VI. *Observationes* Martis, *Autumno Anni* 1736. Berolini *habitæ*, *a* Christfr. Kirch, Regiæ Societatis *ibidem Astronomo.*

I.
Conjunctio Martis & μ ♓.

I. Diebus 10, 11 & 12 Octobris, cum ♂ prope μ ♓, stellam 5 magnitudinis transiret, sequentes observari distantias centri Martis a dicta stella.

Stylo novo.	Temp. vero.			Partes Micro.	Valor p. Micr.
	H. ′				′ ″
D. 10 Octobr.	9. 41. vesp.	♂ μ ♓	Tub. 7 ped.	48½	19. 24.
	9. 46.	. .	Tub. 9 ped.	65	19. 21.
D. 11 Octobr.	10. 1.	♂ μ ♓	Tub. 9 ped.	22½	6. 42.
	10. 4.	. .	Tub. 7 ped.	16	6. 24
	10. 9.	. .	Tub. 7 ped.	16½	6. 36.
	10. 12.	. .	Tub. 9 ped.	22	6. 33.
D. 12 Octobr.	8. 55. vesp.	♂ μ ♓	Tub. 9 ped.	71½	21. 18.
	8. 59.	. .	Tub. 7 ped.	53	21. 12.
	9. 5.	. .	Tub. 7 ped.	53½	21. 24.

II. Ut ex his distantiis observatis eruerem Tempus conjunctionis Martis cum stella μ ♓, elegi 3 distantias sequentes.

	H. ′	′ ″
1. D. 10. Octobr.	9. 43. vesp. dist. centri ♂ a μ ♓	19. 22.
2. D. 11. Octobr.	10. 6. vesp. . . .	6. 34.
3. D. 12. Octobr.	9. 0. vesp. . . .	21. 18.

Et ex ephemeridibus ſuppoſui motum diurnum Martis in longitudine 19′ 30″, in latitudine 3′ 40″: eſt itaque motus diurnus Martis in orbita propria 19′ 51″, & angulus orbitæ Martis & eclipticæ (ſeu potius cum parallelo eclipticæ) 10° 39′.

III. Datis in triangulo obliquangulo $a\,\mu\,b$, tribus lateribus, [vid. Fig. I. TAB. IV.] ſcilicet

ab, motu Martis, qui competit 24h. 23′. (ſcilicet tempori inter obſervationem 1 & 2) . . 20′ 10″.

$a\,\mu$, diſtantia primo obſervata . . . 19 22.

$b\,\mu$, diſtantia ſecundo obſervata . . 6 34.

Duxi $a\,\mu$ perpendicularem in orbitam Martis apparentem $\mu\,\chi$, & in triangulo rectangulo $b\,\chi\,\mu$ quæſivi particulam orbitæ Martis, $b\,\chi$, eamque inveni 1′ 51″. & diſtantiam minimam ♂ & μ, $\chi\,\mu$, quam inveni 6 18.

Particulæ orbitæ Martis, $\chi\,b$, competunt 2h. 14′

Quæ ſubtracta a tempore 2 obſervationis D. 11. Octobr. . . .	10	6. veſp.
Relinquunt temp. ver. ♂ ☌ μ ☌ in orbita D. 11. Octobr. . . .	7	52. veſp.

IV. In triangulo obliquangulo $b\,\mu\,c$, motus Martis inter 2 & 3 obſervationem, bc, eſt . . 18′ 55″.

Diſtantia ♂ a μ ☌ ſecundo obſervata, $b\,\mu$ 6 34.

Diſtantia ♂ a μ ☌ tertio obſervata, $c\,\mu$. 21 18.

Datis his tribus lateribus quæſivi angulum c, eumque inveni 17° 35′. Deinde duxi perpendicularem a μ in orbitam Martis, $\mu\,\chi$, & in triangulo rectangulo $c\,\chi\,\mu$; data hypotenuſa $c\,\mu$, quæſivi latera $\mu\,\chi$, & $c\,\chi$, & inveni $\mu\,\chi$, diſtantiam minimam 6′ 26″. & $c\,\chi$, 20′ 18″.

A quo ſubtractum latus bc . . . . . 18 55.

Relinquit $b\,\chi$ . . . . . 1 23.

