decre.	Pro 10 ^o Decre.	Pro 10 ^o Decre.	Pro 10 ^o Decre.	Pro 10 ^o Decre.	Pro 10 ^o Decre.
0	Infinitum.	404828	275	335528	139	295007	92	266274	69	244006	56	225830	60		
1	814257	3175	271	4699	137	4454	92	265859	69	243674	55	225544	59		
2	744242	401549	267	3876	136	3903	91	265446	69	243343	55	225278	58		
3	704396	399949	263	3060	135	3356	91	265034	69	243013	55	225003	57		
4	675027	8374	259	2251	134	2811	90	264624	68	242684	55	224729	56		
5	653313	6824	255	1448	133	2270	90	264216	68	242357	55	224456	55		
6	635081	5298	251	330651	132	1731	89	263809	68	242031	54	224183	54		
7	619666	3794	247	529861	131	1195	89	263404	68	241705	54	223911	53		
8	606313	2313	243	9077	130	290663	88	263001	67	241380	54	223640	52		
9	594535	390853	240	8299	129	290133	88	262599	67	241057	54	223369	51		
10	583999	389414	236	7527	128	289606	87	262199	67	240735	54	223100	50		
11	574468	7996	233	6761	127	9081	87	261801	67	240414	53	222831	49		
12	565766	6598	230	6001	126	8559	87	261404	66	240094	53	222563	48		
13	557762	5219	227	5247	125	8040	86	261008	66	239775	53	222295	47		
14	550351	3858	224	4498	124	7524	86	260614	66	239457	53	222029	46		
15	543452	2516	221	3755	123	7011	85	260222	65	239140	53	221763	45		
16	536998	381192	218	3018	122	6500	85	259832	65	238824	53	221498	44		
17	530936	379885	215	2285	121	5991	84	259443	65	238509	52	221233	43		
18	525220	8595	212	1559	120	5485	84	259055	65	238195	52	220969	42		
19	519814	7321	210	320837	120	4982	83	258669	64	237881	52	220706	41		
20	514684	6063	207	320120	119	4482	83	258284	64	237569	52	220444	40		
21	509802	4821	204	319409	118	3984	83	257901	64	237258	52	220183	39		
22	5153	3595	202	8703	117	3488	82	257519	64	236948	52	219921	38		
23	500708	2383	200	8001	116	282995	82	257139	63	236639	51	219660	37		
24	496452	1185	197	7305	116	504	82	256760	63	236331	51	219401	36		
25	492370	370002	195	6613	115	282015	81	256383	63	236024	51	219142	35		
26	488448	368833	193	5926	114	1529	81	256007	63	235718	51	218884	34		
27	4674	7677	191	5244	113	1045	80	255633	63	235413	51	218626	33		
28	481038	6534	188	4567	112	280564	80	255260	62	235108	51	218369	32		
29	477529	5404	186	3894	112	280085	80	254888	62	234804	50	218112	31		
30	474139	4287	184	3225	111	279608	79	254518	62	234501	50	217857	30		
31	470860	3183	182	2561	110	9134	79	254149	62	234200	50	217602	29		
32	467685	2090	180	1902	109	8602	78	253781	61	233899	50	217348	28		
33	4608	361009	178	1246	109	8192	78	253415	61	233599	50	217094	27		
34	461623	359940	176	310595	108	7724	78	253050	61	233300	50	216841	26		
35	458724	8882	175	309948	107	7258	77	252686	61	233002	50	216589	25		
36	5907	7835	173	9306	106	6795	77	252324	60	232705	49	216337	24		
37	3167	6799	171	8667	106	6334	76	251963	60	232409	49	216086	23		
38	450500	5774	169	8033	105	5875	76	251604	60	232114	49	215835	22		
39	447903	4759	168	7402	104	5418	76	251246	60	231820	49	215585	21		
40	9371	3754	166	6776	104	274963	75	250889	60	231526	49	215336	20		
41	2902	2759	164	6153	103	510	75	250533	59	231233	49	215088	19		
42	440493	1774	162	5534	102	274059	75	250178	59	230941	48	214840	18		
43	438140	350800	161	4919	102	3610	74	249825	59	230650	48	214593	17		
44	5841	349833	159	4308	101	3163	74	249473	59	230360	48	214346	16		
45	3594	8877	158	3701	101	2718	74	249122	59	230071	48	214100	15		
46	431396	7929	156	3097	100	2276	73	248773	58	229783	48	213854	14		
47	429245	6990	155	2497	99	1835	73	248425	58	229495	48	213609	13		
48	7140	6060	153	1900	99	1396	73	248078	58	229208	48	213365	12		
49	5078	5139	152	1307	98	270959	73	247732	58	228922	47	213122	11		
50	3058	4226	151	300718	97	524	72	247387	58	228637	47	212879	10		
51	421078	3321	149	300132	97	270091	72	247044	57	228353	47	212636	9		
52	419136	2425	148	299549	96	269660	72	246702	57	228069	47	212394	8		
53	7232	1536	147	8970	95	9230	71	246361	57	227786	47	212153	7		
54	5363	340655	146	8394	95	8802	71	246021	57	227504	47	211912	6		
55	3528	339782	144	7822	94	8376	71	245682	57	227223	47	211672	5		
56	411726	8917	143	7252	94	267952	71	245344	56	226943	47	211433	4		
57	409956	8059	142	6686	93	530	70	245008	56	226664	46	211194	3		
58	8217	7208	141	6123	93	267110	70	244673	56	226385	46	210955	2		
59	6508	6365	140	5564	93	6691	70	244339	56	226107	46	210717	1		
60	404828	335528		295007	93	266274	70	244006		225830		210480	0		
Log	Pro 10 ^o Incr.	Incr.	Incr.	Incr.	Incr.	Incr.	Incr.	Incr.	Incr.	Incr.	Incr.	Incr.	Incr.	Incr.	Incr.
Anti	89	88	87	86	85	84	83	82	81	80	79	78	77	76	75

Log
Anti

rum ad singula Semicirculi Serupula.

