to my darkned Chamber, to see those various Phænomena of Light made by divers Refractions and Reflexions, and took Notes upon them; which industry if they also had used, who endeavour to explicate the aforesaid Difference between the length and breadth of this coloured *Spectrum*, by the received Laws of Refraction, would never have taken so impossible a Task in hand.

The rest is, Honoured Sir, That it is far from my Intent, that the Mistake here mentioned, do any way derogate from that learned Person: Which truly might have happened to my self, if at my first tryal thereof, the Sun had been in a white Cloud, as it seems, it happened to him. Wherefore ceasing further to trouble you, I rest,

Yours to command, *Francis Linus.*

6 Octob. 1674.

Sir, *An Answer to this Letter.*

THE Letter you thought fit to write by way of Animadversion upon Mr. *Newton*'s new Theory of Light and Colours, grounded upon an Experiment of letting the Sun-beams through a little hole into a dark Chamber, seems to need no other Answer but this, That you would be pleased to look upon, and consider the Scheme in Mr. *Newton*'s 2d Answer to *P. Pardies*, in *Numb.* 85. of the *Ph. Transactions*; and rest assured, that the Experiment, as it is represented, was tried in clear Days, and the Prism placed close to the hole in the Window, so that the Light had no room to diverge, and the colour'd Image made not parallel (as in that conjecture) but transverse to the Axis of the Prism.

London, Decem. 17. 1674.

Extracts of two Letters, written by Mr. Flamsteed *to* Mr. Collins; *the* one *of* Novemb. 25. 1624, *concerning an Instrument to shew the Moon's true place to a minute or two; as also the Writer's design of correcting the hitherto assign'd Motions of the Sun: The* other, *of* Decemb. 14. 1674. *touching the necessity of making New Solar Numbers, together with an Expedient for making trial, whether the Refractions in Signor* Cassini's *Tables are just.*

The Extract of the first Letter.

AFter my return to *Derby*, I fell to peruse Mr. *Street*'s Discourse, and to consider the Contrivance of his *Moon-wiser*; which though he affirms in the Conclusion of his little Tract, to be different from Mr. *Horroxes*; yet I can assure, that for the *Motion* of *Longitude*, 'tis the very same, and no other than what is taken from my Explication, save that, where I thought the manner of Librating the *Apogéum* was obvious from the Calculation, and needed not to be ex-

plained, he hath ſhewn, how to take it in the Libratory Circle. As for his *Motion* of *Latitude*, indeed that is a little different; but I can again aſſure him, not much better than Mr. *Horroxes*; to whom we are indebted for this Contrivance. Mean time, when he hath done what he can, it will not ſhew the true place to half a Degree.

I have therefore thought of another Contrivance, not ſo large, nor troubleſome as his, that ſhall ſhew the Moon's true place to a Minute or two without Error, and with an Inſtrument, no larger than his, to leſs than a ſingle Minute.

And becauſe I find by correcting the Sun's Motions by Signor *Caſſini*'s Obſervations, that his Inequalities are 5 Minutes leſs in his *mean* diſtance; and that the motion of Latitude needs correction; I ſhall amend both, as I think and find it, in this Inſtrument; which, with the Place and Latitudes, will give the Moon's Semi-diameters and Parallaxes to a ſecond.

The Extract of the other *Letter.*

I Think, I have been ſince my laſt a little better employed than before, I found it neceſſary, to make new *Solar* Numbers, becauſe in my old I had neglected to apply *Refractions* in all the Altitudes above 30 Degrees; wherein yet Reaſon and ſome little Experience hath ſhew'd me, *they* are not inſenſible. I found Signor *Caſſini*'s Obſervations, which I took from *Ricciolus* his *Aſtronomia reformata*, much more accurate than *Tycho*'s, and therefore ſought out Numbers that might anſwer them. The *Apogæum* I found it neceſſary to promote 44 Minutes; ſo that *Anno incunte* 1655. it might be in ♋ 7*h*. 30*m*. or. and to make the greateſt Equation only 1*h*. 54*m*. 13 *s*. whereby I found, the *Phænomena* would be anſwer'd much more accurately than I expected, and as near, all things conſider'd, as I could deſire.

