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DISCOVERY OF A WORLD IN THE MOONE

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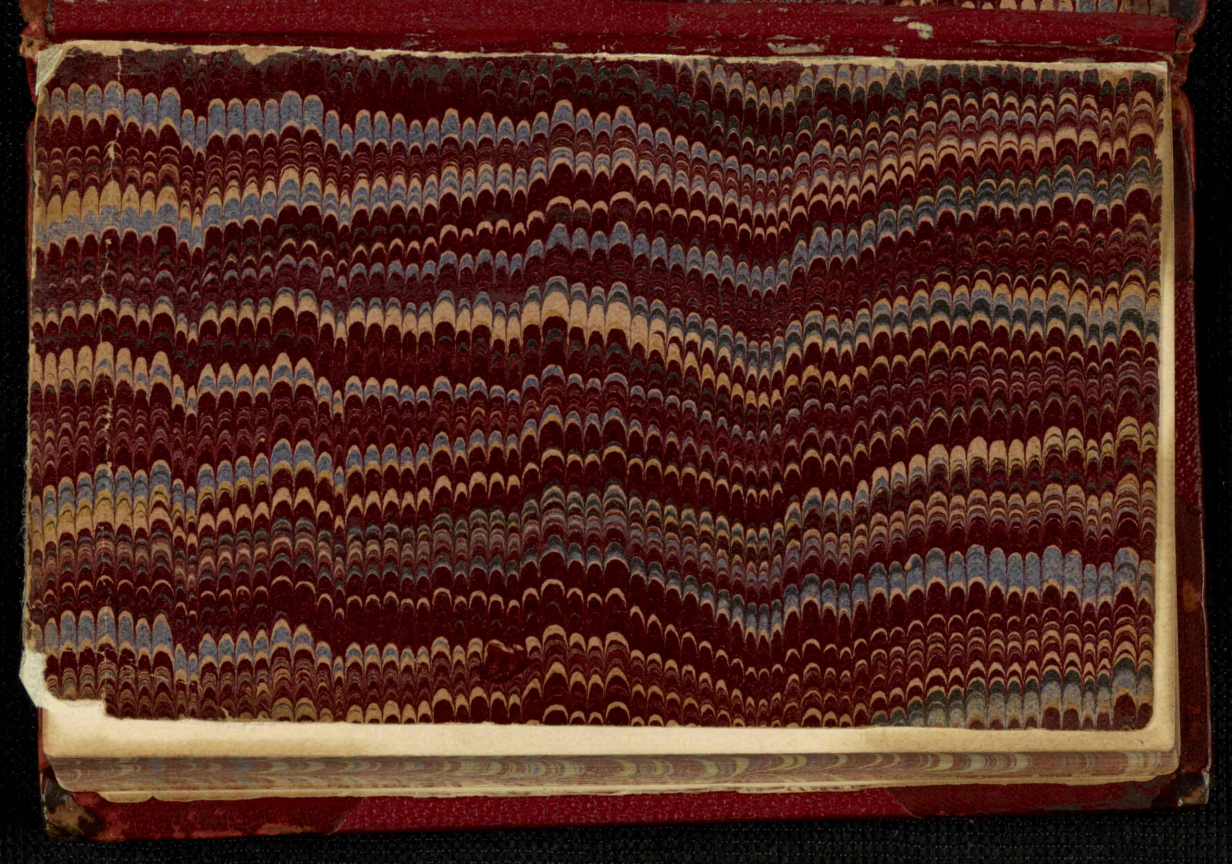

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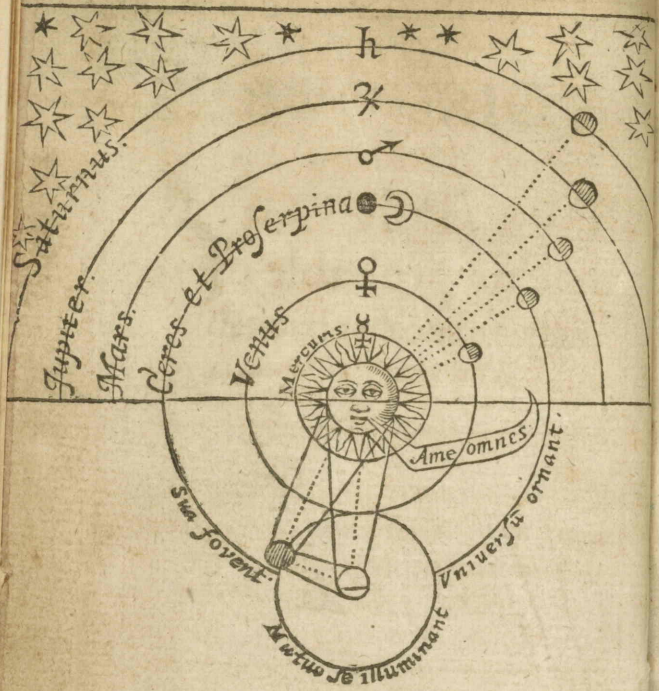

THE DISCOVERY OF A WORLD IN THE MOONE.

OR,

A DISCOVRSE

Tending

TO PROVE,

that 'tis probable there may be another habitable World in that Planet.

Quid tibi inquis ista proderunt? Si nihil aliud, hoc certè, sciam omnia angusta esse. SENECA. Præf. ad 1. Lib. N. 2.

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Perlegi hæc παράδοξα & novitatis gratiâ typis mandari permitto.

Mart. 29. 1638.
THO. WEEKES *R. P.*
Episc. Lond. Cap.
Domest.

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To the Reader.

IF amongst thy leisure houres thou canst spare any for the perusall of this discourse, and dost looke to finde somewhat in it which may serve for thy information and benefit: let me then advise thee to come unto it with an equall minde, not swayed by prejudice, but indifferently resolved to assent unto that truth which upon deliberation shall seeme most probable unto thy reason, and then I doubt not, but either thou wilt agree with me in this assertion, or at least not thinke it to be as farre from truth, as it is from common opinion.

Two cautions there are which I would willingly admonish thee of in the beginning.

1. *That thou shouldst not here looke to find any exact, accurate Treatise, since this discourse was but the fruit of some lighter studies, and those too hudled up in a short time, being first thought of and finished in the space of some few weekes, and therefore you cannot in reason expect, that it should be so polished, as perhaps, the subject would require, or the leisure of the Author might have done it.*

2. *To remember that I promise onely probable arguments for the proofe of this opinion, and therefore you must not looke that every consequence should be of an undeniable dependance, or that the truth of each argument should be measured by its necessity. I grant that some Astronomicall appearances may possibly be solved otherwise then here they are. But the thing I aime at is this, that probably they may so be solved, as I have here set them downe: Which, if it be granted (as I thinke it must) then I*

doubt

doubt not, but the indifferent reader will find some satisfaction in the maine thing that is to be proved.

Many ancient Philosophers of the better note, have formerly defended this assertion, which I have here laid downe, and it were to be wished, that some of us would more apply our endeavours unto the examination of these old opinions, which though they have for a long time lien neglected by others, yet in them may you finde many truths well worthy your paines and observation. Tis a false conceit, for us to thinke, that amongst the ancient variety and search of opinions, the best hath still prevailed. Time (saith the learned Verulam) seemes to be of the nature of a river or streame, which carrieth downe to us that which is light, or blowne up, but sinketh that which is weighty and solid.

It is my desire that by the occasion of this discourse, I may raise up some more active spirit to a search

after

after other hidden and unknowne truthes. Since it must needes be a great impediment unto the growth of sciences, for men still so to plod on upon beaten principles, as to be afraid of entertaining any thing that may seeme to contradict them. An unwillingnesse to take such things into examination, is one of those errours of learning in these times observed by the judicious Verulam. *Questionlesse there are many secret truths, which the ancients have passed over, that are yet left to make some of our age famous for their discovery.*

If by this occasion I may provoke any reader to an attempt of this nature, I shall then thinke my selfe happy, and this worke successfull.

Farewell.

The First Proposition, by way of Preface.

That the strangenesse of this opinion is no sufficient reason why it should be rejected, because other certaine truths have beene formerly esteemed ridiculous, and great absurdities entertayned by common consent.

THere is an earnestnesse and hungering after novelty, which doth still adhere unto all our natures, and it is part of that primative image, that wide extent and infinite capacity at first created in the heart of man, for this since its depravation in

Adam perceiving it selfe altogether emptied of any good doth now catch after every new thing, conceiving that possibly it may finde satisfaction among some of its fellow creatures. But our enemy the divell (who strives still to pervert our gifts, and beate us with our owne weapons) hath so contriv'd it, that any truth doth now seeme distastefull for that very reason, for which errour is entertain'd-- Novelty, for let but some upstart heresie be set abroach, and presently there are some out of a curious humour; others, as if they watched an occasion of singularity, will take it up for canonicall, and make it part of their creede and profession;- whereas solitary truth cannot any where finde so ready entertainement; but the same Novelty which is esteemed the commendation of errour and makes that acceptable, is counted the fault of

of truth, and cauſes that to bee rejected. How did the incredulous World gaze at *Columbus* when hee promiſed to diſcover another part of the earth, and he could not for a long time by his confidence, or arguments, induce any of the Chriſtian Princes, either to aſſent unto his opinion, or goe to the charges of an experiment. Now if he who had ſuch good grounds for his aſſertion, could finde no better entertainement among the wiſer ſort, and upper end of the World; 'tis not likely then that this opinion which I now deliver, ſhall receive any thing from the men of theſe daies, eſpecially our vulgar wits, but misbelieſe or deriſion. It hath alwaies beene the unhappineſſe of new truths in Philoſophy, to be derided by thoſe that are ignorant of the cauſes of things, and reiected by others whoſe perverſeneſſe ties them to the con-

trary opinion, men whose envious pride will not allow any new thing for truth which they themselves were not the first inventors of. So that I may iustly expect to be accused of a pragmaticall ignorance, and bold ostentation, especially since for this opinion *Xenophanes*, a man whose authority was able to adde some credit to his assertion could not escape the like censure from others. For *Natales Comes* speaking of that Philosopher, and this his opinion, saith thus, *Nonnulli ne nihil scisse videantur, aliqua nova monstra in Philosophiã introducunt, ut alicujus rei inventores fuisse appareant.* Some "there are who least they might "seeme to know nothing, will "bring up monstrous absurdi-"ties in Philosophy, that so af-"terward they may bee famed "for the invention of somewhat. The same author doth also in another place accuse *Anaxagoras* of

Mytholog. lib. 3. c. 17.

Lib. 7. c. 1.

of folly for the ſame opinion, *Eſt enim non ignobilis gradus ſtultitiæ, vel ſi neſciæs quid dicas, tamen velle de rebus propoſitis hanc vel illam partem ſtabilire.* "'Tis none of the worſt kindes of folly, boldly to affirme one ſide or other, when a man knows not what to ſay.

If theſe men were thus cenſur'd, I may iuſtly then expect to be derided by moſt, and to be believed by few or none; eſpecially ſince this opinion ſeemes to carry in it ſo much ſtrangeneſſe, ſo much contradiction to the generall conſent of others. But how ever, I am reſolved that this ſhall not be any diſcouragement, ſince I know that it is not the common opinion of others that can either adde or detract from the truth. For,

1. Other truths have beene formerly eſteemed altogether as ridiculous as this can be.

2 Grosse absurdities have beene entertained by generall opinion.

I shall give an instance of each, that so I may the better prepare the Reader to consider things without a prejudice, when hee shall see that the common opposition against this which I affirme cannot any way derogate from its truth.

1. Other truths have beene formerly accounted as ridiculous as this, I shall specifie that of the Antipodes, which have beene denied and laught at by many wise men and great Schollers, such as were *Herodotus*, St. *Austin*, *Lactantius*, the *Venerable Bede*, *Lucretius* the Poet, *Procopius*, and the voluminous *Abulensis* with others. *Herodotus* counted it so horrible an absurdity, that hee could not forbeare laughing to thinke of it. Γελῶ δὲ ὁρῶν γῆς περιόδους γεγράφαντας, πολλὰς

ἤδη

ἤδη καὶ ἀδένα νόον ἔχοντας ἐξηγησάμενον οἱ Ὠκεανόν τε ῥέοντα γράφουσι, πέριξ τοῦ τε γῆς ἐόντα κυκλοτερέα ὡς ἀπὸ τόρνου.

"I cannot choose but laugh, "(saith he) to see so many men "venture to describe the earths "compasse, relating those things "that are without all sense, as "that the Sea flowes about the "World, and that the earth it "selfe is round as an Orbe. But this great ignorance is not so much to be admired in him, as in those learneder men of later times, when all sciences began to flourish in the World. Such was Saint *Austin* who censures that relation of the Antipodes to be an incredible fable, and with him agrees the eloquent *Lactantius*, *quid illi qui esse contrarios vestigiis nostris Antipodes putant? num aliquid loquuntur? aut est quispiam tam ineptus, qui credat esse homines, quorum vestigia sunt superiora quàm capita? aut ibi quæ apud nos jacent inver-*

De civit. Dei. lib. 16. cap. 9.

Institut. l. 3. c. 24.

sapendere? fruges & arbores deorsum versus crescere, pluvias & nives, & grandinem sursum versus cadere in terram? & miratur aliquis hortos pensiles inter septem mira narrari, quum Philosophi, & agros & maria, & urbes & montes pensiles faciunt? &c. What (saith "he) are they that thinke there "are Antipodes, such as walke "with their feet against ours? "doe they speake any likely-"hood? or is there any one so "foolish as to believe that there "are men whose heeles are high-"er than their heads? that "things which with us doe lie "on the ground doe hang there? "that the Plants and Trees "grow downewards, that the "haile, and raine, and snow fall "upwards to the earth? and "doe wee admire the hanging "Orchards amongst the seven "wonders, whereas here the "Philosophers have made the "Field and Seas, the Cities and Moun-

"Mountaines hanging. What "ſhall wee thinke (ſaith hee in *Plutarch*) that men doe clyng to that place like wormes, or hang by their clawes as Cats, or if wee ſuppoſe a man a little beyond the Center, to bee digging with a ſpade? is it likely (as it muſt bee according to this opinion) that the earth which hee looſened, ſhould of it ſelfe aſcend upwards? or elſe ſuppoſe two men with their middles about the center, the feete of the one being placed where the head of the other is, and ſo two other men croſſe them, yet all theſe men thus ſituated according to this opinion ſhould ſtand upright, and many other ſuch groſſe conſequences would follow (ſaith hee) which a falſe imagination is not able to fancy as poſſible. Upon which conſiderations, *Bede* alſo denies the being of any Antipodes, *Neq; enim Antipodarum*

De ratione temporum, Cap. 32.

rum nullatenus est Fabulis accommodandus assensus, Nor should wee "any longer assent to the Fable "of Antipodes. So also *Lucretius* the Poet speaking of the same subject, sayes:

De nat. rerum, lib. 1. *Sed vanus stolidis hæc omnia finxerit error.*

That some idle fancy faigned these for fooles to believe. Of this opinion was *Procopius Gazæus*, but he was perswaded to it by another kinde of reason; for he thought that all the earth under us was sunke in the water, according to the saying of the Psalmist, Hee hath founded the Earth upon the Seas, and therefore hee accounted it not inhabited by any. Nay *Tostatus* a man of later yeeres and generall learning doth also confidently deny that there are any such Antipodes, though the reason which hee urges for it bee not so absurde as the former, for the Apostles, saith hee, travelled through the whole habi-

Comment. in 1. Cap. Gen.

Psal. 24. 2.

Comment. in 1. Genes.

habitable world, but they never passed the Equinoctiall; and if you answer that they are said to goe through all the earth, because they went through all the knowne world, hee replies, that this is not sufficient, since Christ would have all men to be saved, and come to the knowledge of his truth, and therefore 'tis requisite that they should have travelled thither also, if there had been any inhabitants, especially since he did expressely command them to goe and teach all nations, and preach the Gospell through the whole world, and therefore he thinkes that as there are no men, so neither are there seas, or rivers, or any other conveniency for habitation: 'tis commonly related of one *Virgilius*, that he was excommunicated and condemned for a Heretique by *Zachary* Bishop of *Rome*, because hee was not of the same opinion. But

1 Tim. 2. 4.

Mat. 28. 19

Baronius

Annal. Eccles. A. D. 748.