Partes	277	278	99	100	101	102	103	104	105	106	Anti
	97	98	99	100	101	102	103	104	105	106	
	7	8	9	10	11	12	13	14	15	16	Log
	Decr. 39	Decr. 34	Decr. 31	Decr. 28	Decr. 25	Decr. 23	Decr. 21	Decr. 19	Decr. 18	Decr. 17	
0	210480	197294	185512	175072	165648	157064	149187	141914	135163	128867	60
1	244	196997	328	174907	499	156927	149061	797	135054	765	59
2	210008	791	185145	743	349	791	148935	681	134946	664	58
3	209772	585	184962	579	200	654	810	565	837	563	57
4	537	379	780	415	165051	518	684	448	729	462	56
5	303	196174	598	251	164903	382	559	332	621	361	55
6	209069	195969	416	174087	754	246	434	216	513	260	54
7	208836	765	234	173924	606	156111	309	141101	406	159	53
8	603	561	184053	761	458	155975	184	140985	298	128059	52
9	371	358	183872	599	311	840	148060	870	191	127958	51
10	208139	195155	692	436	163	705	147935	754	134083	858	50
11	207908	194953	512	274	164016	570	811	639	133976	758	49
12	678	751	332	173113	163869	436	687	524	869	657	48
13	448	549	183153	172951	722	301	563	409	762	557	47
14	207219	348	182974	790	576	167	439	295	655	457	46
15	206990	194147	795	629	429	155033	316	180	548	358	45
16	761	193947	617	468	283	154899	192	140066	441	258	44
17	533	747	439	308	163137	705	147069	139951	335	158	43
18	306	547	261	172147	162991	632	146946	837	229	127059	42
19	206079	348	182083	171987	846	499	823	723	122	126959	41
20	205853	193149	181906	828	701	366	700	609	133016	860	40
21	627	192951	729	668	556	233	577	495	132910	761	39
22	402	753	553	509	411	154100	455	382	804	662	38
23	205177	555	377	350	266	153967	333	268	698	563	37
24	204953	358	201	192	162122	835	210	155	593	464	36
25	729	192161	181025	171033	161978	703	146088	139042	487	365	35
26	506	191965	180850	170875	834	571	145966	138928	382	266	34
27	283	769	675	717	690	439	845	815	277	168	33
28	204061	573	500	560	547	307	723	703	171	126669	32
29	203839	378	326	402	403	176	602	590	132066	125971	31
30	618	191183	180152	245	260	153044	481	477	131961	873	30
31	397	190989	179978	170089	161117	152913	360	365	856	774	29
32	203177	795	805	169932	160975	782	239	253	752	676	28
33	202957	601	632	776	832	651	145118	141	647	578	27
34	738	408	459	620	690	521	144997	138029	543	481	26
35	519	215	287	464	548	390	877	137917	438	383	25
36	301	190022	179115	308	406	260	756	805	334	285	24
37	202083	189830	178943	169153	265	130	636	693	230	188	23
38	201866	638	771	168998	160123	152000	516	582	126	125090	22
39	649	447	600	843	159982	151871	396	471	131022	124993	21
40	433	256	429	689	841	741	277	359	130918	896	20
41	217	189065	258	534	700	612	157	248	815	799	19
42	201002	188875	178088	380	560	483	144038	137	711	702	18
43	200787	685	177918	326	419	354	143918	137027	608	605	17
44	572	495	748	168073	279	225	799	136916	504	508	16
45	358	306	579	167919	159139	151096	680	805	401	411	15
46	200145	188117	410	766	158999	150968	562	695	298	315	14
47	199932	187929	241	613	860	839	443	585	195	218	13
48	719	741	177072	461	721	711	324	474	130092	122	12
49	507	553	176904	308	581	583	206	364	129990	124025	11
50	295	366	736	156	442	456	143088	254	887	123929	10
51	199084	187179	569	167004	304	328	142970	145	784	833	9
52	198873	186992	401	166853	165	201	852	136035	682	737	8
53	663	806	234	701	158027	150073	734	135926	580	641	7
54	453	620	176067	550	157889	149946	617	816	478	545	6
55	244	434	175901	399	751	819	499	707	376	450	5
56	198035	249	735	249	613	692	382	598	274	354	4
57	197826	186064	569	166098	476	566	265	489	172	259	3
58	618	185880	403	165948	338	439	148	380	129070	163	2
59	411	696	237	798	201	313	142031	271	128968	123068	1
60	197204	185512	175072	165648	157064	149187	141914	135163	128867	122973	0
Log	Incr. 34	Incr. 31	Incr. 28	Incr. 25	Incr. 23	Incr. 21	Incr. 19	Incr. 18	Incr. 17	Incr. 16	
	172	171	170	169	168	167	166	165	164	163	
Anti	82	81	80	79	78	77	76	75	74	73	Partes
	262	261	260	259	258	257	256	255	254	253	