Cui

Cui competunt in tempore . . . 1h. 40′.
Quæ ſubtracta a tempore 2 obſervationis 11 Octobr. . . . . } 10 6. veſp.
Dant tempus verum diſtantiæ minimæ, ſive conjunctionis Martis & μ ♓ in orbita 11 Octobr. . . . } 8 26. veſp.

V. Deducta in his duobus proxime antecedentibus paragraphis, ut fieri ſolet, paululum inter ſe differunt. Si motum Martis diurnum quadrante circiter minuti minorem aſſumſiſſem, diſcrepantia foret minor. Interim, ſi ex deductionibus utriſque medium eligo, a veritate vix aut parum aberrare potero. Et ſic colligitur *tempus verum* ♂ ☍ μ ♓ *in orbita Martis*, 11 *Oct.* 8h. 9′. *diſtantia minima* ♂ *a* μ ♓ 6′ 22″. *Septentrionalis.*

VI. Quamvis hæc ſufficere mihi potuiſſent, tamen de novo calculum inſtitui, ſupponens motum ♂ diurnum in longitudine . . . . . 19′ 15″.
in latitudine . . . . . 3 40.
Fuit itaque motus ♂ diurnus in orbita . . 19 36.
Et angulus orbitæ Martis cum parallelo eclipticæ 10° 47′ intervalla temporum inter obſervationem 1 & 2, & inter 2 & 3, dato hoc motu Martis diurno in orbita 19′ 36″, dant *ab* 19′ 55″, & *bc* 18′ 42″; diſtantiæ *a* μ, *b* μ, & *c* μ, manent eædem, quæ in ſuperioribus calculis. His datis primo per triangulum *a b* μ, inveni μ ☌ 6′ 22″, & *b* ☌ 1′ 37″ ½.
Quibus reſpondent . . . . . 1h. 59′.
quæ ſubtracta a D. 11 Octobr. 10 6. veſp.
Relinquunt tempus diſtantiæ minimæ D. 11 Octobr. . . . . } 8 7. veſp.
Deinde per triangulum *b c* μ, inveni μ ☌ 6′ 21″.

Et

Et $b\chi$ 1′ 38″, quibus reſpondent in tempore	2h.	0′.	
Quæ ſubtracta a temp. 2 obſervationis D. 11 Octobr. . . .	10	6.	veſp.
Relinquunt tempus diſtantiæ minimæ D. 11 Octobr.	8	6.	veſp.

Ut itaque hi calculi optime inter ſe, & cum ſupra electo medio priorum calculorum, conveniant.

VII. Si ex μ ducitur linea recta μd, quæ cum linea $\chi\mu$, perpendiculari in orbitam Martis, ad μ faciat angulum æqualem angulo orbitæ Martis cum parallelo eclipticæ, $d\mu$ erit perpendicularis in eclipticam. Hunc angulum primo deduxi 10° 39′ (§. II.) deinde mutato ſive correcto motu diurno Martis, eum inveni 10° 47′ (§. VI.) In triangulo rectangulo $d\chi\mu$, jam præter angulos notum eſt latus $\chi\mu$ 6′ 22″, & reliqua latera quæruntur. Aſſumto angulo $\chi\mu d$, 10° 39′ latus χd eruitur 1′ 12″. Si vero correctiorem angulum adhibeo 10° 47′, illud latus χd erit 1′ 13″.

Cui competunt in tempore	1h.	29′.	
Quæ addita ad tempus diſtantiæ minimæ 11 Octobr.	8	7.	
dant *tempus verum* ♂ ☌ ☍ μ ♓ *in ecliptica* 11 *Octobr.*	9	36.	

$d\mu$, ſive differentia latitudinis Martis a latitudine ſtellæ in ♂ in ecliptica, eruitur . 6′ 29″.

Quæ ſubtracta a latitudine ſtellæ .	3°	4	25. Mer.
Relinquit *Latitudinem Martis* .	2	57	56. Mer.

Longitudo Martis eſt æqualis longitudini ſtellæ, ſcilicet ex accuratiſſimo *ſtellarum inerrantium catalogo Britannico* . . . . . ♈. 19° 25′ 40″.

VIII.