Baronius saies, it was because hee thought there was another habitable world within ours. However, you may well enough discerne in these examples how confident many of these great Schollars were in so grosse an errour, how unlikely, what an incredible thing it seemed to them, that there should be any Antipodes, and yet now this truth is as certaine and plaine, as sense or demonstration can make it. This then which I now deliver is not to be rejected, though it may seeme to contradict the common opinion.

2. Grosse absurdities have beene entertained by generall consent. I might instance in many remarkeable examples, but I will onely speake of the supposed labour of the Moone in her eclipses, because this is neerest to the chiefe matter in hand, and was received as a common opinion amongst many

ny of the ancients, and therefore *Plutarch* ſpeaking of a Lunary eclipſe, relates, that at ſuch times 'twas a cuſtome amongſt the *Romanes* (the moſt civill and learned people in the world) to ſound braſſe Inſtruments, and hold great torches toward the heaven. Τῶν δ' Ρωμαίων (ὥσπερ ὄζιν ἐνομισμένον) χαλκῶ τε πατάγοις ἀναστενομένων τὸφῶς σώιτᾶς καὶ πυρὰ πολλὰ δαλοῖς καὶ δαδὶν ἀνεχόντων πρὸς τὸν οὐρανόν. *In vita Paul. Æmil.*

for by this meanes they ſuppoſed the Moone was much eaſed in her labours, and therfore *Ovid* calls ſuch loud Inſtruments the auxiliaries or helpes of the Moone.

Cum frustra resonant æra auxiliaria Lunæ. *Metam. l. 4.*

and therefore the Satyriſt too deſcribing a loud ſcold, ſaies, ſhe was able to make noiſe enough to deliver the labouring Moone.

Vna laboranti poterit succurrere Lunæ. *Iuven. Sat. 6*

Now the reaſon of all this their ceremonie, was, becauſe they feared the world would fall

asleepe,

asleepe, when one of its eyes began to winke, and therefore they would doe what they could by loud sounds to rouse it from its drowsinesse, and keepe it awake by bright torches, to bestow that light upon it which it began to lose. Some of them thought hereby to keepe the Moone in her orbe, whereas otherwise she would have fallen downe upon the earth, and the world would have lost one of its lights, for the credulous people believed, that Inchanters, and Witches could bring the Moone downe, which made *Virgil* say,

Cantus & è cœlo possunt deducere Lunam.

And those Wizards knowing the times of her eclipses, would then threaten to shew their skill, by pulling her out of her orbe. So that when the silly multitude saw that she began to looke red, they presently feared they should lose the benefit of her light, and therefore made a great noise that

she

ſhe might not heare the ſound of thoſe Charmes, which would otherwiſe bring her downe, and this is rendered for a reaſon of this cuſtome by *Pliny* and *Propertius:*

Cantus & è curru lunam deducere tentant,
Et facerent, ſi non æra repulſa ſonent.

Nat. hiſt. lib.2. c.12.

Plutarch gives another reaſon of it, and he ſayes, 'tis becauſe they would haſten the Moone out of the darke ſhade wherein ſhee was involv'd, that ſo ſhe might bring away the ſoules of thoſe Saints that inhabit within her, which cry out by reaſon they are then deprived of their wonted happineſſe, and cannot heare the muſicke of the Spheares, but are forced to behold the torments, and wailing of thoſe damned ſoules which are repreſented to them as they are tortured in the region of the aire, but whether this or what ever elſe was the meaning of this ſuperſtition, yet certainly 'twas a very ridiculous cuſtome,

stome, and bewrayed a great ignorance of those ancient times, especially since it was not onely received by the vulgar, such as were men of lesse note and learning, but believed also, by the more famous and wiser sort, such as were those great Poets, *Stesichorus* and *Pindar*. And not onely amongst the more sottish heathens, who might account that Planet to be one of their Gods, but the primitive Christians also were in this kinde guilty; which made S. *Ambrose* so tartly to rebuke those of his time, when he said, *Tum turbatur carminibus Globus Lunæ, quando calicibus turbantur & oculi.* When "your heads are troubled with "cups, then you thinke the "Moone to be troubled with "charmes.

Turinens. Episc. And for this reason also did *Maximus* a Bishop, write a Homily against it, wherein hee shewed the absurditie of that foolish

foolish superstition. I remember, that *Ludovicus Vives* relates a more ridiculous story of a people that imprisoned an Asse for drinking up the Moone, whose image appearing in the water was covered with a cloud, as the Asse was drinking, for which the poore beast was afterward brought to the barre to receive a sentence according to his deserts, where the grave Senate being set to examine the matter, one of the Counsell (perhaps wiser than the rest) rises up, and out of his deepe judgement, thinkes it not fit that their Towne should lose its Moone, but that rather the Asse should be cut up, and that taken out of him, which sentence being approved by the rest of those Politicians, as the subtillest way for the conclusion of the matter was accordingly performed. But whether this tale were true or no I will not question, how-

ever there is absurdity enough in that former custome of the ancients, that may confirme the truth to be proved, and plainly declare the insufficiency of common opinion to adde true worth or estimation unto any thing. So that from that which I have said may be gathered thus much.

1. That a new truth may seeme absurd and impossible not onely to the vulgar, but to those also who are otherwise wise men, and excellent schollers; and hence it will follow, that every new thing which seemes to oppose common Principles is not presently to be rejected, but rather to be pry'd into with a diligent enquiry, since there are many things which are yet hid from us, and reserv'd for future discovery.
2. That it is not the commonnesse of an opinion that can priviledge it for a truth, the wrong

wrong way is ſometime a well beaten path, whereas the right way (eſpecially to hidden truths) may bee leſſe trodden and more obſcure.

True indeed, the ſtrangeneſſe of this opinion will detract much from its credit; but yet we ſhould know that nothing is in its ſelfe ſtrange, ſince every naturall effect has an equall dependance upon its cauſe, and with the like neceſſity doth follow from it, ſo that 'tis our ignorance which makes things appeare ſo, and hence it comes to paſſe that many more evident truths ſeeme incredible to ſuch who know not the cauſes of things: you may as ſoone perſwade ſome Country peaſants that the Moone is made of greene Cheeſe (as wee ſay) as that 'tis bigger than his Cart-wheele, ſince both ſeeme equally to contradict his ſight, and hee has not reaſon enough to leade him farther than

his ſenſes. Nay, ſuppoſe (ſaith *Plutarch*) a Philoſopher ſhould be educated in ſuch a ſecret place, where hee might not ſee either Sea or River, and afterwards ſhould be brought out where one might ſhew him the great Ocean telling him the quality of that water, that it is blackiſh, ſalt, and not potable, and yet there were many vaſt creatures of all formes living in it, which make uſe of the water as wee doe of the aire, queſtionleſſe he would laugh at all this, as being monſtrous lies & fables, without any colour of truth. Juſt ſo will this truth which I now deliver appeare unto others; becauſe we never dreamt of any ſuch matter as a world in the Moone, becauſe the ſtate of that place hath as yet been vailed from our knowledge, therefore wee can ſcarcely aſſent to any ſuch matter. Things are very hardly received which are altogether

ſtrange

ſtrange to our thoughts and our ſenſes. The ſoule may with leſſe difficulty be brought to believe any abſurdity, when as it has formerly beene acquainted with ſome colours and probabilities for it, but when a new, and an unheard of truth ſhall come before it, though it have good grounds and reaſons, yet the underſtanding is afraid of it as a ſtranger, and dares not admit it into its beliefe without a great deale of reluctancy and tryall. And beſides things that are not manifeſted to the ſenſes, are not aſſented unto without ſome labour of mind, ſome travaile and diſcourſe of the underſtanding, and many lazie ſoules had rather quietly repoſe themſelves in an eaſie errour, then take paines to ſearch out the truth. The ſtrangeneſſe then of this opinion which I now deliver will be a great hinderance to its beliefe, but this is not to be re-

ſpected by reaſon it cannot bee helped. I have ſtood the longer in the Preface, becauſe that prejudice which the meere title of the booke may beget cannot eaſily be removed without a great deale of preparation, and I could not tell otherwiſe how to rectifie the thoughts of the Reader for an impartiall ſurvey of the following diſcourſe.

I muſt needs confeſſe, though I had often thought with my ſelfe that it was poſſible there might be a world in the Moone, yet it ſeemed ſuch an uncouth opinion that I never durſt diſcover it, for feare of being counted ſingular and ridiculous, but afterward having read *Plutarch*, *Galilæus*, *Keplar*, with ſome others, and finding many of mine owne thoughts confirmed by ſuch ſtrong authority, I then concluded that it was not onely poſſible there might bee, but probable that there was another habi-

habitable world in that Planet. In the prosecuting of this assertion, I shall first endeavour to cleare the way from such doubts as may hinder the speed or ease of farther progresse; and because the suppositions imply'd in this opinion may seeme to contradict the principles of reason or faith, it will be requisite that I first remove this scruple, shewing the conformity of them to both these, and proving those truths that may make way for the rest, which I shall labour to performe in the second, third, fourth, and fifth Chapters, and then proceede to confirme such Propositions, which doe more directly belong to the maine point in hand.

Proposition 2.

That a plurality of worlds doth not contradict any principle of reason or faith.

TIs reported of *Aristotle* that when hee saw the bookes of *Moses* he commended them for such a majesticke stile as might become a God, but withall hee censured that manner of writing to be very unfitting for a Philosopher because there was nothing proved in them, but matters were delivered as if they would rather command than perswade beliefe. And 'tis observed that hee sets downe nothing himselfe, but he confirmes it by the strongest reasons that may be found, there being scarce an argument of force for any subject in Philosophy which may not bee picked out of his

his writings, and therefore 'tis likely if there were in reason a necessity of one onely world, that hee would have found out some such necessary proofe as might confirme it: Especially since hee labours for it so much in two whole Chapters. But now all the arguments which he himselfe urges in this subject, are very weake and farre enough from having in them any convincing power. Therefore 'tis likely that a plurality of worlds doth not contradict any principle of reason. However, I will set downe the two chiefe of his arguments from his owne workes, and from them you may guesse the force of the other. The 1 is this, since every heavy body doth naturally tend downwards, and every light body upwards, what a hudling and confusion must there bee if there were two places for gravity and two places for lightnesse: for it is

De Cœlo l 1. c. 8. 9.

Ibid.

is probable that the Earth of that other World would fall downe to this Center, and so mutually the aire and fire here ascend to those Regions in the other, which must needes much derogate from the providence of nature, and cause a great disorder in his workes. To this I answere, that if you will consider the nature of gravity, you will plainely see there is no ground to feare any such confusion, for heavinesse is nothing else but such a quality as causes a propension in 'its subject to tend downewards towards its owne Centre, so that for some of that earth to come hither would not bee said a fall but an ascension, since it moved from its owne place, and this would bee impossible (saith *Ruvio*) because against nature, and therefore no more to bee feared than the falling of the Heavens.

De Celo L1.c.9.q.1.

Another

Another Argument hee had from his master *Plato*, that there is but one World, because there is but one first mover, God.

Metaphys. l. 12. c. 8. Diog. Laert. lib. 3.

But here I may deny the consequence, since a plurality of worlds doth not take away the unity of the first mover. *Vt enim forma substantialis, sic primum efficiens apparentem solummodo multiplicitatem induit per signatam materiam* (saith a Countreyman of ours.) As the substantiall forme, so the efficient cause hath onely an appearing multiplicity from its particular matter. You may see this point more largely handled, and these Arguments more fully answered by *Plutarch* in his Booke (why Oracles are silent) and *Iacob Carpentarius* in his comment on *Alcinous*.

Nic. Hill. de Philosop. Epic. partic. 379.

But our opposites the Interpreters themselves, (who too often doe *jurare in verba magistri*) will grant that there is not any strength

ſtrength in theſe conſequences, and certainely their ſuch weake arguments could not convince that wiſe Philoſopher, who in his other opinions was wont to bee ſwayed by the ſtrength and power of reaſon: wherefore I ſhould rather thinke that he had ſome by-reſpect, which made him firſt aſſent to this opinion, and afterwards ſtrive to prove it. Perhaps it was becauſe hee feared to diſpleaſe his ſcholler *Alexander*, of whom 'tis related that he wept to heare a diſputation of another world, ſince he had not then attained the Monarchy of this, his reſtleſſe wide heart would have eſteemed this Globe of Earth not big enough for him, if there had beene another, which made the Satyriſt ſay of him,

Plutarch. de t'anq. anim.

Æſtuat infœlix anguſto limite mundi.

Juvenal.

"That he did vexe himſelfe and "ſweate in his deſires, as being "pend up in a narrow roome, when

"when hee was confin'd but to "one world. Before he thought to ſeate himſelfe next the Gods, but now when hee had done his beſt, hee muſt be content with ſome equall, or perhaps ſuperiour Kings.

It may be, that *Ariſtotle* was moved to this opinion, that hee might thereby take from *Alexander* the occaſion of this feare and diſcontent, or elſe, perhaps, *Ariſtotle* himſelfe was as loth to hold the poſſibility of a world which he could not diſcover, as *Alexander* was to heare of one which he could not conquer. Tis likely that ſome ſuch by-reſpect moved him to this opinion, ſince the arguments he urges for it are confeſt by his zealous followers and commentators, to be very ſleight and frivolous, and they themſelves grant, what I am now to prove, that there is not any evidence in the light of naturall reaſon, which can ſufficiently

ently manifest that there is but one world.

But however some may object, would it not be inconvenient and dangerous to admit of such opinions that doe destroy those principles of *Aristotle*, which all the world hath so long followed?

Apologia pro Galileo.

This question is much controverted by the *Romish* Divines; *Campanella* hath writ a Treatise in defence of it, in whom you may see many things worth the reading and notice.

Ethic. l. 1. c. 6.

To it I answer, that this position in Philosophy, doth not bring any inconvenience to the rest, since tis not *Aristotle*, but truth that should be the rule of our opinions, and if they be not both found together, wee may say to him, as hee said to his Master *Plato*, ἀμφοῖν γὰρ ὄντοιν φίλοιν, ὅσιον προτιμᾶν τὴν ἀλήθειαν. Though "*Plato* were his friend, yet hee "would rather adhere to truth than him.

I muſt needs grant, that wee are all much beholden to the induſtry of the ancient Philoſophers, and more eſpecially to *Ariſtotle*, for the greater part of our learning, but yet tis not ingratitude to ſpeake againſt him, when hee oppoſeth truth; for then many of the Fathers would be very guilty, eſpecially *Iuſtin*, who hath writ a Treatiſe purpoſely againſt him.

But ſuppoſe this opinion were falſe, yet 'tis not againſt the faith, and ſo it may ſerve for the better confirmation of that which is true; the ſparkes of errour, being forc'd out by oppoſition, as the ſparkes of fire, by the ſtriking of the flint and ſteele. But ſuppoſe too that it were hereticall, and againſt the faith, yet may it be admitted with the ſame priviledge as *Ariſtotle*, from whom many more dangerous opinions have proceeded: as that the world is eternall,

eternall, that God cannot have while to looke after these inferiour things, that after death there is no reward or punishment, and such like blasphemies, which strike directly at the fundamentalls of our Religion.

So that it is justly to be wondred why some should be so superstitious in these daies, as to sticke closer unto him, than unto Scripture, as if his Philosophy were the onely foundation of all divine truths.

Upon these grounds both St. *Vincentius* and *Senasinus de firmo* (as I have seene them quoted) thinke that *Aristotle* was the viol of Gods wrath, which was powred out upon the waters of Wisedome by the third Angel; But for my part, I thinke the world is much beholden to *Aristotle* for all it sciences. But yet twere a shame for these later ages to rest our selves meerely upon the labours of our Fore-fathers,

Rev. 16. 4.

as

as if they had informed us of all things to be knowne, and when wee are ſet upon their ſhoulders, not to ſee further then they themſelves did. 'Twere a ſuperſtitious, a lazie opinion to thinke *Ariſtotles* workes the bounds and limits of all humane invention, beyond which there could be no poſſibility of reaching. Certainly there are yet many things left to diſcovery, and it cannot be any inconvenience for us, to maintaine a new truth, or rectifie an ancient errour.