CANON Logarithmorum et Antilogarithmo-

Antilog:
Logarith

Partes	107	108	109	110	111	112	113	114	115	116	Anti Log
	17 Decr. 16	18 Decr. 15	19 Decr. 14	20 Decr. 13	21 Decr. 13	22 Decr. 12	23 Decr. 11	24 Decr. 11	25 Decr. 10	26 Decr. 10	
0	122973	117436	112218	107288	102619	98188	93973	89959	86129	82469	60
1	878	346	134	209	544	116	905	894	86066	409	59
2	783	257	112049	129	468	98044	837	828	86004	350	58
3	688	168	111965	107049	392	97972	769	763	85942	290	57
4	593	117078	881	106969	317	900	700	698	879	231	56
5	498	116989	797	890	241	829	632	633	817	171	55
6	404	900	713	810	166	757	563	568	755	112	54
7	309	811	629	731	102091	685	495	503	693	82052	53
8	215	722	545	651	102015	614	427	438	631	81993	52
9	121	634	461	572	101940	542	359	373	569	934	51
10	122026	545	377	493	865	471	291	308	507	875	50
11	121932	456	294	414	790	399	223	243	445	815	49
12	838	368	210	335	715	328	155	179	383	756	48
13	744	279	127	256	640	257	93087	114	322	697	47
14	650	191	111043	177	565	186	93019	89049	260	638	46
15	557	103	110960	106098	490	115	92952	88985	198	579	45
16	463	116015	877	106019	415	97044	884	920	136	520	44
17	369	115927	794	105940	341	96973	816	856	85075	461	43
18	276	839	710	862	266	902	749	791	85013	402	42
19	183	751	627	783	191	831	681	727	84952	344	41
20	121089	663	544	704	117	760	614	662	890	285	40
21	120996	575	462	626	101042	689	546	598	829	226	39
22	903	487	379	548	100968	618	479	534	767	167	38
23	810	400	296	469	894	548	412	470	706	109	37
24	717	312	213	391	819	477	345	405	645	81050	36
25	625	225	131	313	745	406	277	341	584	80991	35
26	532	138	110048	235	671	336	210	277	522	933	34
27	439	115050	109966	157	597	266	143	213	461	874	33
28	347	114963	884	105079	523	195	92076	149	400	816	32
29	255	876	801	105001	449	125	92009	88085	339	758	31
30	162	789	719	104923	375	96055	91942	88022	278	699	30
31	120070	702	637	845	301	95984	875	87958	217	641	29
32	119978	616	555	767	228	914	809	894	156	583	28
33	886	529	473	690	154	844	742	830	84095	524	27
34	794	442	391	612	100080	774	675	767	84035	466	26
35	702	356	309	534	100007	704	608	703	83974	408	25
36	610	269	228	457	99933	634	542	640	913	350	24
37	519	183	146	380	860	564	475	576	852	292	23
38	427	96	109064	303	786	495	409	512	792	234	22
39	336	114010	108983	225	713	425	342	449	731	176	21
40	244	113924	902	148	640	355	276	386	671	118	20
41	153	838	820	104071	567	286	210	322	610	80060	19
42	119062	752	739	103994	494	216	143	259	550	80002	18
43	118971	666	658	917	421	147	91077	196	489	79944	17
44	880	580	577	840	348	95077	91011	133	429	887	16
45	789	495	496	764	275	95008	90945	87070	368	829	15
46	698	409	415	687	202	94938	879	87007	308	771	14
47	607	323	334	610	129	869	813	86944	248	713	13
48	517	238	253	534	99056	800	747	881	188	656	12
49	426	152	172	457	98983	731	681	818	128	598	11
50	336	113067	091	381	911	662	615	755	83067	541	10
51	245	112982	108011	304	838	593	549	692	83007	483	9
52	155	897	107930	228	766	524	483	629	82947	426	8
53	118065	812	850	151	693	455	417	567	887	368	7
54	117975	727	769	103075	621	386	352	504	827	311	6
55	885	642	689	102999	549	317	286	441	768	254	5
56	795	557	609	923	476	248	221	378	708	197	4
57	705	472	529	847	404	179	155	316	648	139	3
58	615	387	448	771	332	111	90090	253	588	79082	2
59	525	303	368	695	260	94042	90024	191	529	79025	1
60	117436	112218	107288	102619	98188	93973	89959	86129	82469	78968	0
Log	Incr. 15 162	Incr. 15 161	Incr. 14 160	Incr. 13 159	Incr. 13 158	Incr. 12 157	Incr. 11 156	Incr. 11 155	Incr. 10 154	Incr. 9 153	Partes
Anti	72	71	70	69	68	67	66	65	64	63	Partes