VIII. Ad tempus conjunctionis Martis & μ ♓ in ecliptica, ſcilicet Berolini, tem. vero. 11 Oct. 9h. 36′.
Et Bononiæ tempore medio . . 11 Oct. 9 14.
Ex ephemeridibus Cel. Manfredii eruitur longitudo Martis . } ♈. 19° 14′ 40″.
Quæ deficit ab obſervatione . . . . . 11 0.
Ephemerides Ghiſlerii dant longit. ♂ ♈. 19° 4′ — 22 fere minutis ab obſervatione defi- cientem, & ephemer. Dni. Deſplaces } ♈. 19 25 — Obſervationi ſatis congruam.

Manfredianæ ephemerides dant latitudinem Martis meridionalem . . . . . 2° 57′.—
Id eſt; 1 minuto fere minorem latitudine obſervata; ex ephemeridibus Ghiſlerianis illa colligitur . 2° 57′½.
& ex Deſplaces ephemeribus . . . . 2 59½.

II.

Locus Martis in oppoſitione Solis.

I. Tempore conjunctionis Martis & μ ♓ in ecliptica, ex Manfredianis ephemeridibus eruitur locus Solis . . . . . 6 ♎ 18° 46′ 21″.
Quo tempore longitudo Martis fuit 0 ♈ 19 25 40.
Itaque ♂ fere fuit in oppoſitione Solis, & tantum 39′ 19″. abfuit a loco Soli oppoſito.
Motus diurnus Solis fuit . . . . 0° 59′ 34″.
Et Martis retrogradi motus diurn. in eclipt. 19 15.
Summa dat motum ☉ a ♂ diurnum . 1 18 49.

II. Ut 1° 18′ 49″. motus diurnus ☉ a ♂, ad 24 horas, ita 39′ 19″ diſtantia ♂ ab oppoſito Solis ad 11h 58′.
Quæ addita ad tempus verum ♂ ♂ μ ♓ in ecliptica 11 Octobr. . . . . } 9 36.

Dant

Dant *tempus oppoſitionis Martis & Solis Berolini, tempore vero* 11 *Oct.* .	21h	34′.	
Æquatio temporis ſubtrahatur . . .			13½.
Et reſtabit tempus medium Berolini 11 Oct.	21	20½.	
Pro differentia meridianorum inter Bononiam & Berolinum ſubtrahe .			8½.
Reſtat tempus medium Bononiæ 11 Oct.	21	12.	

III. Ut 24 horæ ad 19′ 15″ motum diurnum Martis in longitudine, ita 11h. 58′. tempus inter ♂ ☌ & μ ♓ in ecliptica & oppoſitionem ☉ & ♂, ad 0° 9′ 36″.

Quæ ſubtracta a Long. ♂ in ☌ ☌ & μ ♓	0	♈ 19	25 40.
Relinquunt *Longitud.* ♂ *in* ☌ ☉ .	0	♈ 19	16 4.
Locus Solis ex ephemeridibus Manfredianis D. 11. Oct. 21h. 12′. tempus medium Bononiæ eruitur . .	6	♎ 19	16 3.

Differentia tantum unius minuti ſecundi (præter ſemicirculum) a loco Martis, quæ tuto negligitur.

VI. Ut 24 horæ ad 3′ 40″, motum diurnum Martis in latitudine, ita 11h. 58′ ad . 0° 1′ 50″.

Quæ ſubtracta a Latitudine Martis In conjunctione ♂ & μ ♓ in ecliptica	2	57	56 Mer.
Relinquunt *Latitudinem* ♂ *in* ☌ ☉	2	56	6 Mer.

III.

Obſervationes Martis circa ſtationem ejus ſecundam, menſe Novembri, *ann.* 1736.

