Ejusdem Doctoris *WALLISII* Non-nulla, De *Centro Gravitatis Hyperbolæ*, Prægressæ Epistolæ subnexa.

T*Andem vero, ne nihil habeas præter* Confutatum Hobbium,(*quæ fortè non tanti res est, ut de ea multum sis solicitus*;) *libet hic annectere*, De Centro Gravitatis Hyperboles *nonnihil*; (*præterito Anno conscriptum*;) *Miscellaneis illis, si placet subjungendum, quæ habemus ad* Prop. 1. Cap. XV. De Motu. *Nempe*, pag. 753. l. 26. ibidem.

Post §. 10. *Hæc addantur.*

11. *Etiam hoc addo* Spatii Hyperbolici, sive interioris sive exterioris, *non quidem ipsum Gravitatis Centrum, sed Rectam in quâ est, seu* Axem Æquilibrii exhiberi posse, etiamsi ignoretur Plani Magnitudo.

Vid. Tab. II Fig. 4. *Esto enim exposita Hyperbola* HhV, *Centrum* A, *axis* AX, *vertex* V, *latus rectum* L, *axis transversus* $T=2S$, *axes intercepti* $VD=D$, $Vd=d$, *ordinatim-applicatæ* $HD=H$, $hd=h$, *axis conjugatus* $A\Delta$, *ad quem ordinatim-applicatæ* $H\Delta=K$, $h\delta=k$, *asymptotarum alteri* $A\sigma$ *parallela* $HS=B$ *ad alteram* $AS=A$ *ordinatim-applicetur*, & VO *ad* $AO=E$, & hs *ad* As; *atq; intelligatur* $SA\sigma$ *angulus rectus*; *sitque* $OS\ (=A-E)=O$.

Sunt (*propter* $h=\surd : dL+\frac{L}{T}d^2 :$) *ordinatarum ad axem semi-quadrata, seu momenta respectu* AD, $\frac{1}{2}Ld+\frac{L}{2T}d^2$; & (*propter* Omn : d, $=\frac{1}{2}D^2$, & Omn . $d^2, =\frac{1}{3}D^3$,) *simul omnia, seu Momentum totius* HVD *respectu* AX, $\frac{1}{4}LD^2+\frac{L}{6T}D^3$.

Idem (*propter* $k=\surd : S^2+\frac{T}{L}h^2 :$) *ordinatarum ad axem conjugatum semi-quadrata, seu momenta respectu* $A\Delta$, $\frac{1}{2}S^2+\frac{T}{2L}h^2$; & (*propter* Omn . $h^2, =\frac{1}{3}H^3$,) *simul omnia, seu totius* $AVH\Delta$, *momentum respectu* $A\Delta$, $\frac{1}{2}S^2H+\frac{T}{6L}H^3$. *Quod ex* (*totius* $ADH\Delta$ *momento*) $\frac{1}{2}K^2H = \frac{1}{2}S^2H+\frac{T}{2L}H^3$ *subductum, relinquit residui* HVD, *respectu* $A\Delta$, *momentum* $\frac{T}{3L}H^3$.

Ergo (*propter distantias momentis proportionales*,) *in* DH, *sumptâ* DG, *quæ sit ad* AD, *ut* $\frac{1}{4}LD^2+\frac{T}{6T}D^3$ *ad* $\frac{T}{3L}H^3$; *hoc est*, $3TL^2D^2+2L^2D^3$ *ad* $4T^2H^3$; *erit in* (*junctâ*) AG, *ipsius* HVD *centrum Gravitatis*; *utpote cujus puncta singula in eâ ratione distant ab* AD, $A\Delta$.

Idem obtinebitur ope momenti ipsius HVD *respectu Asymptotæ* $A\sigma$.

Est (*per* § D Prop. 31. Cap. 5.) *ipsius* $OVHS$, *respectu* $A\sigma$, *momentum* ABO. *Est autem Trianguli* $ASX\ (=\frac{1}{2}A^2,)$ *respectu ejusdem* $A\sigma$, *momentum* $\frac{1}{3}A^3$; & *Trianguli* AOV *momentum* $\frac{1}{3}E^3$; *positisque* $HX(=A-B)=X$, & DB (*parallelâ* AS) $=Y$, *adeoque* $HDX=\frac{1}{2}XY$, *hujusque ab* $A\sigma$ *distantiâ centri Gravitatis* $A-\frac{1}{3}Y$, *erit Trianguli* HDX, *respectu* $A\sigma$, *momentum* $\frac{1}{2}AXY-\frac{1}{6}XY^2$. *Ergo* (*propter* $HVD=ASX-AOV-OVHS-HDX$) *ipsius* HVD, *respectu* $A\sigma$, *momentum* $\frac{1}{3}A^3-\frac{1}{3}E^3-ABO-\frac{1}{2}AXY+\frac{1}{6}XY^2$.