Log:
Anti

CANON Logarithmorum et Antilogarithmo-

Partes	309	310	131	132	133	134	135	136	137	138	139	140	Anti Log
	129	130	41	42	43	44	45	46	47	48	49	50	
	Decr. 6	Decr. 6	Decr. 6	Decr. 5	Decr. 5	Decr. 5	Decr. 5	Decr. 5	Decr. 4	Decr. 4	Decr. 4	Decr. 4	
0	46311	44194	42150	40178	38273	36433	34657	32942	31286	29686	28142	26651	60
1	46276	59	42117	45	42	36403	34628	32914	59	60	28117	27	59
2	40	44125	42083	40113	38210	36373	34599	32886	32	34	28092	26603	58
3	46204	44090	50	40081	38179	43	70	58	31204	29608	66	26578	57
4	46168	56	42016	48	48	36313	41	30	31177	29582	41	54	56
5	46132	44021	41983	40016	38117	36283	34512	32802	50	55	28016	30	55
6	46096	43986	50	39984	38086	53	34483	32774	31123	29	27991	26505	54
7	60	52	41917	52	55	36223	54	46	31096	29503	66	26481	53
8	46025	43917	41883	39920	38024	36193	34425	32718	69	29477	40	57	52
9	45989	43883	50	39888	37993	63	34396	32690	42	51	27915	32	51
10	53	48	41817	55	62	33	67	62	31015	29425	27890	26408	50
11	45918	43814	41783	39823	31	36103	38	34	30988	29399	65	26384	49
12	45882	43780	50	39791	37900	36073	34309	32606	61	73	40	60	48
13	46	45	41717	59	37869	43	34281	32578	34	47	27815	35	47
14	45811	43711	41684	39727	38	36013	52	50	30908	29321	27790	26311	46
15	45775	43676	51	39695	37807	35984	34223	32523	30881	29295	65	26287	45
16	39	42	41617	63	37776	54	34194	32495	54	69	39	63	44
17	45704	43608	41584	39631	45	35924	65	67	27	43	27714	39	43
18	45668	43573	51	39599	37714	35894	36	39	30800	29217	27689	26214	42
19	45633	39	41518	67	37683	64	34108	32411	30773	29191	64	26190	41
20	45597	43505	41485	35	52	34	34079	32384	47	66	39	66	40
21	62	43471	52	39503	37622	35805	50	56	30720	40	27614	42	39
22	45526	36	41419	39471	37591	35775	34021	28	30693	29114	27589	26118	38
23	45491	43402	41386	39	60	45	33993	32300	66	29088	65	26094	37
24	55	43368	53	39408	37529	35716	64	32273	39	62	40	70	36
25	45420	34	41320	39376	37499	35686	35	45	30613	36	27515	46	35
26	45385	43300	41287	44	68	56	33907	32217	30586	29011	27490	26022	34
27	49	43265	54	39312	37	35627	33878	32190	59	28985	65	25998	33
28	45314	43231	41221	39280	37406	35597	49	62	32	59	40	74	32
29	45279	43197	41188	49	37376	67	33821	34	30506	33	27415	50	31
30	43	63	55	39217	45	38	33792	32107	30479	28907	27390	26	30
31	45208	43129	41122	39185	37314	35508	64	32079	52	28882	65	25902	29
32	45173	43095	41090	53	37284	35478	35	52	30426	56	41	25878	28
33	38	61	57	39122	53	49	33707	32024	30399	30	27316	54	27
34	45102	43027	41024	39090	37223	35419	33678	31996	73	28805	27291	30	26
35	45067	42993	40991	58	37192	35390	50	69	46	28779	66	25806	25
36	45032	59	58	39027	61	60	33621	41	30319	53	41	25782	24
37	44997	42925	40926	38995	31	31	33593	31914	30293	28	27217	58	23
38	62	42891	40893	63	37100	35301	64	31886	66	28702	27192	34	22
39	44927	57	60	32	37070	35272	36	59	40	28676	67	25710	21
40	44891	42824	40827	38900	40	42	33507	31	30213	51	43	25687	20
41	56	42790	40795	38869	37009	35213	33479	31804	30187	25	27118	63	19
42	44821	56	62	37	36978	35184	50	31777	60	28600	27093	39	18
43	44786	42722	40729	38806	48	54	33422	49	34	28574	68	25615	17
44	51	42688	40697	38774	36918	35125	33394	31722	30107	49	44	25591	16
45	44716	55	64	43	36887	35096	65	31694	30081	28523	27019	68	15
46	44681	42621	40632	38711	57	66	37	67	55	28498	26995	44	14
47	46	42587	40599	38680	36827	37	33309	40	28	72	70	25520	13
48	44611	53	67	48	36796	35008	33280	31612	30002	47	45	25496	12
49	44577	42520	34	38617	66	34978	52	31585	29975	28421	26921	73	11
50	42	42486	40502	38586	36	36	33224	58	49	28396	26896	49	10
51	44507	52	40469	54	36705	34920	33196	31	29923	70	72	25	9
52	44472	42419	37	38523	36675	34891	67	31503	29896	45	47	25402	8
53	37	42385	40404	38492	45	61	39	31476	70	28320	26823	25378	7
54	44402	52	40372	60	36614	32	33111	49	44	28294	26798	54	6
55	44368	42318	39	38429	36584	34803	33083	31422	29818	69	74	31	5
56	44333	42284	40307	38398	54	34774	55	31394	29791	43	49	25307	4
57	44298	51	40275	66	36524	45	33026	67	65	28218	25	25283	3
58	63	42217	42	35	36494	34716	32998	40	39	28193	26700	60	2
59	44229	42184	40210	38304	64	34686	70	31313	29713	67	26676	36	1
60	44194	42150	40178	38273	36433	34657	32942	31286	29686	28142	26651	25213	0
	Incr. 6	Incr. 6	Incr. 5	Incr. 5	Incr. 5	Incr. 5	Incr. 5	Incr. 5	Incr. 4	Incr. 4	Incr. 4	Incr. 4	
Log	140	139	138	137	136	135	134	133	132	131	130	129	
Anti	50	49	48	47	46	45	44	43	42	41	40	39	

Sum ad singula Semicirculi Scrupula.