But the poſition ſay ſome) is directly againſt Scripture, for

1. *Moſes* tells us but of one world, and his Hiſtory of the creation had beene very imperfect if God had made another.

2. Saint *John* ſpeaking of Gods workes, ſaies he made the world, in the ſingular number, and therefore there is but one: 'tis the argument of *Aquinas*, and he thinks that none will oppoſe it, but ſuch

Part 1. Q. 47. Art. 3.

who with *Democritus* esteeme some blinde chance, and not any wise providence to be the framer of all things.

3. The opinion of more worlds has in ancient time beene accounted a heresie, and *Baronius* affirmes that for this very reason, *Virgilius* was cast out of his Bishopricke, and excommunicated from the Church.

Annal. Eccl. A. D. 748.

4. A fourth argument there is urged by *Aquinas*, if there be more words than one, then they must either be of the same, or of a diverse nature, but they are not of the same kinde, for this were needlesse, and would argue an improvidence, since one would have no more perfection than the other; not of divers kinds, for then one of them could not be called the world or universe, since it did not containe universall perfection, I have cited this argument, because it is so much stood upon by *Iulius Cæsar la Galla*, one that has purposely

Ibid.

De Phænom in orbe lunæ.

poſely writ a Treatiſe againſt this opinion which I now deliver, but the Dilemma is ſo blunt, that it cannot cut on either ſide, and the conſequences ſo weake, that I dare truſt them without an anſwer; And (by the way) you may ſee this Author in that place, where he endeavours to prove a neceſſity of one world, doth leave the chiefe matter in hand, and take much needleſſe paines to diſpute againſt *Democritus*, who thought that the world was made by the caſuall concourſe of *atoms* in a great *vacuum*. It ſhould ſeeme, that either his cauſe, or his skill was weake, or elſe he would have ventured upon a ſtronger adverſary. Theſe arguments which I have ſet downe, are the chiefeſt which I have met with againſt this ſubject, and yet the beſt of theſe hath not force enough to endanger the truth that I have delivered.

Unto the two firſt it may be

answered, that the negative authority of Scripture is not prevalent in those things which are not the fundamentalls of Religion.

But you'le reply, though it doe not necessarily conclude, yet 'tis probable if there had beene another world, wee should have had some notice of it in Scripture.

I answer, 'tis as probable that the Scripture should have informed us of the Planets they being very remarkable parts of the Creation, and yet neither *Moses* nor *Job*, nor the *Psalmes* (the places most frequent in Astronomicall observations) mention any of them but the Sunne and Moone, and moreover, you must know, that 'tis besides the scope of the Holy Ghost either in the new Testament or in the old, to reveale any thing unto us concerning the secrets of Philosophy; 'tis not his intent in the new Testament, since

we

we cannot conceive how it might any way belong either to the Historicall exegeticall or prophetical parts of it: nor is it his intent in the old Testament, as is well observed by our Countrey-man Master WRIGHT. *Non Mosis aut Prophetarum institutum fuisse videtur Mathematicas aliquas aut Physicas subtilitates promulgare, sed ad vulgi captum & loquendi morem quemadmodum nutrices infantulis solent sese accommodare.* "'Tis not the endeavour of *Moses* "or the Prophets to discover any "Mathematicall or Philosophicall "subtilties, but rather to accõmo-"date themselves to vulgar capa-"cities, and ordinary speech, as "nurses are wont to use their infants. True indeede, *Moses* is there to handle the history of the Creation, but 'tis observed that he does not any where meddle with such matters as were very hard to be apprehended, for being to informe the common people as well

Epist. ad In Gilbert.

as others, he does it after a vulgar way, as it is commonly noted, declaring the originall chiefely of those things which were obvious to the sense, and being silent of other things, which then could not well be apprehended. And therefore *Aquinas* observes, that *Moses* writes nothing of the aire, because that being invisible, the people knew not whether there were any such body or no. And for this very reason Saint *Austin* also thinkes that there is nothing exprest concerning the creation of Angels which notwithstanding are as remarkable parts of the creatures, and as fit to be knowne as another world. And therefore the Holy Ghost too uses such vulgar expressions which set things forth rather as they appeare, then as they are, as when he calls the Moone one of the greater lights המאורת הגדלים whereas 'tis the least, but one that wee can see in the whole heavens.

Part 1. Q. 68. Art. 3.

Gen. 1. 16.

So

So afterwards ſpeaking of the great raine which drowned the world, he ſaies, the windowes of heaven were opened, becauſe it ſeemed to come with that violence, as if it were, poured out from windows in the Firmament. So that the phraſes which the Holy Ghoſt uſes concerning theſe things are not to be underſtood in a literall ſenſe; but rather as vulgar expreſſions, and this rule is ſet downe by Saint *Auſtin*, where ſpeaking concerning that in the Pſalme, *who ſtretched the earth upon the waters*, hee notes, that when the words of Scripture ſhall ſeeme to contradict common ſenſe or experience, there are they to be underſtood in a qualified ſenſe, and not according to the letter. And 'tis obſerved that for want of this rule, ſome of the ancients have faſtened ſtrange abſurdities upon the words of the Scripture. So Saint *Ambroſe* eſteemed it a hereſie, to thinke, that the Sunne

Gen. 11.

Sr. *W. Rawly* c. 7. §. 6.

l. 2. in Gen.

Pſal. 136. 6.

Wisd. 2. 4. 17. 5. Ecclus. 43. 3. 4.

and starres were not very hot, as being against the words of Scripture, *Psalm.* 19. 6. where the *Psalmist* sayes that there is nothing that is hid from the heate of the Sunne. So others there are that would prove the heavens not to be round, out of that place, *Psal.* 104. 2. *Hee stretcheth out the heavens like a curtaine.* So *Procopius* also was of opinion, that the earth was founded upon the waters, nay, he made it part of his faith, proving it out of *Psal.* 24. 2. *Hee hath founded the earth upon the seas, and established it upon the flouds.* These and such like absurdities have followed, when men looke for the grounds of Philosophie in the words of Scripture. So that from what hath beene said, I may conclude that the silence of Scripture concerning any other world is not sufficient argument to prove that there is none. Thus for the two first arguments.

Com. in c. 1. *Gen.*

Unto

Unto the third, I may anſwer, that this very example is quoted by others, to ſhew the ignorance of thoſe primative times, who did ſometimes condemne what they did not underſtand, and have often cenſur'd the lawfull & undoubted parts of Mathematiques for hereticall, becauſe they themſelves could not perceive a reaſon of it, and therefore their practiſe in this particular, is no ſufficient teſtimony againſt us.

But laſtly I anſwer to all the above named objections, that the terme World, may be taken in a double ſenſe, more generally for the whole Univerſe, as it implies in it the elementary and æthereall bodies, the ſtarres and the earth. Secondly, more particularly for an inferiour World conſiſting of elements. Now the maine drift of all theſe arguments, is to confute a plurality of worlds in the firſt ſenſe, and if there were any ſuch, it might, perhaps, ſeeme ſtrange,

that

that *Moses*, or St. *John* should either not know, or not mention its creation. And *Virgilius* was condemned for this opinion, because he held, *quòd sit alius mundus sub terrâ, aliusq; Sol & Luna*, (as *Baronius*) that within our globe of earth, there was another world, another Sunne and Moone, and so he might seeme to exclude this from the number of the other creatures.

But now there is no such danger in this opinion, which is here delivered, since this world is said to be in the Moone, whose creation is particularly expreſt.

So that in the first sense I yeeld, that there is but one world, which is all that the arguments do prove, but understand it in the second sense, and so I affirme there may be more nor doe any of the above named objections prove the cõtrary.

Neither can this opinion derogate from the divine Wisdome (as *Aquinas* thinkes) but rather advance

vance it, ſhewing a *compendium* of providence, that could make the ſame body a world, and a Moone; a world for habitation, and a Moone for the uſe of others, and the ornament of the whole frame of Nature. For as the members of the body ſerve not onely for the preſervation of themſelves, but for the uſe and convenience of the whole, as the hand protects the head as well as ſaves it ſelfe, ſo is it in the parts of the Univerſe, where each one may ſerve as well for the conſervation of that which is within it, as the helpe of others without it.

Cuſanus de doct. ignor. L.2. c.12.

I have now in ſome meaſure, ſhewed that a plurality of worlds does not contradict any principle of reaſon or place of Scripture, and ſo cleared the firſt part of that ſuppoſition which is applied in the opinion.

It may next be enquired, whether 'tis poſſible there may be a globe of elements in that which we

we call the æthereall parts of the Universe; for if this (as it is according to the common opinion) be priviledged from any change or corruption, it will be in vaine then to imagine any element there, and if we will have another world, we must then seeke out some other place for its situation. The third Proposition therefore shall be this.

Proposition 3.

That the heavens doe not consist of any such pure matter which can priviledge them from the like change and corruption, as these inferiour bodies are liable unto.

IT hath beene often questioned amongst the ancient Fathers and Philosophers, what kind of matter that should be, of which the heavens are framed, whether or no of any fifth substance distinct from the foure elements, as *Aristotle*

ſtotle holds, and with him ſome of the late Schoolemen, whoſe ſubtill braines could not be content to attribute to thoſe vaſt glorious bodies, but common materialls, and therefore they themſelves had rather take paines to preferre them to ſome extraordinary nature, whereas notwithſtanding, all the arguments they could invent, were not able to convince a neceſſity of any ſuch matter, as is confeſt by their owne * ſide. It were much to be deſired, that theſe men had not in other caſes, as well as this, multiplied things without neceſſity, and as if there had not beene enough to be knowne in the ſecrets of nature, have ſpun out new ſubjects from their owne braines to finde more worke for future ages, I ſhall not mention their arguments, ſince 'tis already confeſt, that they are none of them of any neceſſary conſequence, and beſides, you may ſee them ſet downe in any of the bookes *de Cœlo*.

De Cœlo, l. 1. cap. 2.

* *Colleg. Conimb. de Cœlo, l. 1. c. 2. q. 6. art. 3.*

But

But is it the generall consent of the Fathers, and the opinion of *Lombard*, that the heavens consist of the same matter with these sublunary bodies. St. *Ambrose* is confident of it, that hee esteemes the contrary a heresie. True indeed, they differ much among themselves, some thinking them to be made of fire, others of water, but herein they generally agree, that they are all framed of some element or other. For a better confirmation of this, you may see *Ludovicus Molina*, *Euseb. Nirembergius*, with divers others. The venerable *Bede* thought the Planets to consist of all the foure elements, and 'tis likely that the other parts are of an aereous substance, as will be shewed afterward; however, I cannot now stand to recite the arguments for either, I have onely urged these Authorities to countervaile *Aristotle*, and the Schoolemen, and the better to make way for a proof of their corruptibility.

In Hexam. lib. 4.

In opere 6. dierum. disput. 5.

In lib. de Mundi constit.

The

The next thing then to be enquired after, is, whether they be of a corruptible nature, not whether they can be destroyed by God, for this Scripture puts out of doubt. 2Pet.3.12.

Nor whether or no in a long time they would weare away and grow worse, for from any such feare they have beene lately priviledged. But whether they are capable of such changes and vicissitudes, as this inferiour world is liable unto. By Doctor *Hackwell Apol.*

The two chiefe opinions concerning this, have both erred in some extremity, the one side going so farre from the other, that they have both gone beyond the right, whilest *Aristotle* hath opposed the truth, as well as the Stoicks.

Some of the Ancients have thought, that the heavenly bodies have stood in need of nourishment from the elements, by which they were continually fed, and so had divers

divers alterations by reason of their food, this is fathered on *Heraclitus*, followed by that great Naturalist *Pliny*, and in generall attributed to all the Stoicks. You may see *Seneca* expressely to this purpose in these words, *Ex illa alimenta omnibus animalibus, omnibus satis, omnibus stellis dividuntur, hinc profertur quo sustineantur tot Sydera tam exercitata, tam avida, per diem, noctemq;, ut in opere, ita in pastu.* Speaking of the earth, he saies, from thence it is, that nourishment is divided to all the living creatures, the Plants and the Starres, hence were sustained so many constellations, so laborious, so greedy both day and night, as well in their feeding as working. Thus also *Lucan* sings,

Necnon Oceano pasci Phœbumq; polumq; credimus.

Unto these *Ptolome* also that learned Egyptian seemed to agree, when he affirmes that the body of the Moone is moister, and cooler than any of the other Planets, by reason

Plutarch. de plac. philos. l. 2. c. 17. Nat. Hist. l. 2, c. 9

Nat. Quæst. lib. 2. cap. 5.

1. Apost.

reason of the earthly vapours that are exhaled unto it. You see these ancients thought the Heavens to be so farre from this imagined incorruptibility, that rather like the weakest bodies they stood in need of some continuall nourishment without which they could not subsist.

But *Aristotle* and his followers were so farre from this, that they thought those glorious bodies could not containe within them any such principles, as might make them lyable to the least change or corruption, and their chiefe reason was, because we could not in so long a space discerne any alteration amongst them; but unto this I answer.

De cœlo. l. 1. cap. 3.

1. Supposing we could not, yet would it not hence follow that there were none, as hee himselfe in effect doth confesse in another place; for speaking concerning our knowledge of the Heavens, hee sayes 'tis very imperfect and

De Cœlo. l. 2. cap. 3.

difficult, by reason of the vaste distance of those bodies from us, and because the changes which may happen unto it, are not either bigge enough or frequent enough to fall within the apprehension and observation of our senses; no wonder then if hee himselfe bee deceived in his assertions concerning these particulars.

2. Though we could not by our senses see such alterations, yet our reason might perhaps sufficiently convince us of them. Nor can we well conceive how the Sunne should reflect against the Moone, and yet not produce some alteration of heate. *Diogenes* the Philosopher was hence perswaded that those scorching heates had burnt the Moone into the forme of a Pumice-stone.

3. I answer that there have been some alterations observed there; witnesse those comets which have beene seene above the Moone.

So

So that though *Aristotles* consequence were sufficient, when hee proved that the heavens were not corruptible, because there have not any changes being observed in it, yet this by the same reason must bee as prevalent, that the Heavens are corruptible, because there have beene so many alterations observed there; but of these together with a farther confirmation of this proposition, I shall have occasion to speake afterwards; In the meane space, I will referre the Reader to that worke of *Scheiner* a late Jesuit which he titles his *Rosa Vrsina*, where hee may see this point concerning the corruptibility of the Heavens largely handled and sufficiently confirmed.

lib.4.p.2. cy.24,35.

There are some other things, on which I might here take an occasion to enlarge my selfe, but because they are directly handled by many others, and doe not immediately belong to the chiefe

matter in hand, I shall therefore referre the Reader to their authors, and omit any large proofe of them my selfe, as desiring all possible brevity.

1. The first is this: That there are no solid Orbes. If there be a habitable World in the Moone (which I now affirme) it must follow, that her Orbe is not solid, as *Aristotle* supposed; and if not her, why any of the other? I rather thinke that they are all of a fluid (perhaps aereous) substance. Saint *Ambrose*, and Saint *Basil* did endeavour to prove this out of that place in *Isay*, where they are compared to smoake, as they are both quoted by *Rhodiginus*, *Eusebius*, *Nicrembergius* doth likewise from that place confute the solidity and incorruptibility of the Heavens, and cites for the same interpretation the authority of *Eustachius* of *Antioch*; and Saint *Austin*, I am sure seemes to assent unto this opinion, though he does often in

Isa. 51. 6.

Ant. lect. l. 1 c. 4.

Hist. nat. l. 2. c. 11. 13.

