A LETTER,

Written by Dr. John Wallis *to the* Publiſher, *concerning the Variety of the* Annual *High-Tydes, as to ſeveral places; with reſpect to his own* Hypotheſis, *deliver'd* N°. 16, *touching the Flux and Reflux of the Sea.*

SIR, In my *Hypotheſis* for Tydes, you may remember, that I caſt the *Annual* High-Tydes not on the *Two Æquinoxes*, about the 11. of *March* and *September*; nor yet on the *Apogæum* and *Pegæum* of the *Sun*, about the middle of *June* and *December*; but (as proceeding from a Complication of thoſe two Cauſes) on a Midle time between the *Perigæum* and the *two Æquinoxes*, (like as is the greateſt Inequality of the *Natural daies*, proceeding from a Complication of the ſame Cauſes.) And particularly, for the Coaſt of *Kent* (and conſequently the Rivers of *Thames* and *Medway*) about the beginning of *November* and *February*: which agrees with Obſervations on thoſe *Coaſts*, and particularly with that of yours of *Febr.* 5. this year.

The laſt year, when I was preſent in the *R. Society*, I remember, an account was brought us of the *Annual* High-Tydes on the *Severn*, and at *Chepſtow-bridge*, to be about the *beginning* of *March*, and the *end* of *September*. Which though they agree not with the particular times on the coaſt of *Kent*, yet in the general they agree thus far, That the one is about as much *before* the *one* Æquinox, as the other is *after* the *other* Æquinox. You now acquaint me with High-Tides about *February* 22. about the coaſt of *Plimouth*, which is later than that of the coaſt of *Kent*, but ſooner than that on the *Severn*. And I doubt not but in other parts of the world will be found other Varieties.

The reaſons of theſe Varieties are (as I have formerly ſignified) to be attributed to the particular Poſition of thoſe parts, rather than to the *general* Hypotheſis. Of which this, in brief, may ſerve for ſome account at preſent. The *General* Hypotheſis of the Earths *diurnal* Motion from Weſt to Eaſt, would caſt *that* of the Waters, not following ſo faſt, from Eaſt to Weſt; which cauſeth the conſtant Current *within* the *Tropicks*, where the Circles are greateſt, weſt-ward from the Coaſt of

Africa

Africa to that of *America*, (which is alſo the Cauſe of the conſtant *Eaſtern Brize* blowing in thoſe parts.) But the Sea thus beating on the Coaſt of *America*, is caſt back as with an *Eddy* on either hand, and conſequently returns from the *American* ſhore Eaſt-ward towards the Coaſt of *Europe*; where, the Parallel Circles to the *Æquator* being leſs, and conſequently the *Diurnal* Motion ſlower, doth not caſt the waters ſo ſtrongly Weſt-wards, as between the *Tropicks*, and ſo not ſtrong enough to overcome the *Eddy*, which it meets with from the other Motion, which gives the Sea a North-Eaſterly Motion (on theſe Coaſts) as to its uſuall courſe. The Current therefore of our Seas being *North-Eaſterly*, we are next to conſider, at what times it runs more to the *North*, and at what more to the *Eaſt*. When it runs moſt *Northerly*, it runs up the *Iriſh* Sea, and ſo up the *Severn*: When moſt *Eaſterly*, it runs ſtreight up the *Channel*, and ſo to the Coaſt of *Kent*: When *between* theſe, it beats againſt *Devonſhire* and *Cornwall*, and thoſe parts. We are therefore to conſider (as to the *Annuall* periods) that the *Annuall* Motion of the *Earth* in the *Zodiack*, and the *Diurnal* in the *Æquator*, are not preciſely in the ſame direction, but make an *Angle* of $23\frac{1}{2}$ deg. at the *Æquinoxes*; but run, as it were, parallel at the *Solſtices*: And as they be nearer, or farther from theſe points, ſo is the Inclination varied. Which ſeveral directions of Motion, do cauſe the *Compound* Motion of both to vary from the *Eaſt* and *Weſt* more or leſs, according as the *Sun's* Poſition is farther or nearer the *Solſtices*. And therefore, *nearer* to the *Æquinoxes*, this Inclination doth caſt the Conſtant current of our Seas more to the *North* and *South*; and *further* from it, more to the *Eaſt* and *Weſt*. Which is the reaſon why the Current up the *Iriſh* Sea is nearer to the *Æquinoxes* (at the beginning of *March* and end of *September*) and up the Channel or Narrow Seas, farther from it (at the beginning of *February* and of *November*:) and againſt the Coaſts of *Devonſhire* and thereabout, at ſome intermediate time. And thus much I thought fit to ſignifie upon this occaſion. Dat. *Oxford* the 7. of *March An.* 166$\frac{7}{8}$.