Log	721		722		141	142	143	144	145	146	147	148	149	150	151	152	Anti
	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	
	Decr. 4	Decr. 4	Decr. 4	Decr. 4	Decr. 3	Decr. 3	Decr. 3	Decr. 3	Decr. 3	Decr. 3	Decr. 3	Decr. 3	Decr. 3	Decr. 3	Decr. 3	Decr. 3	Log
0	25213	23824	22485	21193	19949	18749	17594	16482	15412	14384	13397	12449	60				
1	25189	23802	63	72	28	29	75	64	15395	67	80	33	59				
2	66	23779	41	51	19908	18710	56	45	77	50	64	18	58				
3	42	56	22419	30	19887	18690	37	27	66	34	48	12403	57				
4	25119	33	22397	21109	67	71	17518	16409	42	17	32	12387	56				
5	25095	23711	76	21088	47	51	17499	16391	25	14300	16	72	55				
6	72	23688	54	67	27	31	81	73	15307	14283	13300	56	54				
7	48	66	32	46	19806	18612	62	55	15290	67	13284	41	53				
8	25	43	22310	25	19786	18592	43	37	73	50	68	52	52				
9	25001	23620	22288	21004	66	73	24	19	55	33	52	12310	51				
10	24978	23598	66	20983	45	53	17405	16301	38	17	36	12295	50				
11	54	75	45	32	25	34	17387	16283	21	14200	20	79	49				
12	31	53	23	41	19705	18514	68	64	15203	14183	13204	64	48				
13	24908	30	22201	20920	19685	18495	49	46	15186	67	13188	49	47				
14	24884	23507	22179	20899	65	75	30	28	69	50	72	33	46				
15	61	23485	58	78	44	56	17312	16210	51	33	56	18	45				
16	38	62	36	57	24	37	17293	16192	34	17	40	12203	44				
17	24814	40	22114	36	19604	18417	74	74	15117	14100	24	12188	43				
18	24791	23417	22093	20815	19584	18398	56	56	15099	14084	13108	72	42				
19	68	23395	71	20794	64	78	37	39	82	67	13092	57	41				
20	44	72	49	73	44	59	18	21	65	50	76	42	40				
21	24721	50	28	53	24	46	17200	16103	48	34	60	26	39				
22	24698	28	22006	32	19503	20	17181	16085	30	17	44	12111	38				
23	75	23305	21984	20711	19483	18301	62	67	15013	14001	29	12096	37				
24	51	23283	63	20690	63	18282	44	49	14996	13984	13013	81	36				
25	28	60	41	69	43	62	25	31	79	68	12997	66	35				
26	24605	38	21920	48	23	43	17107	16013	62	51	81	50	34				
27	24582	23216	21898	28	19403	24	17088	15995	44	35	65	35	33				
28	59	23193	76	20607	19383	18204	69	77	27	18	49	20	32				
29	35	71	55	20586	63	18185	51	60	14910	13902	34	12005	31				
30	24512	49	33	65	43	66	32	42	14893	13885	18	11990	30				
31	24489	26	21812	45	23	47	17014	24	76	69	12902	75	29				
32	66	23104	21790	24	19303	27	16995	15906	59	52	12886	59	28				
33	43	23082	69	20503	19283	18108	77	15888	42	36	70	44	27				
34	24420	59	47	20482	63	18089	58	71	25	20	55	29	26				
35	24397	37	26	62	43	70	40	53	14807	13803	39	11914	25				
36	74	23015	31704	41	23	51	21	35	14790	13787	23	11899	24				
37	51	22993	21683	20	19203	31	16903	15817	73	70	12808	84	23				
38	28	71	62	20400	19184	18012	16884	15799	56	54	12792	69	22				
39	24305	48	40	20379	64	17993	66	82	39	38	76	54	21				
40	24282	26	21619	58	44	74	48	64	22	21	60	39	20				
41	59	22904	21597	38	24	55	29	40	14705	13705	45	24	19				
42	36	22882	76	20317	19104	36	16811	29	14688	13689	29	11809	18				
43	24213	60	55	20297	19084	17917	16792	15711	71	72	12713	11794	17				
44	24190	37	33	76	64	17897	74	15693	54	56	12698	79	16				
45	67	22815	21512	55	45	78	56	76	37	40	82	64	15				
46	44	22793	21491	35	25	59	37	58	20	23	66	49	14				
47	24121	71	69	20214	19005	40	19	40	14603	13607	51	34	13				
48	24098	49	48	20194	18985	21	16701	23	14586	13591	35	19	12				
49	75	27	27	73	65	17802	16682	15605	69	75	20	11704	11				
50	52	22705	21405	53	46	17783	64	15588	53	58	12604	11689	10				
51	29	22683	21384	32	26	64	46	70	36	42	12589	74	9				
52	24007	61	63	20112	18906	45	28	52	19	26	73	59	8				
53	23984	39	42	20091	18887	26	16609	35	14502	13510	57	44	7				
54	61	22617	21321	71	67	17707	16591	17	14485	13493	42	29	6				
55	38	22595	21299	50	47	17688	73	15500	68	77	26	15	5				
56	23915	73	78	30	28	69	55	15482	51	61	12511	11600	4				
57	23893	51	57	20010	18808	50	36	65	34	45	12495	11585	3				
58	70	29	36	19989	18788	31	18	47	18	29	80	70	2				
59	47	22567	21215	69	69	17613	16500	30	14401	13413	64	55	1				
60	23824	22485	21193	19949	18749	17594	16482	15412	14384	13397	12449	11540	0				
	Incr. 4	Incr. 4	Incr. 4	Incr. 3	Incr. 3	Incr. 3	Incr. 3	Incr. 3	Incr. 3	Incr. 3	Incr. 3	Incr. 3					
Log	128	127	126	125	124	123	122	121	120	119	118	117					
Anti	38	37	36	35	34	33	32	31	30	29	28	27					