In lib. sup. Gen. ad lit.

in his other workes contradict it. The testimony of other Fathers to this purpose you may see in *Sixtus Senensis. l.* 5. *Biblioth. annot.* 14. but for your better satisfaction herein, I shall referre you to the above named *Scheiner* in his *Rosa Ursina*, in whom you may see both authorities and reason, and very largely and distinctly set downe for this opinion, for the better confirmation of which hee adjoynes also some authenticall Epistles of *Fredericus Cæsius Lynceus* a Noble Prince written to *Bellarmine*, containing divers reasons to the same purpose, you may also see the same truth set downe by *Johannes Pena* in his preface to *Euclids Opticks*, and *Christoph. Rothmannus*, both who thought the Firmament to bee onely aire: and though the noble *Tycho* doe dispute against them, yet he himselfe holds, *Quod propius ad veritatis penetralia accedit hæc opinio, quam Aristotelica vulgariter approbata,*

*lib.*4.*p.*11,2 *c.*7.26,30.

*De stella.*15 72. *l.*1.*c.*9.

probata, quæ cœlum pluribus realibus atque impervíis orbibus citra rem replevit. "That this opinion comes "neerer to the truth than that com- "mon one of *Aristotle* which hath "to no purpose filled the heavens "with such reall and impervious "Orbes.

2. There is no element of fire, which must be held with this opinion here delivered; for if wee suppose a world in the Moone, then it will follow, that the spheare of fire, either is not there where 'tis usually placed in the concavity of his Orbe, or else that there is no such thing at all; which is most probable, since there are not any such solid Orbs, that by their swift motion might heare and enkindle the adjoyning aire, which is imagined to be the reason of that element. Concerning this see *Cardan*, *Iohannes Pena* that learned *Frenchman*, the noble *Tycho*, with divers others who have purposely handled this proposition.

3. I might adde a third, *viz.* that there is no Musicke of the spheares, for if they be not solid, how can their motion cause any such sound as is conceived? I doe the rather medle with this, because *Plutarch* speaks as if a man might very conveniently heare that harmony, if he were an inhabitant in the Moone. But I guesse that hee said this out of incogitancy, and did not well consider those necessary consequences which depended upon his opinion. However the world would have no great losse in being deprived of this Musicke, unlesse at some times we had the priviledge to heare it: Then indeede *Philo* the Jew thinkes it would save us the charges of diet, and we might live at an easie rate by feeding at the eare onely, and receiving no other nourishment; and for this very reason (saies he) was *Moses* enabled to tarry forty daies and forty nights in the Mount without eating any

De somniis.

thing, because he there heard the melody of the Heavens, *-Risum teneatis*. I know this Musicke hath had great patrons both sacred and prophane authours, such as *Ambrose*, *Bede*, *Boetius*, *Anselme*, *Plato*, *Cicero* and others, but because it is not now, I thinke affirmed by any, I shall not therefore bestow either paines or time in arguing against it.

It may suffice that I have onely named these three last, and for the two more necessary, have referred the Reader to others for satisfaction. I shall in the next place proceede to the nature of the Moones body, to know whether that be capable of any such conditions, as may make it possible to be inhabited, and what those qualities are wherein it more neerely agrees with our earth.

Prop 4.

Propoſition 4.

That the Moone is a ſolid, compacted, opacous body.

I Shall not need to ſtand long in the proofe of this propoſition, ſince it is a truth already agreed on by the generall conſent of the moſt and the beſt Philoſophers.

1. It is ſolid in oppoſition to fluid, as is the ayre, for how otherwiſe could it beare backe the light which it receives from the Sunne?

But here it may be queſtioned, whether or no the Moone beſtow her light upon us by the reflection of the Sunne-beames from the ſuperficies of her body, or elſe by her owne illumination. Some there are who affirme this latter part. So *Averroes*, *Cælius Rhodiginus*, *Iulius Cæſar*, *&c.* and their reaſon

De cœlo.l.2. com.49.Ant. lection. l.20. c.4. De phænom. lunæ. c.11.

reason is because this light is discerned in many places, whereas those bodies which give light by reflexion can there onely be perceived where the angle of reflexion is equall to the angle of incidence, and this is onely in one place, as in a looking-glasse those beames which are reflected from it cannot bee perceived in every place where you may see the glasse, but onely there where your eye is placed on the same line whereon the beames are reflected.

But to this I answere, that the argument will not hold of such bodies, whose superficies is full of unequall parts and gibbosities as the Moone is. Wherefore it is as well the more probable as the more common opinion, that her light proceedes from both these causes, from reflexion and illumination; nor doth it herein differ from our earth, since that also hath some light by illumination: for how

how otherwise would the parts about us in a Sunne-shine day appeare so bright, when as all the rayes of reflexion cannot enter into our eye?

2. It is compact, and not a spungie and porous substance. But this is denied by *Diogenes*, *Vitellio*, and *Reinoldus*, and some others, who held the Moone to bee of the same kind of nature as a Pumice-stone, and this, say they, is the reason why in the Suns eclipses there appeares within her a duskish ruddy colour, because the Sunne-beames being refracted in passing through the pores of her body, must necessarily be represented under such a colour.

Plut. de pla. phil. l. 2. c. 13 Opt. l. 4. Com. Purbac. Theo. p. 164.

But I reply, if this be the cause of her redness, then why doth she not appeare under the same forme when she is about a sextile aspect, and the darkned part of her body is discernable? for then also doe the same rayes passe through her, and therefore in all likelihood should

should produce the same effect, and notwithstanding those beames are then diverted from us, that they cannot enter into our eyes by a streight line, yet must the colour still remaine visible in her body, and besides according to this opinion, the spots would not alwaies be the same, but divers, as the various distance of the Sunne requires. Againe, if the Sunne-beames did passe through her, why then hath she not a taile as the Comets? why doth she appeare in such an exact round? and not rather attended with a long flame, since it is meerely this penetration of the Sunne beames that is usually attributed to be the cause of beards in blazing starres.

Scaliger exercit. 80. § 13.

3. It is opacous, not transparent or diaphanous like Chrystall or glasse, as *Empedocles* thought, who held the Moone to bee a globe of pure congealed aire, like haile inclosed in a spheare of fire, for then.

Plut. de facie lunæ.

1. Why

1. Why does ſhee not alwaies appeare in the full? ſince the light is diſperſed through all her body?

2. How can the interpoſition of her body ſo darken the Sun, or cauſe ſuch great eclipſes as have turned day into night, that have diſcovered the ſtars, and frighted the birds with ſuch a ſudden darkneſſe, that they fell downe upon the earth, as it is related in divers Hiſtories? And therefore *Herodotus* telling of an Eclipſe which fell in *Xerxes* time, deſcribes it thus: ὁ ἥλιος ἐκλιπὼν τὴν ἐν τῷ οὐρανῷ ἕδρην ἀφανὴς ἦν. The Sunne leaving his wonted ſeate in the heavens, vaniſhed away: all which argues ſuch a great darkneſſe, as could not have beene, if her body had beene perſpicuous. Yet ſome there are who interpret all theſe relations to bee hyperbolicall expreſſions, and the noble *Tycho* thinkes it naturally impoſſible, that any eclipſe ſhould cauſe ſuch darkneſſe, be-

Thucid. Livii. Plut. de fa. Lunæ.

Herodot. l. 7 c. 37.

cauſe

cause the body of the Moone can never totally cover the Sunne; however, in this he is singular, all other Astronomers (if I may believe *Keplar*) being on the contrary opinion, by reason the Diameter of the Moone does for the most part appeare bigger to us then the Diameter of the Sunne.

De phænom. Lunæ. c. 11. But here *Julius Cæsar* once more, puts in to hinder our passage. The Moone (saith he) is not altogether opacous, because 'tis still of the same nature with the Heavens, which are incapable of totall opacity: and his reason is, because perspicuity is an inseparable accident of those purer bodies, and this hee thinkes must necessarily bee granted, for hee stops there, and proves no further; but to this I shall deferre an answere, till hee hath made up his argument.

We may frequently see, that her body does so eclipse the Sunne, as our earth doth the Moone; since then

then the like interposition of them both, doth produce the like effect, they must necessarily be of the like natures, that is a like opacous, which is the thing to be shewed; and this was the reason (as the Interpreters guesse) why *Aristotle* affirmed the Moone to be of the earths nature, because of their agreement in opacity, whereas all the other elements save that, are in some measure perspicuous.

In lib. de animalib.

But the greatest difference which may seeme to make our earth altogether unlike the Moone, is, because the one is a bright body, and hath light of its owne, and the other a grosse darke body which cannot shine at all. 'Tis requisite therefore, that in the next place I cleare this doubt, and shew that the Moone hath no more light of her owne than our earth.

Prop. 5.

Proposition 5.

That the Moone hath not any light of her owne.

TWas the fancy of some of the Jewes, and more especially of *Rabbi Simeon*, that the Moone was nothing else but a contracted Sunne, and that both those planets at their first creation were equall both in light and quantity, for because God did then call them both great lights, therefore they inferred, that they must be both equall in bignesse. But a while after (as the tradition goes) the ambitious Moone put up her complaint to God against the Sunne, shewing, that it was not fit there should be two such great lights in the heavens, a Monarchy would best become the place of order and harmony. Upon this God commanded her to contract her selfe into a narrower compasse, but she being much

Tostatus in 1. Gen. Hieron. de 5. Hide. Hebræoma l. 2. c. 4.

much discontented hereat, replies, What! because I have spoken that which is reason and equity, must I therefore be diminished? This sentence could not chuse but much trouble her; and for this reason was shee in much distresse and griefe for a long space, but that her sorrow might be some way pacified, God bid her be of good cheere, because her priviledges and charet should be greater then the Suns, he should appeare in the day time onely, shee both in the day and night, but her melancholy being not satisfied with this, shee replyed againe, that that alas was no benefit, for in the day-time she should be either not seene, or not noted. Wherefore, God to comfort her up, promised, that his people the Israelites should celebrate all their feasts and holy daies by a computation of her moneths, but this being not able to content her, shee has looked very melancholy ever since; howe-

ver shee hath still reserved much light of her owne.

Others there were, that did thinke the Moone to be a round globe, the one halfe of whose body was of a bright substance, the other halfe being darke, and the divers conversions of those sides towards our eyes, caused the variety of her appearances: of this opinion was *Berosus*, as he is cited by *Vitruvius*, and S^t^. *Austin* thought it was probable enough, but this fancy is almost equally absurd with the former, and both of them sound rather like fables, then philosophicall truths. You may commonly see how this latter does contradict frequent and easie experience, for 'tis observed, that that spot which is perceived about her middle, when she is in the increase, may be discern'd in the same place when she is in the ful: whence it must follow, that the same part which was before darkned, is after inlightened, and that the one part is

Lib. 9. Architecturæ in enarrat. Psalmorum.

is not alwaies darke, and the other light of it selfe, but enough of this, I would be loth to make an enemy, that I may afterwards overcome him, or bestow time in proving that which is already granted. I suppose now, that neither of them hath any patrons, and therefore need no confutation.

'Tis agreed upon by all sides, that this Planet receives most of her light from the Sunne, but the chiefe controversie is, whether or no she hath any of her owne? The greater multitude affirme this. *Cardan* amongst the rest, is very confident of it, and he thinkes that if any of us were in the Moone at the time of her greatest eclipse, *Lunam aspiceremus non secus ac innumeris cereis splendidissimis accensis, atq; in eas oculis defixis cæcutiremus*; "wee should perceive so great a brightnesse of "her owne, that would blind us with the meere sight, and when shee is enlightened by the Sunne, then

De Subtil. lib. 3.

then no eagles eye if there were any there, is able to looke upon her. This *Cardan* saies, and hee doth but say it without bringing any proofe for its confirmation. However, I will set downe the arguments that are usually urged for this opinion, and they are taken either from Scripture or reason; from Scripture is urged that place, 1 *Cor.* 15. where it is said, *There is one glory of the Sunne, and another glory of the Moone. Vlysses Albergettus* urges, that in *Math.* 24.22. ἡ σελήνη οὐ δώσει τὸ φέγγος αὐτῆς, *The Moone shall not give her light*: therefore (saies he) she hath some of her owne.

But to these wee may easily answer that the glory and light there spoken of, may be said to be hers, though it be derived, as you may see in many other instances.

The arguments from reason are taken either

1. From that light which is dis-

discerned in her, when there is a totall eclipse of her owne body, or of the Sunne.

2. For the light which is discerned in the darker part of her body, when she is but a little distant from the Sunne.

1. For when there are any totall eclipses, there appeares in her body a great rednesse, and many times light enough to cause a remarkeable shade, as common experience doth sufficiently manifest: but this cannot come from the Sunne, since at such times either the earth, or her owne body shades her from the Sun-beames, therefore it must proceede from her owne light.

2. Two or three daies after the new Moone, wee may perceive light in her whole body, whereas the rayes of the Sun reflect but upon a small part of that which is visible, therefore 'tis likely that there is some light of her owne.

In answering to these objecti-

ons, I shall first shew, that this light cannot be her owne, and then declare that which is the true reason of it.

That it is not her own, appeares

1. From the variety of it at divers times; for 'tis commonly observed, that sometimes 'tis of a brighter, sometimes of a darker appearance, now redder, and at another time of a more duskish colour. The observation of this variety in divers eclipses, you may see set downe by *Keplar* and many others, but now this could not be if that light were her owne, that being constantly the same, and without any reason of such an alteration: So that thus I may argue.

Opt. Astron. c. 7. num. 3.

If there were any light proper to the Moone, then would that Planet appeare brightest when she is eclipsed in her Perige, being neerest to the earth, and so consequently more obscure and duskish when she is in her Apoge or farthest

theſt from it; the reaſon is, becauſe the neerer any enlightened body comes to the ſight, by ſo much the more ſtrong are the ſpecies and the better perceived. This ſequell is granted by ſome of our adverſaries, and they are the very words of noble *Tycho*, *Si luna genuino gauderet lumine, utiq; cum in umbra terræ eſſet, illud non amitteret, ſed eò evidentiùs excereret, omne enim lumen in tenebris, plus ſplendet cum alio majore fulgore non præpeditur.* If the Moone had any light of her owne, then would ſhe not loſe it in the earths ſhadow, but rather ſhine more clearely, ſince every light appeares greater in the darke, when it is not hindered by a more perſpicuous brightneſſe.

De nova ſtella lib. 1. c. 10.

But now the event falls out cleane contrary, (as obſervation doth manifeſt, and our oppoſites themſelves doe grant) the Moone appearing with a more reddiſh and cleare light when ſhe is eclip-

Reinhold *comment. in Purb. Theor. pag.* 164.

sed being in her Apoge or farthest distance, and a more blackish yron colour when she is in her Perige or neerest to us, therefore shee hath not any light of her owne. Nor may we thinke that the earths shadow can cloud the proper light of the Moone from appearing, or take away any thing from her inherent brightnesse, for this were to thinke a shadow to be a body, an opinion altogether mis-becomming a Philosopher, as *Tycho* grants in the fore-cited place, *Nec umbra terræ corporeum quid est, aut densa aliqua substantia, aut lunæ lumen obtenebrare possit, atq; id visui nostro præripere, sed est quædam privatio luminis solaris, ob interpositum opacum corpus terræ.* Nor is the earths shadow any corporall thing, or thicke substance, that it can cloud the Moones brightnesse, or take it away from our sight, but it is a meere privation of the Suns light, by reason of the interposition of the earths opacous body.

2. If

2. If ſhee had any light of her owne then that would in it ſelfe be, either ſuch a ruddy brightneſſe as appeares in the eclipſes, or elſe ſuch a leaden duskiſh light as wee ſee in the darker parts of her body, when ſhee is a little paſt the conjunction. (That it muſt be one of theſe may follow from the oppoſite arguments) but it is neither of theſe, therefore ſhe hath none of her owne.

1. 'Tis not ſuch a ruddy light as appeares in eclipſes, for then why can wee not ſee the like redneſſe, when wee may diſcerne the obſcurer parts of the Moone?

You will ſay, perhaps, that then the neereneſſe of that greater light, takes away that appearance.

I reply, this cannot be, for then why does Mars ſhine with his wonted redneſſe, when he is neere the Moone? or why cannot her greater brightneſſe make him appeare white as the other Planets?

nor

nor can there be any reason given why that greater light should represent her body under a false colour.