Another Letter

Written by the ſame Hand, concerning ſome Miſtakes, to be found in a Book lately publiſh'd under the Title of SPECIMINA MATHEMATICA *Franciſci Du Laurens*, eſpecially touching a certain *Probleme*, affirm'd to have been propoſed by *Dr. Wallis*, to the Mathematicians of all *Europe*, to ſolve it.

ACcepi (V. C.) ante quatriduum, quem mihi miſiſti Franſiſci Du Laurens *Tractatum, cui titulus*, SPECIMINA MATHEMATICA, *&c. eumq; mox evolvi, quo Tibi poſsim (quod petis) quid de eo ſentiam, paucis oſtendere. Videtur autem plus fronte polliceri, quam opere abſolvit.* Prioris *libri pars magna, ex* Oughtredi *meiſque ſcriptis (utut neutrius ibi meminerit) videtur deſumpta, idque tam manifeſte, ut non modò peculiares loquendi formulas, ſed & ipſa ſymbola Notaſque paſsim retineat.* Poſterioris, *non parum ex* Vieta, Schotenio, *aliiſque ab eo editis (quorum & ſubinde meminit) deſumptum. Occurrunt inibi aliqua parum ſana, &, minime accurata multo plura. Quænam autem ſint illa* Genuina Principia, Veraque Geometriæ Elementa, hucuſque nondum tradita, *quæ Titulus pollicetur, non reperio : Longeque diverſimode Hic & Ego ſentimus, dum* pag. 141. Neminem eſſe, *opinatur*, qui hæc ſua non præferat ingenti Euclideorum Elementorum Multitudini.

In calce, manifeſtam mihi facit injuriam, ea de me affirmans, quæ verè utique non ſunt. Appendicem quippe ſubjungit, cui ſpecioſum hunc fecit Titulum, Solutio Problematis, à *D. Walliſio* totius *Europæ* Mathematicis propoſiti, ſed prius ad generale revocati, A. MDCLIII. eodem tempore, quo propoſitum erat.

Poſt Titulum, hæc ſequuntur. Problema D. Walliſii,

Datis Ellypſeos * maximis Diametris, tum puncto in tranſverſa ejus Diametro aſſignato, reperire in numeris ſegmenta lineæ intra Ellypſim terminatæ, & per datum punctum tranſeuntis, atque datum angulum cum dicta diametro facientis.

* *Pro*, Ellipſeos, *errore Typographi, ſine dubio*

Verum quia propoſitæ Quæſtionis ſolutio æque facilis eſt in numeris, ac in lineis (ut poſtea apparebit) melius facturum me judicavi, ſi prius demonſtrationem Analyticam hic afferrem, ex qua tum Numerica, tum Geometrica ſequeretur, ad problematis ſolutionem pertinens, effectio. Atque ut hæc ſolutio cum fænore detur, ſpeciale D. *Walliſii* problema ad generale ſic revoco.

(*Poſtque hanc* Præfationem Problema *ſequitur tanquam ſuis verbis expoſitum cum ſua ejuſdem ſolutione per ſeptem continuas paginas.*)

Ad quæ hæc dicenda nunc habeo.

1. *Totius* Europæ *Mathematicos. ob rem hujuſmodi, in arenam vocare, jactantiæ genus eſt, cujus ego hactenus reus non fui, (credo) nec futurus.*

2. *Si libuiſſet (oſtentandi gratia) ſic feciſſe, legiſſem certe quod vel majoris eſſet difficultatis, vel majoris momenti,* Problema, *quam hoc eſſe videtur,*

utpote

utpote quod mediocris Algebriſta, primo intuitu, ſemihoræ ſpacio facile ſolveret.