Verſabatur Mars inter ſtellas *e*, ε & ζ Piſcium, aliaſque ſtellas minores; a quibus diſtantias Martis ſæpius dimenſus ſum, tribus diverſis tubis, ſcilicet tubo 7, tubo 9, & tubo 2 pedum, ſemel etiam tubo 18 pedum. Per tubos longiores diſtantiæ accuratiores capi poſſunt: quia vero ſpatium non adeo magnum ſimul comprehendunt, minores tantum diſtantias per ipſos

ipſos dimetiri potui. Per tubum 2 pedum majores quidem diſtantiæ obſervari potuerunt; illæ tamen non adeo accuratæ eſſe ſolent, quin aliquando dubium 1 vel 2 minutorum irrepere poſſit, præſertim ſi diſtantiæ nimis magnæ ſunt, ut capacitatem tubi fere expleant. Tales errores maxime ſe produnt, quando ſitus ſtellarum in chartam delineatur, & diſtantiæ planetæ a diverſis ſtellis, non in uno puncto, ſe interſecant. Excerpſi ſtellas, a quibus Martem dimenſus ſum, ex catalogo Britannico, & per diſtantias Martis ab his ſtellis, locum planetæ ope circini indagavi. Primo enarrabo diſtantias captas; deinde exhibebo loca Martis per illas eruta. Ubi notandum eſt, me delineatione uſum fuiſſe, in qua magnitudines graduum, & diſtantiæ ſtellarum, duplæ fuerunt earum, quas ſchema adjectum exhibet. [Vid. Fig. 2. TAB. IV.]

Stylo novo.	Temp. vero veſperi.			Partes Microm.	Valor partium Microm.
	H. ′				° . ′ . ″ .
D. 27 Oct.	8. 58.	♂ e ♓	Tub. 7 ped.	121.	0. 48. 24.
D. 29 Oct.	8. 30	♂ e ♓	Tub. 7 ped.	6.	24. 48.
	8. 38.	. .	Tub. 9 ped.	83.	24. 43.
D. 1 Nov.	11. 6.	♂ e ♓	Tub. 9 ped.	38.	11. 18.
	11. 10.	. .	Tub. 7 ped.	28.	11. 12.
D. 5 Nov.	7. 22.	♂ a.	Tub. 7 ped.	34½.	13. 48.
	7. 26.	♂ e ♓	. . .	100½.	40. 12.
	8. 14.	♂ c.	. . .	105.	42. 0.
	8. 21.	♂ a.	Tub. 9 ped.	44.	13. 6.
D. 6 Nov.	7. 28.	♂ a.	Tub. 7 ped	17.	6. 48.
	7. 34.	♂ e ♓	. . .	116.	46. 24.
	7. 40.	♂ c.	. . .	110.	44. 0.
		vel.		110½.	44. 12.
	7. 44.	♂ a	Tub. 9 ped.	23½.	6. 59.

Stylo novo.	Temp. vero veſperi.			Partes Micro.	Valor partium Microm.
	H. ′				° ′ ″
D. 7 Nov.	6. 4.	☌ *a.*	Tub. 18 ped	16.	2. 17.
	7. 47.	☌☌ *a* diffic.	Tub. 7 ped	5½.	2. 12.
	7. 50.	☌☌ *e* ♓	. . .	129.	51. 36.
	7. 53.	☌ *c.*	. . .	118.	47. 12.
D. 12 Nov.	9. 19.	☌☌ *a.*	Tub. 7 ped	52.	0. 20. 48.
	9. 27.	☌☌ *e* ♓	. . .	172.	1. 8. 48.
	9. 38.	☌☌ *c.*	. . .	165.	1. 6. 0.
D. 13 Nov.	7. 32.	☌☌ *a.*	Tub. 9 ped.	77.	0. 22. 56
	7. 36.	☌☌ *a.*	Tub. 7 ped.	58.	0. 23. 12.
	7. 40.	☌☌ *e* ♓.	. . .	175.	1. 10. 0.
	7. 44.	☌☌ *c.*	. . .	171.	1. 8. 24.
D. 15 Nov.	7. 2.	☌☌ *a.*	Tub. 7 ped.	72.	0. 28. 48.
	7. 9.	☌☌ *e* ♓.	. . .	179.	1. 11. 36.
	7. 13.	☌☌ *c.*	. . .	186½.	1. 14. 36.
	7. 18.	☌☌ *a.*	Tub. 9 ped.	96.	0. 28. 35.
D. 26 Nov.	6. 11.	☌☌ *e* ♓.	Tub. 2 ped.	91.	1. 22. 6.
		☌☌ ♌ ♓.	. . .	106.	1. 35. 38.
		☌☌ ♎ ♓.	. . .	94.	1. 24. 48.
		☌☌ *c.*	. . .	143.	2. 9. 2.
		☌☌ *a.*	. . ♓.	113.	1. 41. 57.
		☌☌ *e* ♓.	. . .	92.	1. 23. 0.
	6. 32.	☌ *a.*	. . .	103.	1. 32. 55.
D. 28 Nov.	6. 43.	☌☌ *e* ♓.	Tub. 2 ped.	104.	1. 33. 50.
	6. 46.	☌☌ ♌ ♓.	. . .	82.	1. 13. 59.
	9. 34.	☌☌ ♎ ♓.	. . .	103.	1. 32. 55.
	9. 37.	☌☌ *e* ♓.	. . .	105.	1. 34. 44.
	9. 41.	☌☌ ♌ ♓.	. . .	82.	1. 13. 59.
		melius.		81.	1. 13. 5.
D. 3. Dec.	9. 41.	☌☌ *e* ♓.	Tub. 2 ped.	160.	2. 24. 23.
		☌☌ ♎ ♓.	. . .	157.	2. 21. 40.
	9. 52.	☌☌ ♌ ♓.	Tub. 7 ped.	56.	0. 22. 24.
	10. 1.	☌ ♌ ♓.	Tub. 9 ped.	75½.	22. 29.
		vel.		76.	22. 38.
D. 6. Dec.	5. 33.	☌☌ ♎ ♓.	Tub. 2 ped.	201.	3. 1. 22.
	5. 39.	☌☌ *e* ♓.	. . .	204.	3. 4. 4.
	5. 44.	☌☌ ♌ ♓.	. . .	50.	0. 45. 8.
		☌☌ ♍ ♓.	Tub. 7 ped.	113½.	0. 45. 24.
	5. 57.	☌ ♌ ♓.	Tub. 9 ped.	153.	0. 45. 34.