But ſtill I was uncertain, whether the Refractions in the ſaid *Caſſini*'s Tables, were juſt Meaſures or not; and I had no Conveniencies for making Trial. At laſt, I thought on this Expedient, which fully ſatisfied me, *viz.*

I conſider'd, That if ſome of thoſe Obſervations of the Diſtances of ☿ from the ☉ by Day, the Stars in the Night preceeding or following, were skilfully examin'd; they might ſhew me the true Quantity of the Equations of the Sun's Orb, or rather the Difference of his mean and equal Motion. I turn'd over his *Progymnaſmata*, and pitched on two. The *firſt* made *A*. 1585. the 5th of *March*, hor. 4. 42 *m*. and hor. 7. 12 *m*. p. m; whereby I found, the ☉ at hor. 4. 42*m*. was 94. 47*m*. in antecedence of the *Lucida calcis* ♊. The *ſecond* made *A*. 1585, the 15th. *Sept*. hor. 5. 15*m*. and hor. 6. 55. *manè*.

Where-

Where-from (applying and conſidering the Refractions in both,) I found the Sun at hor. 6. 55′ to be 74°. 30′. in conſequence of the lower Head of ♊. The difference of Longitude betwixt theſe two Stars, is 17°. 59′: And therefore now the Sun in conſequence of the *Lucida calcis* ♊ 92°. 29′. So that the Sun's *Apparent* motion betwixt the Year 1582, the 5th of *March* at hor. 4. 42′. and the year 1585, the 15th of *Septemb.* at hor. 6. 55′. *manè* (beſides the whole revolutions) was 187°. 16′: But the *Mean* Motion is 191°, 2′; greater than the *Apparent* by 3°. 46′: Which, parted in proportion to the Equation of the Earth's Motion, collected for thoſe Times from my New Tables, gives the greateſt Equation of the Orb, 1°. 54′. 15″; conſenting, to my wonder, (without any wreſting of the Obſervations) with that, which I deduced from *Caſſini*'s correct Meridional Altitudes.

I had not had time to examine any of thoſe others, he hath related; nor indeed are they any ways convenient: But by this what I have done you may ſee, that if once we get Inſtruments to our purpoſe, that then it will not be difficult to correct the *Sun*'s *Motions* without the conſideration of the Meridional Altitudes, in which 24 Seconds error, gives the Place above one Minute amiſs.

At preſent I uſe Tables, for the Sun's Motion, grounded on this Equation, which is leſs than *Tycho*'s by no leſs than 9 Minutes: Which muſt needs cauſe great Alterations in our Numbers for all the other Planets; in correcting of which, I ſhall employ ſome of thoſe Minutes I can ſpare from my more neceſſary Studies; and have hopes of good Succeſs.

Tycho's great Equation made him commit no ſmall Errors, and put him upon ſtrange ſhifts to hide and ſalve them. All his Obſervations of the Planets in their Oppoſitions to the Sun, are to be corrected, before we may attempt to repreſent them by Numbers: For, his Errors in the Sun's place made him err ſometimes 5 or 6 hours in the time of the Oppoſition; which muſt be reformed.

And that I may perform my Diſcourſe of the Parallax of *Mars* obſerv'd, I ſhall fall upon it at my ſpare hours after *Chriſtmas*.

Some Obſervations and Experiments made, and in a Letter communicated to the Publiſher, for the R. Society, *by the Learned and Inquiſitive Mr.* Martin Liſter.

I Shall venture to entertain you at preſent with a few looſe Notes, which you will be pleas'd to take in good part, and diſpoſe of them as you think fitting.

1. *Of the Efflorеſcence of certain Mineral Glebes.*

I keep by me certain big pieces of crude Allom-Mines, ſuch as it

was