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Log	333		334		155	156	157	158	159	160	161	162	163	164	165	Anti
	153	154	65	66	67	68	69	70	71	72	73	74	75			
	63	64	Decr. 2	Decr. 2	Decr. 2	Decr. 2	Decr. 2	Decr. 2	Decr. 2	Decr. 2	Decr. 2	Decr. 2	Decr. 2	Decr. 2	Decr. 2	Log
0	11540	10670	9838	9042	8283	7560	6873	6220	5602	5018	4468	3951	3467	60	60	
1	25	56	24	29	71	49	62	6210	5592	5009	59	42	59	59	59	
2	11511	42	9810	16	59	37	50	6199	82	4999	50	24	51	58	58	
3	11496	28	9797	9003	46	25	39	88	72	90	41	26	43	57	57	
4	81	10613	83	8990	34	13	28	78	62	80	32	18	36	56	56	
5	66	10599	70	78	22	7502	17	67	52	71	23	09	28	55	55	
6	52	85	56	65	8209	7490	6806	57	42	62	15	3901	20	54	54	
7	37	71	43	52	8197	78	6795	46	32	52	4406	3893	12	53	53	
8	22	57	29	39	85	67	84	36	22	43	4397	84	3405	52	52	
9	11407	43	16	26	73	55	73	25	12	33	88	76	3397	51	51	
10	11393	29	9702	13	60	43	62	15	5502	24	79	68	89	50	50	
11	78	15	9689	8900	48	32	51	6104	5493	15	71	60	82	49	49	
12	63	10501	76	8887	36	20	39	6094	83	4905	62	51	74	48	48	
13	49	10487	62	75	24	7408	28	83	73	4896	53	43	66	47	47	
14	34	73	49	62	8111	7397	17	73	63	87	44	35	59	46	46	
15	19	58	35	49	8099	85	6706	62	53	77	35	27	51	45	45	
16	11305	44	22	36	87	73	6695	52	43	68	27	19	43	44	44	
17	11290	30	9608	23	75	62	84	42	33	59	18	10	36	43	43	
18	75	16	9595	8811	63	50	73	31	23	50	4309	3802	28	42	42	
19	61	10402	82	8798	50	39	62	21	14	40	4301	3794	20	41	41	
20	46	10388	68	85	38	27	51	10	5404	31	4292	86	13	40	40	
21	31	74	55	72	26	16	40	6000	5794	22	83	78	3305	39	39	
22	17	60	42	60	14	7304	30	5990	84	12	74	70	3297	38	38	
23	11202	47	28	47	8002	7293	19	79	74	4803	66	61	90	37	37	
24	11188	33	15	34	7990	81	6608	69	64	4794	57	53	82	36	36	
25	73	19	9502	22	78	70	6597	58	55	85	48	45	75	35	35	
26	59	10305	9488	8709	66	58	86	48	45	76	40	37	67	34	34	
27	44	10291	75	8696	54	47	75	38	35	66	31	29	60	33	33	
28	29	77	62	84	41	35	64	27	25	57	22	21	52	32	32	
29	15	63	49	71	29	24	53	17	16	48	14	13	45	31	31	
30	11100	49	35	58	17	12	42	5907	5306	39	4205	3705	37	30	30	
31	11086	35	22	46	7905	7201	31	5897	5296	30	4197	3697	30	29	29	
32	71	21	9409	33	7893	7189	20	86	86	20	88	89	22	28	28	
33	57	10208	9396	20	81	78	6510	76	77	11	79	81	14	27	27	
34	42	10194	82	8608	69	66	6499	66	67	4702	71	73	3207	26	26	
35	28	80	69	8595	57	55	88	55	57	4693	62	64	3200	25	25	
36	11014	66	56	82	45	44	77	45	48	84	54	56	3192	24	24	
37	10999	52	43	70	33	32	66	35	38	75	45	48	85	23	23	
38	85	38	30	57	21	21	55	25	28	66	37	40	77	22	22	
39	70	25	16	45	7809	7109	45	15	19	57	28	32	70	21	21	
40	56	10111	9303	32	7797	7098	34	5804	5209	48	19	24	62	20	20	
41	42	10097	9290	20	85	87	23	5794	5199	38	11	17	55	19	19	
42	27	83	77	8507	73	75	12	84	90	29	4102	3609	47	18	18	
43	10913	70	64	8495	62	64	6402	74	80	20	4094	3601	40	17	17	
44	10898	56	51	82	50	53	6391	64	71	11	85	3593	33	16	16	
45	84	42	38	70	38	41	80	53	61	4602	77	85	25	15	15	
46	70	29	24	57	26	30	69	43	51	4593	68	77	18	14	14	
47	55	15	9211	45	14	19	59	33	42	84	60	69	10	13	13	
48	41	10001	9198	32	7702	7007	48	23	32	75	52	61	3103	12	12	
49	27	9987	85	20	7690	6996	37	13	23	66	43	53	3096	11	11	
50	10812	74	72	8407	78	85	27	5703	13	57	35	45	88	10	10	
51	10798	60	59	8395	66	74	16	5693	5104	48	26	37	81	9	9	
52	84	46	46	82	55	62	6305	83	5094	39	18	29	74	8	8	
53	70	33	33	70	43	51	6295	72	85	30	4009	22	66	7	7	
54	55	19	20	57	31	40	84	62	75	21	4001	14	59	6	6	
55	41	9906	9107	45	19	29	73	52	66	12	3993	3506	52	5	5	
56	27	9892	9094	33	7607	18	63	42	56	4503	84	3498	44	4	4	
57	10713	78	81	20	7596	6906	52	32	47	4495	76	90	37	3	3	
58	10699	65	68	8308	84	6895	41	22	37	86	68	82	30	2	2	
59	84	51	55	8296	72	84	31	12	28	77	59	75	23	1	1	
60	10670	9838	9042	8283	7560	6873	6220	5602	5018	4468	3951	3467	3015	0	0	
	Incr. 2	Incr. 2	Incr. 2	Incr. 2	Incr. 2	Incr. 2	Incr. 2	Incr. 2	Incr. 2	Incr. 2	Incr. 2	Incr. 2	Incr. 2	Incr. 2		
Log	116	115	114	113	112	111	110	109	108	107	106	105	104			
Anti	26	25	24	23	22	21	20	19	18	17	16	15	14			