Hæ diſtantiæ ſemper a centro Martis intelligendæ ſunt, præſertim per tubos longiores.

Sequuntur loca Martis, ex diſtantiis recenſitis deducta, & loca ejuſdem ex diverſis ephemeridibus excerpta, ut conſenſus ſive diſſenſus appareat inter calculos & obſervationem.

Stylo novo.	T. ver. veſperi.		Longitudo Martis.	Latitudo Martis.
	H. ′.		☿ ′ ″.	○ ′ ″.
D. 5 Nov.	8. 18.	Obſervatio	♈ 13. 37. 0.	1. 17. 0. M.
		Manfredii.	13. 26. —	1. 16. 30.
		Ghiſlerii.	13. 42. —	1. 20. 30.
		Deſplaces.	13. 35. 30.	1. 17. 30.
D. 6 Nov.	7. 26.	Obſervatio	♈ 13. 32. 0.	1. 13. 15. M.
		Manfredii.	13. 22. —	1. 13. —
		Ghiſlerii.	13. 37. 30.	1. 16. —
		Deſplaces.	13. 31. —	1. 14. —
D. 7 Nov.	7. 50.	Obſervatio	♈ 13. 27. 40.	1. 9. 30 M.
		Manfredii.	13. 17. 40.	1. 9. 20.
		Ghiſlerii.	13. 32. 40.	1. 12. —
		Deſplaces.	13. 27. —	1. 10. —
D. 12 Nov.	9. 28.	Obſervatio	♈ 13. 20. 0.	0. 50. 40. M.
		Manfredii.	13. 8. —	0. 51. —
		Ghiſlerii.	13. 19. 30.	0. 53. —
		Deſplaces.	13. 18. —	0. 51. 30.
D. 13 Nov.	7. 38.	Obſervatio	♈ 13. 20. 30.	0. 48. 0. M.
		Manfredii.	13. 9. 15.	0. 48. —
		Ghiſlerii.	13. 19. —	0. 49. 30.
		Deſplaces.	13. 19. —	0. 48. —
D. 15 Nov.	7. 12.	Obſervatio	♈ 13. 23. 30.	0. 42. 0. M.
		Manfredii.	13. 13. —	0. 41. —
		Ghiſlerii.	13. 21. 30.	0. 43. —
		Deſplaces.	13. 21. 30.	0. 41. —
D. 26 Nov.	6. 20.	Obſervatio	♈ 14. 35. 0.	0. 9. 0. M.
		Manfredii.	14. 26. —	0. 9. —
		Ghiſlerii.	14. 37. —	0. 12. —
		Deſplaces.	14. 34. —	0. 9. 30. M.