2. 'Tis not such a duskish leaden light, as we see in the darker part of her body, when shee is about a sextile Aspect distant from the Sunne, for then why does shee appeare red in the eclipses, since the more shade cannot choose such variety, for 'tis the nature of darknesse by its opposition, rather to make things appeare of a more white and cleare brightnesse then they are in themselves, or if it be the shade, yet those parts of the Moone are then in the shade of her body, and therefore in reason should have the like rednesse. Since then neither of these lights are hers, it followes that she hath none of her owne. Nor is this a singular opinion, but it hath had many learned patrons, such was *Macrobius*, who being for this quoted of *Rhodiginus*, he calls him

Somn. Scip. l. 1. c. 20.

vir

vir reconditissimæ scientiæ, a man who knew more than ordinary Philosophers, thus commending the opinion in the credit of the Authour. To him assents the Venerable *Bede*, upon whom the glosse hath this comparison. As the Looking-glasse represents not any image within it selfe, unlesse it receive some from without; so the Moone hath not any light, but what is bestowed by the Sun. To these agreed *Albertus Magnus*, *Scaliger*, *Mæslin*, and more especially *Mulapertius*, whose words are more pat to the purpose then others, and therefore I shall set them downe as you may finde them in his Preface to his Treatise concerning the *Austriaca sydera*; *Luna*, *Venus*, & *Mercurius*, *terrestris & humidæ sunt substantiæ, ideoq; de suo non lucere, sicut nec terra.* The Moone, *Venus*, and *Mercurie* (saith he) are of an earthly and moyst substance, and therefore have no more light of their

Lect. antiq. l. 1. c. 15.

In lib. de natur. rerum

De 4r Coævis. Q. 4a. Art. 21. Exercit. 62. 1. Epitome. Astron. lib. 4. p. 2.

their owne, then the earth hath. Nay, some there are who thinke that all the other Starres doe receive that light, whereby they appeare visible to us from the Sunne, so *Ptolomie*, *Isidore Hispalensis*, *Albertus Magnus*, and *Bede*, much more then must the Moone shine with a borrowed light.

Originum l. 3. c. 69. De Cœlo. l. 2. De ratione tempor. c. 4.

But enough of this. I have now sufficiently shewed what at the first I promised, that this light is not proper to the Moone. It remaines in the next place, that I tell you the true reason of it. And here, I thinke 'tis probable that the light which appeares in the Moone at the eclipses is nothing else but the second species of the Sunnes rayes which passe through the shadow unto her body: and from a mixture of this second light with the shadow, arises that rednesse which at such times appeares unto us. I may call it *Lumen crepusculum*, the *Aurora* of the

the Moone, or ſuch a kinde of bluſhing light, that the Sunne cauſes when he is neere his riſing, when he beſtowes ſome ſmall light upon the thicker vapours. Thus wee ſee commonly the Sunne being in the Horizon, and the reflexion growing weake, how his beames make the waters appeare very red.

The Moabites in *Iehorams* time when they roſe early in the morning, and beheld the waters a farre off, miſtooke them for blood. *Et cauſa hujus eſt, quia radius ſolaris in aurora contrahit quandam rubedinem, propter vapores combuſtos manentes circa ſuperficiem terræ, per quos radii tranſeunt, & ideo cum repercutiantur in aqua ad oculos noſtros, trahunt ſecum eundem ruborem, & faciunt apparere locum aquarum, in quo eſt repercuſſio eſſe rubrum*, ſaith *Toſtatus*. The reaſon is, becauſe of his rayes, which being in the lower vapours, thoſe doe convey an imperfect mixed light

2 King. 3. 22.

22. *Quæſt. in hoc cap.*

light upon the waters. Thus the Moone being in the earths shadow, and the Sunne beames which are round about it, not being able to come directly unto her body, yet some second raies there are, which passing through the shadow, make her appeare in that ruddy colour: So that she must appeare brightest, when shee is eclipsed, being in her Apoge, or greatest distance from us, because then the cone of the earths shadow is lesse, and the refraction is made through a narrower medium. So on the contrary, she must be represented under a more darke and obscure forme when she is eclipsed, being in her Perige, or neerest to the earth, because then she is involved in a greater shadow, or bigger part of the cone, and so the refraction passing through a greater medium, the light must needes be weaker which doth proceed from it. If you aske now what the reason may be of that light which we

discerne

discerne in the darker part of the new Moone: I answer, 'tis reflected from our earth which returnes as great a brightnesse to that Planet, as it receives from it. This I shall have occasion to prove afterward.

I have now done with these propositions which were set downe to cleare the passage, and confirme the suppositions implied in the opinion, I shall in the next place proceed to a more direct treating of the chiefe matter in hand.

Proposition 6.

That there is a world in the Moone, hath beene the direct opinion of many ancient, with some moderne Mathematicians, and may probably be deduced from the tenents of others.

SInce this opinion may be suspected of singularity, I shall there-

therefore first confirme it by sufficient authority of divers authours, both ancient and moderne, that so I may the better cleare it from the prejudice either of an upstart fancy, or an absolute errour. This is by some attributed to *Orpheus*, one of the most ancient Greeke Poets, who speaking of the Moone, saies thus, ἡ πολλ' ὄρεα ἔχει, πολλ' ἄστεα, πολλὰ μέλαθρα, That it hath many mountaines and cities, and houses in it. To him assented *Xenophanes*, *Anaxagoras*, *Democritus*, and *Heraclitus*, all who thought it to have firme solid ground, like to our earth, containing in it many large fields, champion grounds, and divers inhabitants, unto these agreed *Pythagoras*, who thought that our earth was but one of the Planets which moved round about the Sunne, (as *Aristotle* relates it of him) and the *Pythagoreans* in generall did affirme, that the Moone also was terrestriall, that she was inhabited as

Plut. de plac. phil. l. 2. c. 13

Ibid. c. 25.

Diog. Laert. l. 2. & l. 9.

De Cælo. l. 2. cap. 13.

as this lower world. That those living creatures & plants which are in her, exceed any of the like kind with us in the same proportion, as their daies are longer than ours: *viz.* by 15. times. This *Pythagoras* was esteemed by all, of a most divine wit, as appeares especially by his valuation amongst the *Romans* who being cõmanded by the Oracle to erect a statue to the wisest *Grecian*, the Senate determined *Pythagoras* to be meant, preferring him in their judgements before the divine *Socrates*, whom their Gods pronounc'd the wisest. Some think him a *Iew* by birth, but most agree that hee was much conversant amongst the learneder sort, & Priests of that Nation, by whom he was informed of many secrets, and perhaps, his opinion, which he vented afterwards in *Greece*, where he was much opposed by *Aristotle* in some worded disputations, but never confuted by any solid reason.

Plut. ibid. cap. 30.

Plin. Nat. Hist. l. 34. cap. 6.

To this opinion of *Pythagoras*

did *Plato* also assent, when hee considered that there was the like eclipse made bythe earth, and this, that it had no light of its owne, that it was so full of spots. And therefore wee may often reade in him and his followers, of an *ætherea terra*, and *lunares populi*, an æthereall earth, and inhabiters in the Moone; but afterwards this was mixed with many ridiculous fancies: for some of them considering the mysteries implied in the number 3. concluded that there must necessarily bee a Trinity of worlds, whereof the first is this of ours, the second in the Moone whose element of water is represented by the spheare of *Mercury*, the aire by *Venus*, and the fire by the Sunne. And that the whole Universe might the better end in earth as it began, they have contrived it, that *Mars* shall be a spheare of the fire, *Iupiter* of aire, *Saturne* of water; and above all these, the Elysian fields, spacious and

Plat. de conviviis. Macrob. Somn. Scip. lib. 1. ca. 11.

and pleasant places appointed for the habitation of those unspotted soules, that either never were imprisoned in, or else now have freed themselves from any commerce with the body. *Scaliger* speaking of this *Platonicke* fancie, *quæ in tres trientes mundum quasi assem divisit*, thinks 'tis confutation enough, to say, 'tis *Plato's*. However for the first part of this assertion, it was assented unto by many others, and by reason of the grossnesse and inequality of this planet, 'twas frequently called *quasi terra cœlestis*, as being esteemed the sediment and more imperfect part of those purer bodies, you may see this proved by *Plutarch*, in that delightfull work which he properly made for the confirmation of this particular. With him agreed *Alcinous* and *Plotinus*, later Writers. Unto these I might also adde the imperfect testimony of *Mahomet*, whose authority of grant can adde but little credit to this opinion,

Exercit. 62.

De facie Lunæ.

Instit. ad discip. Plat. Cæl. Rhodig. l. 1. c. 4.

because hee was an ignorant imposter, but yet consider that originall, from whence hee derived most of his knowledge, and then, perhaps, his witnesse may carry with it some probablity. He is commonly thought by birth to be an Ismaelite, being instructed by the Jewes in the secrets of their Philosophy, and perhaps, learned this from those Rabbies, for in his *Alcaron*, hee talkes much of mountaines, pleasant fields, and cleare rivers in the heavens, but because he was for the maine very unlearned, he was not able to deliver any thing so distinctly as he was informed. The Cardinall *Cusanus* and *Iornandus Bunus*, held a particular world in every Starre, and therefore one of them defining our earth, he saies, it is *stella quædam nobilis, quæ lunam & calorem & influentiam habet aliam, & diversam ab omnibus aliis stellis*; a "noble starre having a distinct "light, heat and influence from all "the

Azoara. 57. & 65.

Cusa. de doct. ign. l. 2. cap. 12.

" the rest. Unto this *Nichol. Hill*, a country man of ours was inclined, when he said *Astrea terræ natura probabilis est:* " That 'tis probable " the earth hath a starry nature.

Philos. epicur. part. 434.

But the opinion which I have here delivered was more directly proved by *Mæstin Keplar*, and *Galilæus*, each of them late writers, and famous men for their singular skill in Astronomy. As for those workes of *Mæstin* and *Keplar* wherein they doe more expresly treate of this opinion, I have not yet had the happinesse to see them. However their opinions appeare plaine enough from their owne writings, and the testimony of others concerning them. But *Iulius Cæsar*, whom I have above quoted, speaking of their testimony whom I now cite for this opinion, *viz. Keplar* and *Galilæus* affirmes that to his knowledge they did but jest in those things which they write concerning this, and as for any such world, he assu-

In Thesibus dissertatio cum Nic. Hill. Nuncius Sydereus.

De phænom. lunæ, c. 4.

redly knowes they never so much as dreamt of it. But I had rather believe their owne words, then his pretended knowledge.

'Tis true indeed, in many things they doe but trifle, but for the maine scope of those discourses, 'tis as manifest they seriously meant it, as any indifferent Reader may easily discerne; otherwise sure *Campanella* (a man as well acquainted with his opinion, and perhaps his person as *Cæsar* was) would never have writ an apologie for him. And besides 'tis very likely if it had beene but a jest, *Galilæus* would never have suffered so much for it as afterwards he did. But as for the knowledge which hee pretends, you may guesse what it was by his confidence (I say not presumption) in other assertions, and his boldnesse in them may well derogate from his credit in this. For speaking of *Ptolome's Hypothesis* he pronounces this verdict, *Impossibile est excen-*

Cap. 7.

centricorum & epicyclorum positio, nec aliquis est ex Mathematicis adeo stultus qui veram illam existimet. " The position of *Excen-* " *tricks* and *Epicycles* is altogether " impossible, nor is there any " Mathematician such a foole as " to thinke it true. I should guesse hee could not have knowledge enough to maintaine any other Hypothesis who was so ignorant in Mathematicks, as to deny that any good Authour held this. For I would faine know whether there were never any that thought the Heavens to be solid bodies, and that there were such kindes of motion as is by those feined Orbes supplyed; if so, then *Cæsar la Galla* was much mistaken. I thinke his assertions are equally true, that *Galilæus* and *Keplar* did not hold this, and that there were none which ever held that other.

But in my following discourse I shall most insist on the observation of *Galilæus*, the inventour of

that famous perspective, whereby we may discerne the heavens hard by us, whereby those things which others have formerly guest at are manifested to the eye, and plainely discovered beyond exception or doubt, of which admirable invention, these latter ages of the world may justly boast, and for this expect to be celebrated by posterity. 'Tis related of *Eudoxus*, that hee wished himselfe burnt with *Phaeton*, so he might stand over the Sunne to contemplate its nature; had hee lived in these daies, he might have enjoyed his wish at an easie rate, and scaling the heavens by this glasse, might plainely have discerned what hee so much desired. *Keplar* considering those strange discoveries which this perspective had made, could not choose but cry out in a προσωποποιία and rapture of admiration. *O multiscium & quovis sceptro pretiosius perspicillum! an qui te dextra tenet, ille non dominus*

con-

constituatur operum Dei? And *Johannes Fabricius* an elegant writer, speaking of the same glasse, and for this invention preferring our age before those former times of greater ignorance, saies thus; *Adeo sumus superiores veteribus, ut quam illi carminis magici pronunciatu de missam representâsse putantur nos non tantum innocenter demittamus, sed etiam familiari quodam intuitu ejus quasi conditionem intueamur.* "So much are wee "above the ancients, that whereas "they were faine by their magical "charms to represent the Moones "approach, wee cannot onely "bring her lower with a greater "innocence, but may also with "a more familiar view behold "her condition. And because you shall have no occasion to question the truth of those experiments, which I shal afterwards urge from it; I will therefore set downe the testimony of an enemy, and such a witnesse hath alwaies beene accounted

De macula in sole obser.

De phænom. c. I.

counted prevalent: you may see it in the abovenamed *Cæsar la Galla*, whose words ate these: *Mercurium caduceum gestantem, cœlestia nunciare, & mortuorum animas ab inferis revocare sapiens finxit antiquitas. Galilæum verò novum Iovis interpretem Telescopio caducæo instructum Sydera aperire, & veterum Philosophorum manes ad superos revocare solers nostra ætas videt & admiratur.* Wise antiquity fabled *Mercury* carrying a rodde in his hand to relate newes from Heaven, and call backe the soules of the dead, but it hath beene the happinesse of our industrious age to see and admire *Galilæus* the new Embassadour of the Gods furnished with his perspective to unfold the nature of the Starres, and awaken the ghosts of the ancient Philosophers. So worthily and highly did these men esteeme of this excellent invention.

Now if you would know what

might be done by this glasse, in the sight of such things as were neerer at hand, the same Authour will tell you, when hee sayes, that by it those things which could scarce at all bee discerned by the eye at the distance of a mile and a halfe, might plainely and distinctly bee perceived for 16 Italian miles, and that as they were really in themselves, without any transposition or falsifying at all. So that what the ancient Poets were faine to put in a fable, our more happy age hath found out in a truth, and we may discerne as farre with these eyes which *Galilæus* hath bestowed upon us, as *Lynceus* could with those which the Poets attributed unto him. But if you yet doubt whether all these observations were true, the same Authour may confirme you, when hee saies they were shewed, *Non uni aut alteri, sed quamplurimis, neq; gregariis hominibus, sed præcipuis atq; disciplinis omnibus, nec*

ibid. c. 5.

Cap. 1.

necnon Mathematicis & opticis præceptis, optimè instructis sedulâ ac diligenti inspectione. "Not to "one or two, but to very many, "and those not ordinary men, but "to those who were well vers'd "in Mathematickes and Opticks, "and that not with a meere glance "but with a sedulous and dili-"gent inspection. And least any scruple might remaine unanswe-red, or you might thinke the men who beheld all this though they might be skilfull, yet they came with credulous minds, and so were more easie to be deluded. He addes that it was shewed, *vius qui ad experimenta hæc contradicendi animo accesserant.* "To such as "were come with a great deale of "prejudice, and an intent of con-"tradiction. Thus you may see the certainety of those experi-ments which were taken by this glasse. I have spoken the more concerning it, because I shall bor-row many things in my farther discourse,

Cap. 5.

discourse, from those discoveries which were made by it.

I have now cited such Authors both ancient and moderne, who have directly maintained the same opinion. I told you likewise in the proposition that it might probably be deduced from the tenent of others: such were *Aristarchus*, *Philolaus* and *Copernicus*, with many other later writers who assented to their hypothesis, so *Ioach. Rhelicus*, *David Origanus* *Lansbergius*, *Guil. Gilbert*, and (if I may believe *Campanella*) *Innumeri alii Angli & Galli.* Very many others both English and French, all who affirmed our Earth to be one of the Planets, and the Sunne to bee the Centre of all, about which the heavenly bodies did move, and how horrid soever this may seeme at the first, yet is it likely enough to be true, nor is there any maxime or observation in Opticks (saith *Pena*) that can disprove it.