aphæresibus ORBIS in quinque Planetis.

Angulus Co- nstructionis.	Proportio Laterum seu Intervallorum.										
	150000		170000		190000		210000		230000		
	140000	160000	180000	200000	220000	240000	Gr.Scr.	Gr.Scr.	Gr.Scr.	Gr.Scr.	Gr.Scr.
10	1.58	1.49	1.40	1.32	1.24	1.18	1.11	1.5	1.0	0.54	0.50
20	3.55	3.37	3.19	3.3	2.48	2.34	2.21	2.9	1.58	1.48	1.38
30	5.48	5.20	4.55	4.31	4.8	3.47	3.28	3.10	2.54	2.38	2.24
40	7.36	6.59	6.25	5.53	5.23	4.56	4.30	4.7	3.45	3.26	3.7
50	9.16	8.30	7.47	7.8	6.32	5.58	5.27	4.58	4.32	4.7	3.45
60	10.46	9.52	9.1	8.15	7.32	6.52	6.16	5.42	5.12	4.44	4.18
70	12.4	11.1	10.4	9.10	8.22	7.37	6.56	6.18	5.44	5.12	4.44
80	13.7	11.57	10.52	9.53	9.0	8.10	7.25	6.45	6.7	5.32	5.2
90	13.51	12.35	11.25	10.21	9.23	8.30	7.42	6.59	6.19	5.44	5.11
100	14.14	12.53	11.39	10.33	9.31	8.36	7.46	7.1	6.21	5.44	5.11
101	14.16	12.53	11.39	10.32	9.31	8.36	7.46	7.1	6.21	5.44	5.11
102	17	54	39	31	30	35	46	0	20	43	10
103	17	12.54	11.39	31	30	8.35	45	7.0	20	43	9
104	17	53	38	30	29	34	44	6.59	19	42	9
105	14.17	53	38	30	28	33	43	58	17	41	5.8
106	16	53	37	29	28	32	7.42	57	16	39	7
107	16	52	36	28	27	31	41	56	6.15	5.38	6
108	15	50	34	26	9.25	30	40	54	14	37	4
109	14	49	33	10.25	23	28	38	53	12	36	3
110	12	47	31	23	21	8.26	36	51	11	34	2
111	10	46	29	21	19	23	34	6.49	9	33	5.0
112	8	44	26	18	17	21	31	47	7	31	4.59
113	5	41	24	16	14	18	29	45	5	29	57
114	3	38	21	13	12	16	7.27	43	3	27	56
115	14.1	35	19	10	9	14	25	41	6.1	5.25	53
116	13.58	32	15	7	6	11	22	38	5.59	23	51
117	54	29	11	3	9.13	8	19	35	57	21	49
118	50	25	8	10.0	8.59	5	16	32	54	19	47
119	46	21	4	9.57	56	8.2	13	6.29	51	16	4.45
120	41	16	11.0	53	52	7.58	10	26	48	13	4.2
121	36	12	10.56	49	48	55	6	23	45	11	4.0
122	31	7	51	45	44	51	7.3	19	42	8	37
123	26	12.2	46	40	39	47	6.59	16	39	5	35
124	20	11.56	41	35	8.35	43	55	12	5.36	5.2	32
125	14	50	36	29	30	38	51	9	32	4.59	29
126	7	44	30	24	26	7.34	47	5	28	56	4.26
127	13.1	37	24	19	20	29	43	6.1	25	52	23
128	12.54	31	18	13	15	24	39	5.57	21	49	20
129	46	24	11	7	9	19	6.34	53	17	45	17
130	39	17	10.5	9.1	8.4	14	29	49	13	42	13
131	31	10	9.58	8.54	7.58	8	24	44	9	38	10
132	22	11.2	51	47	52	7.3	19	40	5	34	6
133	14	10.55	43	40	45	6.57	13	35	5.0	4.30	4.3
134	12.5	47	35	33	39	51	8	5.30	4.56	4.26	3.59
135	11.56	36	27	26	32	45	6.2	25	52	22	55
136	46	27	19	19	26	39	5.56	20	47	18	51
137	36	18	11	11	19	32	50	14	42	14	47
138	25	10.8	9.2	8.3	12	26	45	9	37	9	43
139	14	9.59	8.53	7.55	7.4	19	39	5.3	32	4	39
140	11.3	9.49	8.44	7.46	6.56	6.12	5.33	4.58	4.27	4.0	3.35
144	10.16	9.6	8.5	7.11	6.24	5.43	5.6	4.34	4.6	3.40	3.18
148	9.23	8.18	7.21	6.32	5.49	5.11	4.38	4.9	3.43	3.20	2.59
152	8.25	7.26	6.35	5.50	5.11	4.38	4.8	3.41	3.18	2.57	2.39
156	7.22	6.29	5.45	5.5	4.32	4.2	3.36	3.13	2.53	2.34	2.18
160	6.16	5.31	4.52	4.19	3.50	3.24	3.2	2.43	2.25	2.10	1.57
164	5.6	4.29	3.57	3.30	3.6	2.45	2.27	2.12	1.57	1.45	1.34
168	3.51	3.24	3.9	2.39	2.21	2.5	1.51	1.39	1.29	1.19	1.11
172	2.36	2.17	2.1	1.47	1.35	1.24	1.15	1.7	1.0	0.53	0.48
176	1.18	1.9	1.1	0.54	0.47	0.42	0.38	0.33	0.30	0.27	0.24
180	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Pars CANONIS Mesologarithmorum ad Gr. decem. Pro latitudinibus potissimum quinque Planetarum.