Ergo

Ergo (*propter distantias momentis proportionales*) *in DH sumptâ DQ, quæ sit ad AS, ut* $\frac{1}{4}LD^2+\frac{L}{6T}D^3$ *ad* $\frac{1}{3}A^3-\frac{1}{3}E^3-ABO-\frac{1}{2}AXY+\frac{1}{6}XY^2$; *ductâque QK parallelâ AX occurrente SX in K; erit in* (*juncta*) *AK*, (*utpote cujus singula puncta in ea ratione distant ab AD, Aσ,*) *Centrum gravitatis HVD. Quæ quidem AK est eadem positione recta cum AG; quoniam utraq; tum per A transit, tum per Centrum Gravitatis HVD.*

Similiter (*ob eandem causam,*) *in* ΔH *sumpta* ΔL, *quæ sit ad AS, ut* $\frac{T}{3L}H^3$ *ad* $\frac{1}{3}A^3-\frac{1}{3}E^3-ABO-\frac{1}{2}AXY+\frac{1}{6}XY^2$; *ductaque LK parallelâ* $A\Delta$, *occurrente SX in K; erit in* (*juncta*) *AK* (*cujus utique singula puncta in ea ratione distant ab* $A\Delta$, *Aσ,*) *centrum gravitatis HVD. Erit autem hoc K idem quod prius, ob causam modò insinuatam.*

12. *Simili processu utendum in spatio exteriori OVHS.*

Est enim (*ut jam ostensum*) *hujus, respectu Aσ, momentum* ABO.

Item, respectu AX, Trianguli $ASX=\frac{1}{2}A^2$ *est* (*propter centri ab AX distantiam* $\frac{1}{3}A\sqrt{\frac{1}{2}}$) *momentum* $\frac{1}{6}A^3\sqrt{\frac{1}{2}}$; *& similiter, Trianguli AOV, momentum* $\frac{1}{6}E^3\sqrt{\frac{1}{2}}$; *Trianguli que* $HDX=\frac{1}{2}XY$ (*propter distantiam* $\frac{1}{3}H$) *momentum* $\frac{1}{6}XYH$; *ipsiusque HVD* (*ut modò*) $\frac{1}{4}LD^2+\frac{L}{6T}D^3$. *Ergo* (*propter* $OVHS=ASX-AOV-HDX-HVD$,) *ipsius OVHS, respectu AX, momentum* $\frac{1}{6}A^3\sqrt{\frac{1}{2}}-\frac{1}{6}E^3\sqrt{\frac{1}{2}}-\frac{1}{6}XYH-\frac{1}{4}LD^2-\frac{L}{6T}D^3$.

Ergo (*propter distantias momentis proportionales,*) *in DH, sumpta DI, quæ sit, ad AS, ut* $\frac{1}{6}A^3\sqrt{\frac{1}{2}}-\frac{1}{6}E^3\sqrt{\frac{1}{3}}-\frac{1}{6}XYH-\frac{1}{4}LD^2-\frac{L}{6T}D^3$ *ad ABO: ductaque IF parallelâ AX, occurrente SX in F; erit in* (*juncta*) *AF* (*cujus puncta singula in ea ratione distant ab AX, Aσ,*) *centrum gravitatis OVHS.*

Idem obtinebitur comparando ejusdem OVHS momenta respectu Aσ, & $A\Delta$; *vel AX, &* $A\Delta$; *eandem autem AF prodire necesse erit, ut quæ transire debeat tum per A, tum per ipsius OVHS centrum gravitatis.*

13. *Simili item processu utendum est in spatio exteriori* $AVH\Delta$.

Est enim (*ut modò*) *hujus respectu* $A\Delta$ *momentum* $\frac{1}{2}S^2H+\frac{T}{6L}H^3$.