Apologia pro Galileo.

Now

Now if our earth were one of the Planets (as it is according to them) then why may not another of the Planets be an earth?

Thus have I shewed you the truth of this proposition: Before I proceede farther, 'tis requisite that I informe the Reader, what method I shall follow in the proving of this chiefe assertion, that there is a World in the Moone.

à 1°. cap. ad 10m.

The order by which I shall bee guided will be that which *Aristotle* uses in his booke *De mundo* (if that booke were his.)

First, περὶ τῶν ἐν αὐτῷ of those chiefe parts which are in it; not the elementary and æthereall (as he doth there) since this doth not belong to the elementary controversie, but of the Sea and Land, &c. Secondly, περὶ αὐτῷ παθῶν, of those things which are extrinsecall to it, as the seasons, meteors and inhabitants.

Prop. 7.

Propoſition 7.

That thoſe ſpots and brighter parts which by our ſight may be diſtinguiſhed in the Moone, doe ſhew the difference betwixt the Sea and Land in that other World.

FOr the cleare proofe of this propoſition, I ſhall firſt reckon up and refute the opinions of others concerning the matter and forme of thoſe ſpots, and then ſhew the greater probability of this preſent aſſertion, and how agreeable it is to that truth, which is moſt commonly received; as for the opinions of other concerning theſe, they have beene very many, I will only reckon up thoſe which are common and remarkeable.

Some there are that thinke thoſe ſpots doe not ariſe from any deformity

formity of the parts, but a deceit of the eye, which cannot at such a distance discerne an equall light in that planet, but these do but onely say it, and shew not any reason for the proofe of their opinion: Others think that there some bodies betwixt the Sunne and Moone, which keeping off the lights in some parts, doe by their shadow produce these spots which wee there discerne.

So *Bede* in *à.de Mund. constit.*

Others would have them to be the figure of the mountaines here below represented there as in a looking-glasse. But none of those fancies can bee true, because the spots are stil the same, & not varied according to the difference of places, and besides, *Cardan* thinks it is impossible that any image should be conveyed so farre as there to be represented unto us at such a distance, but tis commonly related of *Pythagoras*, that he by writing, what he pleased in a glasse, by the reflexiõ of the same species, would make

De subtil. lib.3.

make those letters to appeare in the circle of the Moone, where they should be legible by any other, who might at that time be some miles distant from him. * *Agrippa* affirmes this to be possible, and the way of performing it not unknowne to himselfe, with some others in his time. It may be that our Bishop did by the like meanes performe those strange conclusions which hee professes in his *Nuncius inanimatus*, where hee pretends that hee can informe his friends of what he pleases, though they be an hundred miles distant, *forte etiam, vel milliare millesimum*, they are his owne words, and, perhaps, a thousand, and all this in a minutes space, or little more, quicker than the Sunne can move.

* *Occulta ad Philos. l. 1. cap. 6.*

Now, what conveyance there should be for so speedy a passage, I cannot conceive, unlesse it be carried with the light, then which wee know not any thing quicker; but of this onely by the way;

however, whether those images can be represented so or not, yet certaine it is, those spots are not such representations. Some thinke that when God had at first created too much earth to make a perfect globe, not knowing well where to bestow the rest, he placed it in the Moone, which ever since hath so darkened it in some parts, but the impiety of this is sufficient confutation, since it so much detracts from the divine power and wisedome.

The * Stoicks held that planet to be mixed of fire and aire, and in their opinion, the variety of its composition, caused her spots: *Anaxagoras* thought all the starres to be of an earthly nature, mixed with some fire, and as for the Sunne, hee affirmed it to be nothing else but a fiery stone; for which later opinion, the *Athenians* sentenc'd him to death; those zealous Idolaters counting it a great blasphemy, to make their God

* *Plut. de placit. phil. l.2. c.25.*

Iosephus l.2. con. App. August. de Civit. Dei. l.18.c.41.

God a ſtone, whereas notwithſtanding, they were ſo ſenſleſſe in their adoration of Idolls, as to make a ſtone their God, this *Anaxagoras* affirmed the Moone to be more terreſtriall then the other, but of a greater purity then any thing here below, and the ſpots hee thought were nothing elſe, but ſome cloudy parts, intermingled with the light which belonged to that Planet, but I have above deſtroyed the ſuppoſition on which this fancy is grounded: *Pliny* thinkes they ariſe from ſome droſſie ſtuffe, mixed with that moyſture which the Moone attracts unto her ſelfe, but hee was of their opinion, who thought the ſtarres were nouriſhed by ſome earthly vapours, which you may commonly ſee refuted in the *Commentators* on the bookes, *de Cœlo.*

Nat. Hiſt. lib. 2. c. 9.

Vitellio and *Reinoldus* affirme the ſpots to be the thicker parts of the Moone, into which the Sunne cannot infuſe much light,

Opt. lib. 9. Comment. in Purb. pag. 164.

and this (say they) is the reason, why in the Sunnes eclipses, the spots and brighter parts are still in some measure distinguished, because the Sunne beames are not able so well to penetrate through those thicker, as they may through the thinner parts of that Planet. Of this opinion also was *Cæsar la Galla*, whose words are these, "The Moone doth there appeare "cleareſt, where shee is transpi-"cuous, not onely through the "superficies, but the substance "also, and there she seemes spot-"ted, where her body is most "opacous. The ground of this his assertion was, because hee thought the Moone did receive and bestow her light by illumination onely, and not at all by reflexion, but this, together with the supposed penetration of the Sunne beames, and the perspicuity of the Moones body I have above answered and refuted.

Ex qua parte luna est transpicua non solum secundum superficiem, sed etiam secundum substantiam, eatenus clara, ex qua autem parte opaca est, eatenus obscura videtur. De Phænom. cap. 11.

The

The more common and generall opinion is, that the ſpots are the thinner parts of the Moone, which are leſſe able to reflect the beames that they receive from the Sunne, and this is moſt agreeable to reaſon, for if the ſtarres are therefore brighteſt, becauſe they are thicker and more ſolid then their orbes, then it will follow, that thoſe parts of the Moone which have leſſe light, have alſo leſſe thickeneſſe. It was the providence of nature (ſay ſome) that ſo contrived that planet to have theſe ſpots within it, for ſince that is neereſt to thoſe lower bodies which are ſo full of deformity, 'tis requiſite that it ſhould in ſome meaſure agree with them, and as in this inferiour world the higher bodies are the moſt compleat, ſo alſo in the heavens perfection is aſcended unto by degrees, and the Moone being the loweſt, muſt be the leaſt pure, and therefore *Philo* the Jew interpreting

Albert. mag. de Cœvis. Q. 4. Art. 21. Colleg. Con.

De Somniis.

ting *Iacobs* dreame concerning the ladder, doth in an allegory shew, how that in the fabricke of the world, all things grow perfecter as they grow higher, and this is the reason (saith hee) why the Moone doth not consist of any pure simple matter, but is mixed with aire, which shewes so darkely within her body.

But this cannot be a sufficient reason, for though it were true that nature did frame every thing perfecter as it was higher, yet is it as true, that nature frames every thing fully perfect for that office to which shee intends it. Now, had she intended the Moone meerly to reflect the Sunne beames and give light, the spots then had not so much argued her providence, as her unskilfulnesse and imperfection, as if in the haste of her worke shee could not tell how to make that body exactly fit, for that office to which she appointed it.

Scalig. exercit. 62.

Tis likely then that she had some other

other end which moved her to produce this variety, and this in all probability was her intent to make it a fit body for habitation with the ſame conveniencies of ſea and land, as this inferiour world doth partake of. For ſince the Moone is ſuch a vaſt, ſuch a ſolid and opacous body like our earth (as was above proved) why may it not be probable, that thoſe thinner and thicker parts appearing in her, doe ſhew the difference betwixt the ſea and land in that other world; and *Galilæus* doubts not, but that if our earth were viſible at the ſame diſtance, there would be the like appearance of it.

As for the forme of thoſe ſpots, ſome of the vulgar thinke they repreſent a man, and the Poets gueſſe 'tis the boy *Endimion*, whoſe company ſhee loves ſo well, that ſhee carries him with her, others will have it onely to be the face of a man as the Moone is uſually pictured, but *Albertus* thinkes rather,

that it represents a Lyon with his taile towards the East, and his head the West, and * some others have thought it to be very much like a Fox, & certainly 'tis as much like a Lyon as that in the *Zodiake*; or as *Vrsa major* is like a Beare.

* Eusebius Nioremb. *Hist. Nat. lib.8.c.15.*

I should guesse that it represents one of these as well as another, and any thing else as well as any of these, since 'tis but a strong imagination, which fancies such images as schoole-boyes usually doe in the markes of a wall, whereas there is not any such similitude in the spots themselves, which rather like our Sea, in respect of the land, appeares under a rugged and confused figure, and doth not represent any distinct image, so that both in respect of the matter and the forme it may be probable enough, that those spots and brighter parts may shew the distinction betwixt the Sea and Land in that other world.

Proposition 8.

The spots represent the Sea, and the brighter parts the Land.

WHen I first compared the nature of our earth and water with those appearances in the Moone; I concluded contrary to the proposition, that the brighter parts represented the water, and the spots the land; of this opinion likewise was *Keplar* at the first, but my second thoughts, and the reading of others, have now convinced me (as after he was) of the truth of that Proposition which I have now set downe. But before I come to the confirmation of it, I shall mention those scruples which at first made mee doubt of the truth of this opinion.

Opt. Astro. c. 6. num. 9. Dissert. cum nuncio Gal.

1. It may be objected, 'tis probable, if there be any such sea and land as ours, that it bears some proportion and similitude with ours: but now this Proposition takes away

way all likeneſſe betwixt them, for whereas the ſuperficies of our earth is but the third part of the whole ſurface in the globe, two parts being overſpread with the water (as *Scaliger* obſerves) yet here according to this opinion, the Sea ſhould be leſſe then the Land, ſince there is not ſo much of the beſpotted, as ther is of the enlightened parts, wherefore 'tis probable, that either there is no ſuch thing at all, or elſe that the brighter parts are the Sea.

Exercit. 38.

2. The water, by reaſon of the ſmoothneſſe of its ſuperficies, ſeemes better able to reflect the Sun beames then the earth, which in moſt places is ſo full of ruggedneſſe of graſſe and trees, and ſuch like impediments of reflection, and beſides, cõmon experience ſhewes, that the water ſhines with a greater and more glorious brightneſſe then the earth, therefore it ſhould ſeeme that the ſpots are the earth, and the brighter parts the water.

But

But to the first it may be answered.

1. There is no great probability in this consequence, that because 'tis so with us, therefore it must be so with the parts of the Moone, for since there is such a difference betwixt them in divers other respects, they may not, perhaps, agree in this.

2. That assertion of *Scaliger* is not by all granted for a truth. *Fromondus* with others, thinke, that the superficies of the Sea and Land in so much of the world as is already discovered, is equall, and of the same extension. *De Meteoris l. 5. c. 1. Art. 1.*

3. The Orbe of thicke and vaporous aire which encompasses the Moone, makes the brighter parts of that Planet appeare bigger then in themselves they are; as I shall shew afterwards.

To the second it may be answered, that though the water be of a smooth superficies, and so may seeme most fit to reverberate the light,

light, yet because 'tis of a perspicuous nature, therefore the beames must sinke into it, and cannot so strongly and clearely be reflected. *Sicut in speculo ubi plumbum abrasum fuerit*, (saith *Cardan*) as in Looking-glasses where part of the lead is raized off, and nothing left behind to reverberate the image, the species must there passe through and not backe againe; so it is where the beames penetrate and sinke into the substance of the body, there cannot be such an immediate and strong reflection as when they are beate backe from the superficies, and therefore the Sunne causes a greater heate by farre upon the Land then upon the water. Now as for that experiment, where 'tis said, that the waters have a greater brightnesse then the Land: I answer, 'tis true onely there where they represent the image of the Sunne or some bright cloud, and not in other places, as is very plaine

plaine by common obſervation.

So that notwithſtanding thoſe doubts, yet this Propoſition may remaine true, that the ſpots may be the Sea, and the brighter parts the Land. Of this opinion was *Plutarch*: unto him aſſented *Keplar* and *Galilæus*, whoſe words are theſe, *Si quis veterum Pythagoræorum ſententiam excuſcitare velit, lunam ſcilicet eſſe quaſi telluren alteram, ejus pars lucidior terrenam ſuperficiem, obſcurior verò aqueam magis congruè repræſentet. Mihi autem dubium fuit nunquam terreſtris globi à longè conſpecti, atq; a radiis ſolaribus perfuſi, terream ſuperficiem clariorem, obſcuriorem verò aqueam ſeſe in conſpectum daturam.* "If any man have a "minde to renew the opinion of "the *Pythagoreans*, that the "Moone is another earth, then "her brighter parts may fitly re-"preſent the earths ſuperficies, "and the darker part the water: "and for my part, I never doubted "but

De facie lun. Diſſertatio. Nunc. Syd.

"but that our earthly globe being "shined upon by the Sunne, and "beheld at a great distance, the "Land would appeare brightest "and the Sea more obscurely. The reasons may be.

1. That which I urged about the foregoing Chapter, because the water is the thinner part, and therefore must give the lesse light.

2. Because observation tels us, that the spotted parts are alwaies smooth and equall, having every where an equality of light, when once they are enlightened by the Sunne, whereas the brighter parts are full of rugged gibbosities and mountaines having many shades in them, as I shall shew more at large afterwards.

Apologia pro Galileo.

That in this Planet there must be Seas, *Campanella* indeavours to prove out of Scripture interpreting the *waters above the Firmament* spoken of in *Genesis* to be meant of the Sea in this world. For (saith he) 'tis not likely that there

there are any ſuch waters above the Orbes to moderate that heate which they receive from their ſwift motion (as ſome of the Fathers thinke) nor did *Moſes* meane the Angells which may be called ſpirituall waters, as *Origen* and *Auſtin* would have it, for both theſe are rejected by the generall conſent: nor could he meane any waters in the ſecond region, as moſt Commentators interpret it. For firſt there is nothing but vapours, which though they are afterwards turned into water, yet while they remaine there, they are onely the matter of that element, which may as well be fire or earth, or aire. 2. Thoſe vapors are not above the *expanſum*, but in it. So that hee thinkes there is no other way to ſalve all, but by making the Planets ſeverall worlds with Sea & Land, with ſuch Rivers and Springs, as wee have here below: Eſpecially ſince *Eſdras* ſpeakes of the ſprings above the Fir-

Confeſſion. l.13.c.32.

2 Eſdr.4.7.

Firmament, but I cannot agree with him in this, nor doe I thinke that any such thing can be proved out of Scripture.

Before I proceede to the next Position, I shall first answer some doubts which might be made against the generality of this truth, whereby it may seeme impossible that there should be either Sea or Land in the Moone; for since she moves so swiftly as Astronomers observe, why then does there nothing fall from her, or why doth shee not shake something out by the celerity of her revolution? I answer, you must know that the inclination of every heavie body, to its proper Center doth sufficiently tie it unto its place, so that suppose any thing were separated, yet must it necessarily returne againe, and there is no more danger of their falling into our world then there is feare of our falling into the Moone.