Stylo novo.	T. ver. veſperi.		Longitudo Martis.	Latitudo Martis.
	H. ′.		° . ′ . ″ .	° . ′ . ″ .
D. 28 Nov.	9. 35.	Obſervatio	♈ 14. 57. 0.	0. 3. 30. M.
		Manfredii.	14. 49. 30.	0. 4. — M.
		Ghiſlerii.	14. 59. —	0. 7. — M.
		Deſplaces.	14. 57. 30.	0. 5. — M.
D. 3 Dec.	9. 48.	Obſervatio	♈ 16. 1. 0.	0. 6. 30. S.
		Manfredii.	15. 57. —	0. 7. 40. S.
		Ghiſlerii.	16. 3. —	0. 5. — S.
		Deſplaces.	16. 2. —	0. 7. — S.
D. 6 Dec.	5. 46.	Obſervatio	♈ 16. 46. —	0. 16. — S.
		Manfredii.	16. 40. 30.	3. 13. 30.
		Ghiſlerii.	16. 47. 30.	0. 10. 30.
		Deſplaces.	16. 50. 33.	0. 13. 30. S.

Duobus ultimis diebus, ſcilicet 3. & præſertim 6 Decembris, loca Martis, ex obſervatione deducta, ſunt incerta: Illa itaque, ſi cui ita viſum fuerit, plane omitti poſſunt.

Loca ſtellarum fixarum in ſchemate adjecto, ex catalogo Britannico ad initium anni 1690. ſine ulla reductione excerpta ſunt: quare longitudinibus Martis, quas figura nobis exhibuit, 39′ 0″, vel 39′ 5″, addenda fuerunt, pro motu ſtellarum fixarum in 46 annis, & 10 vel 11 circiter menſibus.

Omiſſæ ſunt ſupra obſervationes diei 9 Novembr. quas hic adjiciam, cum loco Martis ex illis deducto.

Stylo novo.	Temp. vero veſperi.			Partes Micro.	Valor partium Microm.
	H. ′.				
D. 9 Nov.	9. 28.	♂ *a.*	Tub. 7 ped.	25.	0. 10. 0.
	9. 30.	♂ *e* ♓.	. . .	152.	1. 0. 48.
	9. 34.	♂ *c.*	. . .	136.	0. 54. 24.
	9. 41.	♂ *a.*	Tub. 9 ped.	32½.	0. 9. 40.

Stylo

Stylo novo.	Temp. vero veſperi.		Longitudo Martis.	Latitudo Martis.
			☉. ′. ″.	☉. ′. ″.
D. 9 Nov.	9. 34.	Obſervatio	♈ 13. 22. 20.	1. 1. 30. M.
		Manfredii.	13. 22. —	1. 0. 30.
		Ghiſlerii.	13. 11. —	1. 3. 30.
		Deſplaces.	13. 25. —	1. 2. 30.

VII. *A Collection of the* Obſervations *of the Remarkable* Red Lights *ſeen in the Air on* Dec. 5. 1737. *ſent from different Places to the* ROYAL SOCIETY.

1. *An Account of the* Red Lights, *on* Dec. $\frac{5}{16}$. 1737. *as obſerved* (*at* Naples) *by the Prince of* Caſſano, F. R. S. *and by him ſent in a Letter to the* Preſident: *Tranſlated from the* Italian *by* T. S. *M. D.* F. R. S.

A *Phænomenon* of a fiery Meteor is my Motive for troubling you, Sir, with this other ſhort Narrative; being perſuaded that it will be as agreeable to you to peruſe, as it was to me to draw it up with all the Circumſtances of Truth, to which I was an Eye-witneſs.

Dec. 16. 1737. (*N. S.*) in the Evening, the Sun being about 25 Degrees below the Horizon, a Light was obſerved in the North, as if the Air was on Fire, and flaſhing; the Intenſeneſs of which gradually increaſing, at the Third Hour of the Night it ſpread Weſtward in ſuch a Manner, that if a Perpendicular was let fall from the Polar Star, and afterwards a

Pa-

Fig. 1.