Idem, respectu AX; rectanguli $ADH\Delta$ *momentum* $\frac{1}{2}KH^2$; *unde subducto ipsius HVD momento* $\frac{1}{4}LD^2+\frac{L}{6T}D^3$; *habebitur ipsius* $AVH\Delta$ *respectu AX momentum* $\frac{1}{2}KH^2-\frac{1}{4}LD^2-\frac{L}{6T}D^3$.

Ergo, in ΔH, *sumpta* ΔM, *quæ sit ad DH, ut* $\frac{1}{2}S^2H+\frac{T}{6L}H^3$ *ad* $\frac{1}{2}KH^2-\frac{1}{4}LD^2-\frac{L}{6T}D^3$; *erit in* (*juncta*) *AM* (*cujus singula puncta in ea ratione distant ab* $A\Delta$, *AX,*) *centrum gravitatis* $AVH\Delta$.

Idemque obtinebitur comparatis ejusdem momentis respectu $A\Delta$, *& Aσ; vel respectu AX, & Aσ: eandem autem AM prodire necesse erit, ob causam ante insinuatam: Ut non sit spes inde, ob duas ejusmodi rectas, se mutuò decussantes, ipsum centrum obtinendi, absque Plani magnitudine.*

Si verò in his omnibus vel non sit SAσ ang. rectus; vel Hyperbola, vel Scalena (*sumptâ Diametro quavis aliâ loco Axis AX;*) *similis adhibenda erit accommodatio cum ea, quam de Scalenis insinuavimus ad* § K prop. 31. c. 5.

Dab. Oxon. Aug. 31. 1672.

Trans. N°27.

Tab. II.

Fig. I.

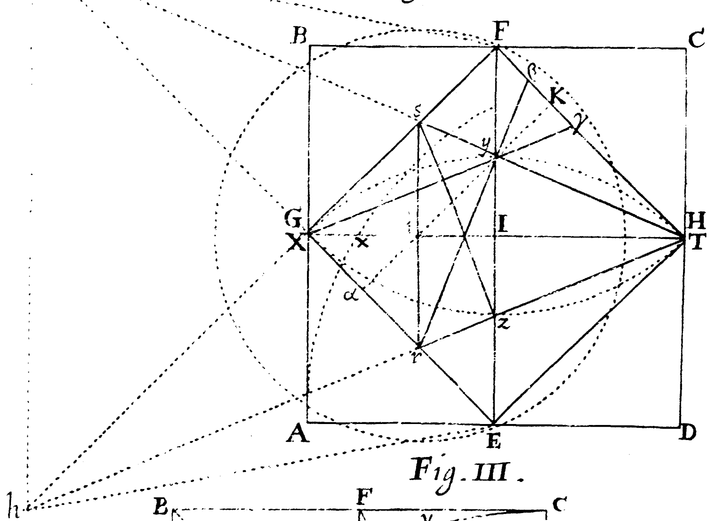

Fig. II.

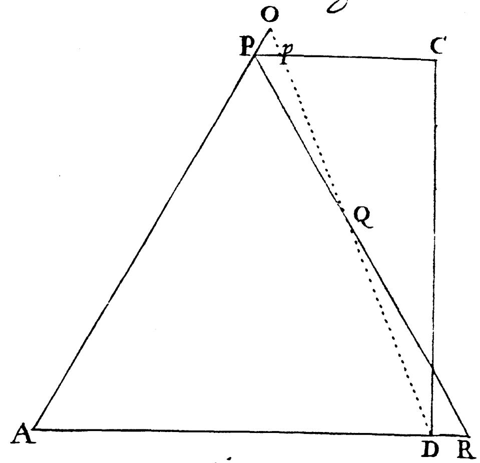

Fig. III.

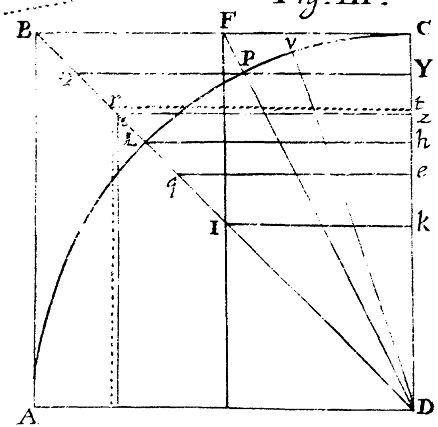

Fig. IV.