3. *Nec ſane hoc Problema, nec quod huic æquipollcat, unquam Ego (quod memini) ulli mortalium, nedum* totius Europæ Mathematicis, *propoſui, (neſcio an ulli unquam propoſiturus:) nec quicquam hujus, quod de me perſuaderi ſibi paſſus eſt, verum eſt.*

4. *Erat quidem aliquando Problema huic non prorſus abſimile* mihi *propoſitum (cujus & ſolutionem protinus expediebam) ſed* à me *propoſitum nemini, quod quatenus me ſpectare poſſit, videas in* Epiſtola *quadam mea, ad Nobiliſſ. Vice-Comitem* Brounker *data Maij* 11. 1658. *(quem annum innuit D.* Dulaurens) *eoque anno in meo* Commercio Epiſtolico p. 171. *typis vulgata, in hæc verba*;

Sub initium Februarii jam proxime elapſi, amicorum non-nemo, cui forte occurrebam ſero veſperi, quæſtionem ſequentem mihi porrexit in ſcriptis, quam jam nuperrime intelligo typis vulgatam eſſe cum hac Epigraphe; "Spectatiſſimos viros, Matheſeos Profeſſores, & alios præclaros in Anglia "Mathematicos, ut Problema ſolvere dignentur, *Jean de Montfort* maxi- "me deſiderat.

"Extremis Ellipſeos Diametris, diſtantiâ centri ab aliquo puncto in Axi "tranſverſo, ubi linea eundem ſecet ſub angulo dato, in numeris datis; "ſegmenta ejuſdem lineæ (ſi opus eſt) productæ,& intra transverſum Axem "& Ellipſin terminata, in numeris invenire.

Hanc Ego quæſtionem, ſuam ratus (neque enim vel innuebat Ille, vel Ego tum ſciſcitabar cujus erat,) paulo adhuc univerſalius expoſitam, ſub ea fere, quæ ſubeſt, forma (neque enim ipſiſſima verba memini) poſtero mane ſolvebam: Nec eram de illa ultra ſolicitus (quippe quæ nec magnæ videbatur difficultatis, nec momenti,) quam etiam, ut nunc audio, varii variis modis ſolvebant, ut ut eorum ſolutiones nondum viderim.

(Ac deinde ſequitur mea iſtius Problematis, *univerſalius adhuc propoſiti, ſolutio, cum annexa demonſtratione, brevis & perſpicua; ſaltem ſi excipias præli ſphalmata; quæ tamen qui hæc intelligit, facile reſtituet.)*

Atque hoc omne illud eſt, quod Ego de hoc Problemate *fecerim, quo id ullatenus ad me ſpectare videatur. Num autem hoc ſit (quod vult D.* Dulaurens) Problema illud totius Europæ Mathematicis, *a Me* propoſitum eſſe; *Ego cuilibet judicandum permitto, qui Latina intelligit, utcunque fuerit Matheſeos ignarus.*

Qui illud mihi monſtrabat Problema (ſcriptum primò, poſtea typis impreſſum) eſt Dr. Richardus Rawliſon. *Quis autem fuerit ille* Jean de Monfort *qui propoſuit, ignoro. Hujus autem impreſſa Chartula* Londini *tum temporis ſatis paſſim oſtabat, pluribuſque Matheſeos peritis propoſita, cum* Problema *exhibens ex* Gallia *delatum, quod & ex noſtris aliquot* Londini *ſolvebant: Quorum unus (Dr.* Chriſtoph. Wren, *tunc quidem in* Collegio Greſhamenſi Londini, *nunc,* Oxonii *Aſtronomiæ Profeſſor) ſolutionem ſuam typis editam publici juris fecit: ſimulque (in eadem chartâ) reſpoſuit* Problema *aliud, quod ipſe præſtantiſſimis in* Gallia *Mathematicis (uti illud inde nobis in* Anglia) *ſolvendum propoſuit, quod illorum nemo (quod ſciam) hactenus ſolutum dedit. Sua verò iſtius ſolutio exſtat in meo de* Cycloide *Tractatu. p.* 72. 73.

Cum itaque ſint hæc omnia (quod dicitur) publica & notoria, non poſſum non mirari, quo animo D. Dulaurens *palàm & in publicum ederet rem tam ab omni veritate alienam.*