Decem. 1022	221	123	86	66	53	45	39	34	31	
Partes seu Gradus.										
228	0	1	2	3	4	5	6	7	8	9
0	Infinitum.	404813	335467	294870	266030	243625	225280	209732	196226	184273
1	814257	3159	4637	4315	5613	243290	225001	492	196015	184085
2	744942	401533	3813	3763	5198	242957	224723	253	195804	183897
3	704396	399932	2996	3214	4784	624	445	209014	595	709
4	675627	8357	2186	2668	4372	242293	224167	208775	385	523
5	653313	6806	1382	2125	263962	241963	223890	537	195176	336
6	635081	5280	330584	1585	553	634	615	299	194967	183149
7	619666	3775	329793	1047	263146	241306	340	208062	758	182963
8	606313	2293	9008	290513	262741	240979	223066	207826	551	777
9	594534	390833	8229	289982	2337	654	222792	590	343	592
10	583998	389393	7455	9453	261934	328	520	355	194136	407
11	574467	7975	6688	8927	534	240004	222248	207120	193930	222
12	565765	6576	5927	8404	261135	239682	221976	206886	723	182037
13	557762	5196	5172	7883	260737	360	705	652	517	181854
14	550350	3835	4422	7365	260342	239039	436	419	312	670
15	543451	2492	3678	6850	259947	238720	221167	206187	193107	486
16	536997	381168	2940	6337	555	401	220899	205955	192903	303
17	530935	379860	2206	5827	259163	238083	631	723	698	181120
18	525219	8569	1478	5320	8773	237767	363	492	494	180938
19	519812	7295	320755	4814	8385	450	220097	262	291	755
20	514682	6036	320037	4313	257998	237135	219832	205032	192088	573
21	509803	4793	319325	3813	613	236821	567	204802	191885	392
22	5151	3567	8618	3315	257228	509	302	573	683	211
23	500706	2354	7914	2821	256846	236197	219038	345	481	180029
24	496450	371155	7217	2328	465	235886	218776	204117	279	179849
25	492367	369971	6524	1837	256086	577	514	203889	191078	668
26	488445	8802	5836	1349	255707	235267	218252	662	190878	489
27	4671	7645	5253	280865	5331	234959	217991	435	678	309
28	481035	6501	4474	280381	254956	651	731	203210	478	179129
29	477525	5370	3800	279900	5827	345	471	202984	278	178950
30	4135	4253	3130	9421	254209	234040	217212	759	190079	771
31	470856	3148	2464	278946	253838	233736	216954	534	189880	592
32	467681	2054	1804	472	468	432	697	310	682	414
33	4603	360972	1147	278000	253099	233129	439	202087	484	236
34	461618	359903	310495	277530	252732	232827	216183	201864	286	178059
35	458719	8844	309846	7062	367	527	215927	641	189088	177882
36	5902	7796	9203	6597	252001	232227	672	419	188891	705
37	3161	6759	8563	6135	1638	231928	418	201197	695	528
38	450494	5733	7927	5674	1277	630	215163	200976	498	351
39	447897	4718	7295	5215	250916	333	214911	755	303	177175
40	5364	3712	6668	4758	557	231036	658	535	188108	176999
41	2895	2716	6043	4303	250199	230740	406	315	187913	823
42	440486	1730	5423	3850	249841	445	214155	200096	718	648
43	438132	350755	4806	3399	486	230151	213903	199877	523	473
44	5833	340787	4194	272951	249132	229859	654	658	329	298
45	3585	8830	3586	504	248779	567	404	440	187135	176124
46	431387	7881	2980	272060	427	229275	213155	223	186942	175950
47	429236	6942	2379	1617	248076	228984	212907	199007	749	776
48	7130	6011	1781	1176	247727	695	659	198790	557	602
49	5068	5089	1186	270737	378	406	413	574	364	429
50	3047	4175	300596	270300	247031	228118	212166	358	186173	256
51	421067	3269	300008	269865	6685	227830	211920	198143	185981	175084
52	419125	2372	299424	431	6341	544	674	197939	790	174911
53	7220	1482	8843	269000	245997	227258	430	714	599	739
54	5351	340600	8266	268570	655	226973	211185	500	409	567
55	3515	339726	7692	8142	245313	689	210942	286	218	396
56	411713	8860	7121	7716	244973	406	699	197073	185029	224
57	409942	8001	6553	7292	634	226123	457	196860	184839	174053
58	8203	7149	5989	266870	244297	225842	210214	648	650	173882
59	6493	6305	5428	449	3960	561	209973	437	462	711
60	404813	335467	294870	266030	243625	225280	209732	196226	184273	173541
	89	88	87	86	85	84	83	82	81	80