But yet there are many fabulous relations

relations of ſuch things as have dropped thence. There is a tale of the Nemean Lyon that *Hercules* ſlew, which firſt ruſhing among the heards out of his unknowne den in the Mountaine of *Cytheron* in *Bœotia*, the credulous people thought he was ſent from their Goddeſſe the Moone. And if a whirle-winde did chance to ſnatch any thing up, and afterwards raire it downe againe, the ignorant multitude are apt to believe that it dropt from Heaven. Thus *Avicenna* relates the ſtory of a Calfe which fell downe in a ſtorme, the beholders thinking it a Moon-calfe, and that it fell thence. So *Cardan* travelling upon the Apennine Mountaines, a ſudden blaſt tooke off his hat, which if it had beene carryed farre, he thinks the peaſants who had perceived it to fall, would have ſworne it had rained hats. After ſome ſuch manner many of our prodigies come to paſſe, and the people are wil-

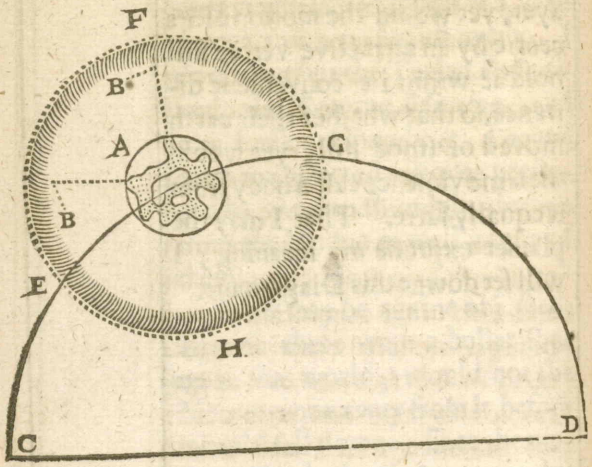
ling to believe any thing, which they may relate to others as a very strange and wonderfull event. I doubt not but the Trojan *Palladium*, the Romane *Minerva*, and our Ladies Church at *Loretto*, with many sacred reliques preserved by the Papists might droppe from the Moone as well as any of these.

But it may be againe objected, suppose there were a bullet shot up in that world, would not the Moone runne away from it, before it could fall downe, since the motion of her body (being every day round our earth) is farre swifter than the other, and so the bullet must be left behinde, and at length fall downe to us? To this I answer,

1. If a bullet could be shot so farre till it came to the circumference of those things which belong to our center, then it would fall downe to us.

2. Though there were some heavy

heavie body a great height in that ayer, yet would the motion of its centre by an attractive vertue still hold it within its convenient distance, so that whether their earth moved or stood still, yet would the same violence cast a body from it equally farre. That I may the plainer expresse my meaning, I will set downe this Diagramme.



Suppoſe this earth were A, which was to move in the circle C,D. and let the bullet be ſuppoſed at B. within its proper verge; I ſay, whether this earth did ſtand ſtil or move ſwiftly towards D, yet the bullet would ſtill keepe at the ſame diſtance by reaſon of that Magneticke vertue of the center (if I may ſo ſpeake) whereby all things within its ſpheare are attracted

tracted with it. So that the violence to the bullet, being nothing elſe but that whereby 'tis removed from its center, therefore an equall violence can carry a body from its proper place, but at an equall diſtance whether or no the center ſtand ſtill or move.

The impartiall Reader may finde ſufficient ſatisfaction for this and ſuch other arguments as may be urged againſt the motion of that earth in the writings of *Capernicus* and his followers, unto whom for brevities ſake I will referre them.

Propoſition 9.

That there are high Mountaines, deepe vallies, and ſpacious plaines in the body of the Moone.

THough there are ſome who thinke Mountaines to bee a deformity in the earth, as if they

were either beate up by the flood, or else cast up like so many heaps of rubbish left at the creation, yet if well considered, they will be found as much to conduce to the beauty and conveniency of the universe as any of the other parts.

Nat. hist. l.36.c.1.

Nature (saith *Pliny*) purposely framed them for many excellent uses: partly to tame the violence of greater Rivers, to strengthen certaine joynts within the veines and bowels of the earth, to breake the force of the Seas inundation, and for the safety of the earths inhabitants, whether beasts or men.

Psal.104. v.18.

That they make much for the protection of beasts the Psalmist testifies, *The highest hils are a refuge for the wilde Goats, and the rockes for Conies.* The Kingly Prophet had learned the safety of these by his owne experience, when he also was faine to make a mountaine his refuge from the fury of his Master *Saul*, who persecuted him in the wilderness.

True

True indeed, ſuch places as theſe keepe their neighbours poore, as beeing moſt barren, but yet they preſerve them ſafe, as being moſt ſtrong, witneſſe our unconquered *Wales* and *Scotland*, whoſe greateſt protection hath beene the naturall ſtrength of their Countrey, ſo fortified with Mountaines, that theſe have alwaies been unto them ſure retraites from the violence and oppreſſion of others, wherefore a good Authour doth rightly call them natures bulwarkes caſt up at God Almighties owne charges, the ſcornes and curbs of victorious armies, which made the Barbarians in *Curtius* ſo confident of their owne ſafety, when they were once retired to an inacceſſible mountaine, that when *Alexanders* Legate had brought them to a parley and perſwading them to yeeld, told them of his maſters victories, what Seas and Wilderneſſes hee had paſſed, they replyed that all that might

be, but could *Alexander* fly too? Over the Sea he might have ships, and over the land horses, but hee must have wings before he could get up thither. Such safety did those barbarous nations conceive in the mountaines whereunto they were retyred, certainely then such usefull parts were not the effect of mans sinne, or produced by the Worlds curse the flood, but rather at the first created by the goodnesse and providence of the Almighty.

So that if I intend to prove that the Moone is such a habitable world as this is, 'tis requisite that I shew it to have the same conveniences of habitation as this hath, and here if some Rabbi or Chymicke were to handle the point they would first prove it out of Scripture, from that place in *Moses* his blessing, where hee speakes of the ancient mountaines and lasting hils, *Deut.* 33

Deut. 33. 15.

הררי קדם וגבעות עולם

for

for having immediately before mentioned those blessings which should happen unto *Ioseph* by the influence of the Moone, he does presently exegetically iterate thē in blessing him with the chiefe things of the ancient Mountaines and lasting hils; you may also see the same expression used in *Iacobs* blessing of *Ioseph*. Gen.49.26

But however we may deale *pro* or *con* in Philosophy, yet we must not jest with divine truths, or bring Scripture to patronize any fancy of our owne, though, perhaps, it be truth. For the better proofe of this proposition, I might here cite the testimony of *Diodorus*, who thought the Moone to bee full of rugged places, *vel ut terrestribus tumulis superciliosam*, but he erred much in some circumstances of this opinion, especially where he saies, there is an Iland amongst the *Hyperboreans*, wherein those hils may to the eye bee plainely discovered, and for this reason

reason. * *Cælius* calls him a fabulous Writer, but you may see more expresse authority for the proofe of this in the opinions of *Anaxagoras* and *Democritus*, who held that this Planet was full of champion grounds, mountains and vallies, and this seemed likewise probable unto *Augustinus Nifus*, whose words are these: *Forsit an non est remotum dicere, lunæ partes esse diversas, veluti sunt partes terræ, quarum aliæ sunt vallosæ, aliæ montosæ, ex quarum differentia effici potest facies illa lunæ; nec est rationi dissonum, nam luna est corpus imperfectè Sphæricum, cum sit corpus ab ultimo cœlo elongatum, ut supra dixit Aristoteles.* Perhaps, "it would not be amisse to say "that the parts of the Moone "were divers, as the parts of this "earth, whereof some are vallies, "and some mountaines, from the "difference of which, some spots "in the Moone may proceed, nor "is this against reason, for that "Planet

* *Lect. aut l. 1. c. 15. Plut. de plac. l. 2. c. 25.*

De cœlo, l. 2. p. 49.

"Planet cannot be perfectly sphe-
"ricall, since 'tis so remote a body
"from the first orbe, as *Aristotle*
"had said before. You may see
this truth assented unto by *Blancanus* the Jesuit, and by him confirmed with divers reasons. *Keplar* hath observed in the Moones eclipses, that the division of her enlightened part from the shaded, was made by a crooked unequall line, of which there cannot be any probable cause conceived, unlesse it did arise from the ruggednesse of that planet, for it cannot at all be produc'd from the shade of any mountains here upon earth, because these would be so lessned before they could reach so high in a conicall shadow, that they would not be at all sensible unto us (as might easily be demonstrated) nor can it be conceived what reason of this difference there should be in the Sunne. Wherefore there being no other body that hath any thing to doe in eclipses, we must necessarily

De Mundi fab. pars 3a. c. 4.

Astron. Opt. c. 6. num. 9.

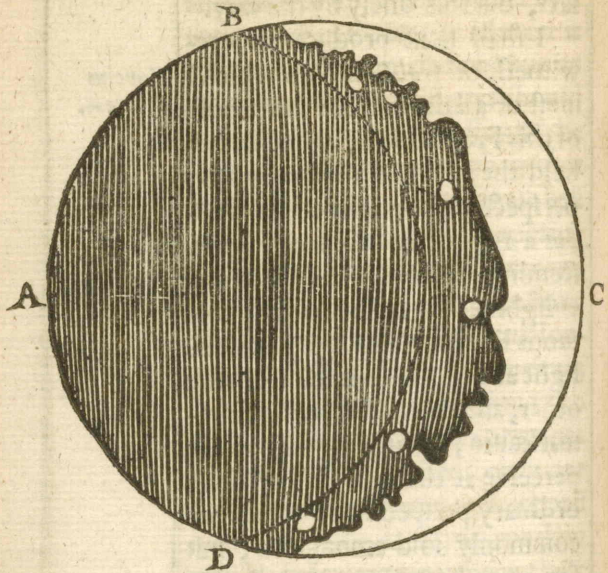
rily conclude, that it is caused by a variety of parts in the Moone it selfe, and what can there be but its gibbosities? Now if you should aske a reason why there should be such a similitude of these in that Planet, the same *Keplar* shall jest you out an answere, for supposing (saith he) those inhabitants are bigger than any of us in the same proportion, as their daies are longer than ours, viz. by fifteen times it may bee for want of stones to erect such vast houses as were requisite for their bodies, they are faine to digge great and round hollowes in the earth, where they may both procure water for their thirst, and turning about with the shade, may avoid those great heats which otherwise they would be lyable unto; or if you will give *Cæsar la Galla* leave to guesse in the same manner, he would rather think that those thirsty nations cast up so many and so great heaps of earth in digging of their wine cellars

lars, but this onely by the way.

I ſhall next produce the eye-witneſſe of *Galilæus*, on which I moſt of all depend for the prooſe of this Propoſition, when he beheld the new Moone through his perſpective, it appeared to him under a rugged and ſpotted figure, ſeeming to have the darker and enlightned parts divided by a tortuous line, having ſome parcels of light at a good diſtance from the other, and this difference is ſo remarkable, that you may eaſily perceive it through one of thoſe ordinary perſpectives, which are commonly ſold amongſt us, but for your better apprehending of what I deliver, I will ſet downe the Figure as I find it in *Galilæus*:

Nuncius Sydereus.

Suppoſe



Suppose ABCD to represent the appearance of the Moones body being in a sextile, you may see some brighter parts separated at a pretty distance from the other, which can bee nothing else but a reflexion of the Sunne-beames upon some parts that are higher then the rest, and those obscure gibbo-

sities

ſities which ſtand out towards the enlightened parts muſt bee ſuch hollow and deepe places whereto the rayes cannot reach, but when the Moone is got further off from the Sunne, and come to that ful-neſſe, as this line BD doth repre-ſent her under, then doe theſe parts alſo receive an equall light, excepting onely that difference which doth appeare betwixt their ſea and land. And if you do conſi-der how any rugged body would appeare, being enlightned, you would eaſily conceive that it muſt neceſſarily ſeeme under ſome ſuch gibbous unequall forme, as the Moone is here repreſented. Now for the infallibility of theſe appea-rances, I ſhall referre the reader to that which hath beene ſaid in the 6th Propoſition.

But *Cæſar la Galla* affirmes, that all theſe appearances may conſiſt with a plaine ſuperficies, if wee ſuppoſe the parts of the body to be ſome of them, *Diaphanous*, and

ſome

some opacous; and if you object that the light which is conveyed to any diaphanous part in a plaine superficies must be by a continued line, whereas here there appeare many brighter parts among the obscure at some distance from the rest. To this he answers, it may arise from some secret conveyances and channels within her body, that doe consist of a more diaphanous matter which being covered over with an opacious superficies, the light passing through them may breake out a great way off, whereas the other parts betwixt may still remaine darke. Just as the River *Arethusa* in *Sicile* which runnes under ground for a great way, and afterwards breakes out againe. But because this is one of the chiefest fancies whereby hee thinkes hee hath fully answered the arguments of this opinion, I will therefore set downe his answere in his owne words, lest the Reader might suspect more in them

them then I have expressed. *Non est impossibile cœcos ductus diaphani & perspicui corporis, sed opacâ superficie protendi, usq; in diaphanam aliquam ex profundo in superficiem, emergentem partem, per quos ductus lumen longo postmodum interstitio erumpat, &c.* But I reply, if the superficies betwixt these two enlightened parts remaine darke because of its opacity, then would it alwaies be darke, and the Sunne could not make it partake of light more then it could of perspicuity: But this contradicts all experience as you may see in *Galilæus*, who affirmes that when the Sunne comes nearer to his opposition, then that which is betwixt them, both is enlightned as well as either. Nay this opposes his owne eye-witnesse, for he confesses himselfe that he saw this by the glasse He had said before that he came to see those strange sights discovered by *Galilæus* his glasse with an intent of contradiction, and you

Cap. 11.

may reade that confirmed in the weakenesse of this answere, which rather bewrayes an obstinate then a perswaded will, for otherwise sure hee would never have undertooke to have destroyed such certaine proofes with so groundlesse a fancy.

But it may bee objected, that 'tis almost impossible, and altogether unlikely that in the Moone there should be any mountaines so high as those observations make them, for doe but suppose according to the common principles, that the Moones diameter unto the Earths is very neere to the proportion of 2. to 7, suppose withall that the Earths diameter containes about 7000 Italian miles, and the Moones 2000 (as is commonly granted) now *Galilæus* hath observed that some parts have been enlightened when they were the twentieth part of the diameter distant from the common terme of illumination, so that hence

hence it must necessarily follow that there may bee some Mountaines in the Moone so high, that they are able to cast a shadow a 100 miles off. An opinion that sounds like a prodigie or a fiction; wherefore 'tis likely that either those appearances are caused by somewhat else besides mountaines, or else those are fallible observations, from whence may follow such improbable inconceiveable consequences.

But to this I answere:

1. You must consider the height of the Mountaines is but very little, if you compare them to the length of their shadowes. Sr. *Walter Rawleigh* observes that the Mount *Athos* now called *Lacas* casts its shadow 300 furlongs, which is above 37 miles, and yet that Mount is none of the highest, nay *Solinus* (whom I should rather believe in this kinde) affirmes that this Mountaine gives his shadow quite over the Sea, from

Hist l.1.c.7. § 11.

Poly.histor. c.21.

Macedon to the Ile of *Lemnos* which is 700 furlongs or 84 miles, and yet according to the common reckoning it doth scarce reach 4 miles upwards, in its perpendicular height.

2. I affirme that there are very high Mountaines in the Moone. *Keplar* and *Galilæus* thinke that they are higher than any which are upon our earth. But I am not of their opinion in this, because I suppose they goe upon a false ground whilst they conceive that the highest mountaine upon the earth is not above a mile perpendicular.

Whereas 'tis the common opinion and found true enough by observation, that *Olympus*, *Atlas*, *Taurus* and *Emus*, with many others are much above this height. *Tenariffa* in the Canary Ilands is proved by computation to bee above 8 miles perpendicular, and about this height is the mount *Perjacaca* in *America*. Sr. *Walter Rawleigh*

Rawleigh seemes to thinke, that the highest of these is neere 30 miles upright: nay *Aristotle* speaking of *Caucasus* in *Asia*, affirmes it to bee visible for 560 miles, as some interpreters finde by computation, from which it will follow, that it was 78 miles perpendicularly high, as you may see confirmed by *Jacobus Mazonius*, and out of him in *Blancanus* the Jesuite. But this deviates from the truth more in excesse then the other doth in defect. However though these in the moone are not so high as some amongst us, yet certaine it is they are of a great height, and some of them at the least foure miles perpendicular. This I shall prove from the observation of *Galilaus*, whose glasse can shew this truth to the senses, a proofe beyond exception and certaine that man must needs be of a most timerous faith who dares not believe his owne eye.