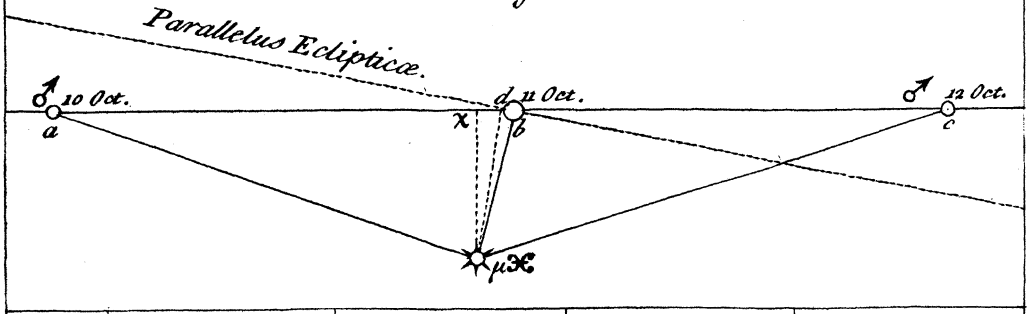
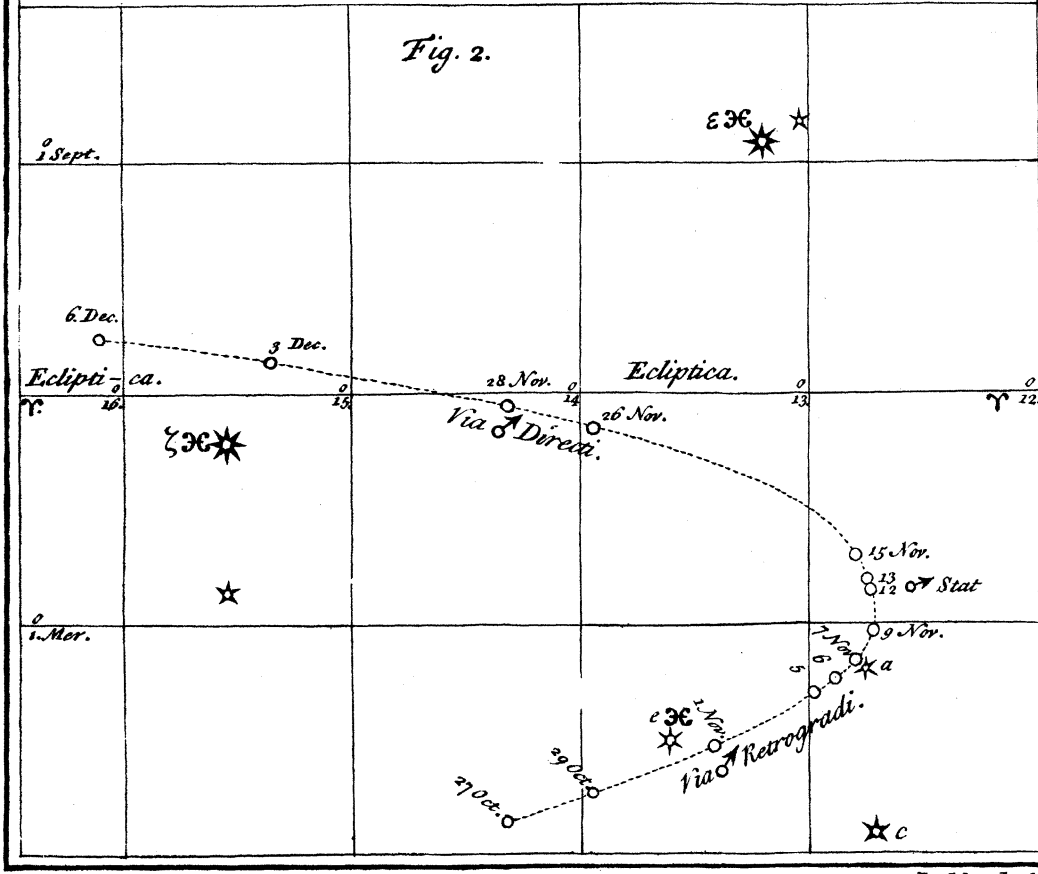


Fig. 2.



J. Mynde sc.