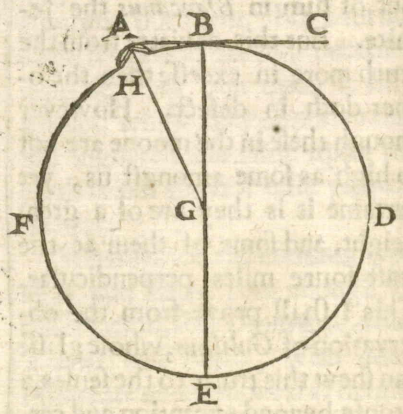
Meteor. l. 1. c. 11.

Comparatio Arist. cum Platone, Sect. 3. c. 5.

Expos. in loc. Math. Arlis. loc. 148.

By that perspective you may

plainely discerne some enlightned parts (which are the mountaines) to be distant from the other about the twentieth part of the diameter. From whence it will follow, that those mountaines must necessarily be at the least foure Italian miles in height.



For let B D E F be the body of the moone, A B C will be a ray or beame of the Sunne, which enlightens a mountaine at A and B is

B is the point of contingency, the distance betwixt A and B must bee supposed to be the twentieth part of the diameter which is an 100 miles, for so far are some enlightened parts severed from the common terme of illumination. Now the aggregate of the quadrate from A *B* a hundred, and *B G* a 1000 will bee 1010000, unto which the quadrate arising from A G must be equall according to the 47th proposition in the first booke of elements. Therefore the whole line *A G* is somewhat more than 104, and the distance betwixt H A must be above 4 miles, which was the thing to be proved.

But it may be againe objected, if there be such rugged parts, and so high mountaines, why then cannot wee discerne them at this distance, why doth the moone appeare unto us so exactly round, and not rather as a wheele with teeth?

I answere, by reason of too great a distance, for if the whole body appeare to our eye so little, then those parts which beare so small a proportion to the whole will not at all be sensible.

But it may be replied, if there were any such remarkeable hils, why does not the limbe of the moone appeare like a wheele with teeth to those who looke upon it through the great perspective on whose witnesse you so much depend? or what reason is there that she appeares as exactly round through it as shee doth to the bare eye? certainely then either there is no such thing as you imagine, or else the glasse failes much in this discovery.

To this I shall answere out of *Galilæus*.

1. You must know that there is not meerely one ranke of mountaines about the edge of the moone, but divers orders, one mountaine behind another, and so

ſo there is ſomewhat to hinder thoſe void ſpaces which otherwiſe, perhaps, might appeare.

Now where there be many hils, the ground ſeemes even to a man that can ſee the tops of all. Thus when the ſea rages, and many vaſt waves are lifted up, yet all may appeare plaine enough to one that ſtands at the ſhore. So where there are ſo many hils, the inequality will be leſſe remarkable, if it be diſcerned at a diſtance.

2. Though there be mountains in that part which appeares unto us, to be the limbe of the Moone, as well as in any other place, yet the bright vapours hide their appearance: for there is an orbe of thicke vaporous aire that doth immediatly compaſſe the body of the Moone, which though it have not ſo great opacity, as to terminate the ſight, yet being once enlightened by the Sunne, it doth repreſent the body of the Moone under a greater forme, and hinders

our

our sight from a distinct view of her true circumference. But of this in the next Chapter.

I have now sufficiently proved, that there are hills in the Moone, and hence it may seeme likely that there is also a world, for since providence hath some speciall end in all its workes, certainly then these mountaines were not produced in vaine, and what more probable meaning can wee conceive there should be, than to make that place convenient for habitation.

Proposition 8

That there is an Atmo-sphæra, or an orbe of grosse vaporous aire, immediately encompassing the body of the Moone.

AS that part of our aire which is neerest to the earth, is of a thicker substance than the other, by reason tis alwaies mixed with some

ſome vapours, which are continually exhaled into it. So is it equally requiſite, that if there be a world in the Moone, that the aire about that ſhould be alike qualified with ours. Now, that there is ſuch an orbe of groſſe aire, was firſt of all (for ought I can reade) obſerved by *Meſlin*, afterwards aſſented unto by *Keplar* and *Galilæus*, and ſince by *Baptiſta Ciſatus*, *Sheiner* with others, all of them confirming it by the ſame arguments which I ſhall onely cite, and then leave this Propoſition.

Vide Euſeb. Nierem. *de Nat. Hiſt. l. 2. c. 11.*

1. 'Tis obſerved, that ſo much of the Moone as is enlightened, is alwaies part of a bigger circle then that which is darker. Their frequent experience hath proved this, and an eaſie obſervation may quickely confirme it. But now this cannot proceede from any other cauſe ſo probable, as from this orbe of aire, eſpecially when we conſider how that planet ſhining with a borrowed light, doth not

ſend

ſend forth any ſuch rayes as may make her appearance bigger then her body.

2. 'Tis obſerved in the Solary eclipſes, that there is a great trepidation about the body of the Moone, from which we may likewiſe argue an Atmo-ſphæra, ſince we cannot well conceive what ſo probable a cauſe there ſhould be of ſuch an appearance as this, *Quod radii Solares à vaporibus Lunam ambientibus fuerint interciſi*, that the Sun beames were broken and refracted by the vapours that encompaſſed the Moone.

Scheiner. Roſ. Viſ. l. 4. pars 2. c. 27.

3. I may adde the like argument taken from another obſervation which will be eaſily tried and granted. When the Sunne is eclipſed, wee diſcerne the Moone as ſhee is in her owne naturall bigneſſe, but then ſhe appeares ſomewhat leſſe then when ſhee is in the full, though ſhe be in the ſame place of her ſuppoſed excentrick and epicycle, and therefore *Tycho* hath

hath calculated a Table for the Diameter of the divers new Moones. But now there is no reason so probable to salve this appearance, as to place an orbe of thicker aire, neere the body of that Planet, which may be enlightened by the reflected beames, and through which the direct raies may easily penetrate.

But some may object that this will not consist with that which was before delivered, where I said, that the thinnest parts had least light.

If this were true, how comes it to passe then, that this aire should be as bright as any of the other parts, when as tis the thinnest of all?

I answer, if the light be received by reflection, then the thickest body hath most, because it is best able to beate backe the raies, but if the light be received by illumination (especially if there be an opacous body behinde, which

Hist. l. 1. c. 7. § 11.

which may double the beames by reflexion) as it is here, then I deny not but a thinne body may retaine much light, and perhaps, some of those appearances which wee take for fiery comets, are nothing else but a bright cloud enlightened, so that probable it is, there may be such aire without the Moone, and hence it comes to passe, that the greater spots are onely visible towards her middle parts, and none neere the circumference, not but that there are some as well in those parts as else where, but they are not there perceiveable, by reason of those brighter vapours which hide them.

Proposition

Propoſition 11.

That as their world is our Moone, ſo our world is their Moone.

I Have already handled the firſt thing that I promiſed according to the Method which *Ariſtotle* uſes in his Booke *de Mundo*, and ſhew'd you the neceſſary parts that belong to this world in the Moone. In the next place 'tis requiſite that I proceed to thoſe things which are extrinſecall unto it, as the Seaſons, the Meteors, and the Inhabitants.

1. Of the Seaſons;

And if there be ſuch a world in the Moone, 'tis requiſite then that their ſeaſons ſhould be ſome way correſpondent unto ours, that they ſhould have Winter and Summer, night and day, as wee have.

Now that in this Planet there is ſome ſimilitude of Winter and Sum-

De gen. animal. l.4.12.

Summer is affirmed by *Aristotle* himselfe, since there is one hemispheare that hath alwaies heate and light, and the other that hath darknesse and cold. True indeed, their daies and yeeres are alwaies of one and the same length, but tis so with us also under the Poles, and therefore that great difference is not sufficient to make it altogether unlike ours, nor can we expect that every thing there should be in the same manner as it is here below, as if nature had no way but one to bring about her purposes. Wee may easily see what great differences there are amongst us, betwixt things of the same kinde. Some men (say they) there are, who can live onely upon smells, without eating any thing, and the same Plant, saith *Besoldus*, hath sometimes contrary effects. *Mandragora* which growes in *Syria*, inflames the lust, wheras *Mandragora* which grows in other places doth coole the blood & quench lust.

Plat. de fac. De naturâ populorum. c. 3.

Now

Now if with us there be ſuch great difference betwixt things of the ſame kinde, we have no reaſon then to thinke it neceſſary that both theſe worlds ſhould be altogether alike, but it may ſuffice if they bee correſpondent in ſomething onely, however it may be queſtioned whether it doth not ſeeme to be againſt the wiſedome of providence, to make the night of ſo great a length, when they have ſuch a long time unfit for worke? I anſwere no, ſince tis ſo, and more with us alſo under the poles; and beſides, the generall length of their night is ſomewhat abated in the bigneſſe of their Moone which is our earth. For this returnes as great a light unto that Planet, as it receives from it. But for the better proofe of this, I ſhall firſt free the way from ſuch opinions as might otherwiſe hinder the ſpeede of a clearer progreſſe.

Plutarch one of the chiefe patrons *Plut. de fac. lunæ.*

trons of this world in theMoone, doth directly contradict this proposition; affirming, that those who live there may discerne our world as the dregges and sediment of all other creatures, appearing to them through clouds and foggy mists, and that altogether devoid of light, being base and unmoveable, so that they might well imagine the darke place of damnation to be here situate, and that they onely were the inhabiters of the world, as being in the midst betwixt Heaven and Hell.

To this I may answere, 'tis probable that *Plutarch* spake this inconsiderately, and without a reason, which makes him likewise fall into another absurditie, when he sayes our earth would appeare immoveable, whereas questionlesse though it did not, yet would it seeme to move, and theirs to stand still, as the Land doth to a man in a Shippe; according to that

that of the Poet :

Provehimur portu, terræq; urbesq; recedunt.

And I doubt not but that ingenuous Authour would easily have recanted if hee had beene but acquainted with those experiences which men of latter times have found out, for the confirmation of this truth.

2. Unto him assents *Macrobius*, whose words are these ; *Terra accepto solis lumine clarescit, tantummodò, non relucet.* "The earth "is by the Sunne-beames made "bright, but not able to enlighten "any thing so farre. And his reason is, because this being of a thicke and grosse matter, the light is terminated in its superficies, and cannot penetrate into the substance; whereas the moone doth therefore seeme so bright to us, because it receives the beames within it selfe. But the weaknesse of this assertion, may bee easily manifest by a common experience,

for polished steele (whose opacity will not give any admittance to the rayes) reflects a stronger heate then glasse, and so consequently a greater light.

3. 'Tis the generall consent of Philosophers, that the reflection of the Sunne-beames from the earth doth not reach much above halfe a mile high, where they terminate the first region, so that to affirme they might ascend to the moone, were to say, there were but one region of aier, which contradicts the proved and received opinion.

Unto this it may be answered:

That it is indeed the common consent, that the reflexion of the Sunne-beames reach onely to the second region, but yet some there are, and those too Philosophers of good note, who thought otherwise. Thus *Plotinus* is cited by *Calius*, *Si concipias te in sublimi quopiam mundi loco, unde oculis subjiciatur terræ moles aquis circumsufa-*

Ant. lect. l. 1. c. 4.

eumfusa, & ſolis ſyderumq; radiis illuſtrata, non alium profecto viſam iri probabile eſt, quam qualis modo viſatur lunaris globi ſpecies. "If "you did conceive your ſelfe to "bee in ſome ſuch high place, "where you might diſcerne the "whole Globe of the earth and "water, when it was enlightned "by the Sunnes rayes, 'tis probable "it would then appeare to you in "the ſame ſhape as the moone "doth now unto us. Thus alſo *Carolus Malapertius*, whoſe words are theſe, *Terra hæc noſtra ſi in luna conſtituti eſſemus, ſplendida prorſus quaſi non ignobilis planeta, nobis appareret.* "If wee "were placed in the moone, and "from thence beheld this our "earth, it would appeare unto us "very bright, like one of the "nobler Planets. Unto theſe doth *Fromondus* aſſent, when he ſayes, *Credo equidem quod ſi oculus quiſpiam in orbe lunari foret, globum terræ & aquæ inſtar ingentis ſyderis*

Præfat. ad Auſtrica ſyd.

Meteor. l. 1. c. 2. Art. 2.

à sole illustrem conspiceret. " I " believe that this globe of earth " and water would appeare like " some great Starre to any one, " who should looke upon it from " the moone. Now this could not be, nor could it shine so remarkably, unlesse the beames of light, were reflected from it. And therefore the same *Fromondus* expressly holds, that the first region of ayre is there terminated, where the heate caused by reflexion begins to languish, whereas the beames themselves doe passe a great way further. The chiefe argument which doth most plainely manifest this truth, is taken from a common observation which may be easily tryed.

If you behold the Moone a little before or after the conjunction, when she is in a sextile with the Sunne, you may discerne not onely the part which is enlightned, but the rest also to have in it a kind of a duskish light, but if you chuse

chuſe out ſuch a ſituation, where ſome houſe or chimney (being ſome 70 or 80 paces diſtant from you) may hide from your eye the enlightned hornes, you may then diſcerne a greater and more remarkeable ſhining in thoſe parts unto which the Sunne beames cannot reach; nay there is ſo great a light, that by the helpe of a good perſpective you may diſcerne its ſpots. In ſo much that *Blancanus* the Jeſuite ſpeaking of it ſayes, *Hæc experientia ita me aliquando fefellit, ut in hunc fulgorem caſu ac repente incidens, exiſtimarim novo quodam miraculo tempore adoleſcentis lunæ factum eſſe plenilunium.* "This experiment "did once ſo deceive mee, that "happening upon the ſight of this "brightneſſe upon a ſudden, I "thought that by ſome new mi-"racle the Moone had beene got "into her full a little after her "change.

De mundi fab. p. 3. c. 3.

But now this light is not proper

to the Moone, it doth not proceed from the rayes of the Sunne which doth penetrate her body, nor is it caused by any other of the Planets and Starres. Therefore it must necessarily follow, that it comes from the earth. The two first of these I have already proved, and as for the last, it is confidently affirmed by *Cælius*, *Quod si in disquisitionem evocet quis, an lunari syderi lucem fœnerent planetæ item alii, asseveranter astruendum non fœnerare.* "If any should aske "whether the other Planets lend "any light to the Moone; I answer "they doe not. True indeed, the noble *Tycho* discussing the reason of this light attributes it to the Planet *Venus*, and I grant that this may convey some light to the Moone, but that it is not the cause of this whereof wee now discourse, is of it selfe sufficiently plaine, because *Venus* is some imes over the Moone, when as shee cannot convey any light to that part

Progym. 1.

l. 20. c. 5.

part which is turned from her.

It doth not proceede from the fixed ſtarres, for then it would retaine the ſame light in eclipſes, whereas the light at ſuch times is more ruddy and dull. Then alſo the light of the Moone would not be greater or leſſer, according to its diſtance from the edge of the earths ſhadow, ſince it did at all times equally participate this light of the ſtarres.

Now becauſe there is no other body in the whole Univerſe, ſave the earth, it remaines that this light muſt neceſſarily be cauſed by that which with a juſt gratitude repaies to the Moone, ſuch illumination as it receives from her.

And as loving friends equally participate of the ſame joy and griefe, ſo doe theſe mutually partake of the ſame light from the Sunne, and the ſame darkeneſſe from the eclipſes, being alſo ſeverally helped by one another in

their

their greatest wants: For when the Moone is in conjunction with the Sunne, and her upper part receives all the light, then her lower Hemispheare (which would otherwise be altogether darke) is enlightened by the reflexion of the Sunne beames from the earth. When these two planets are in opposition, then that part of the earth which could not receive any light from the Sunne beames, is most enlightened by the Moone, being then in her full; and as she doth most illuminate the earth when the Sunne beames cannot, so the gratefull earth returnes to her as great, nay greater light when shee most wants it; so that alwaies that visible part of the Moone which receives nothing from the Sunne, is enlightened by the earth, as is proved by *Galilæus*, with many more arguments, in that Treatise which he calls *Systema mundi*. True indeed, when the Moone comes to a quartile, then you

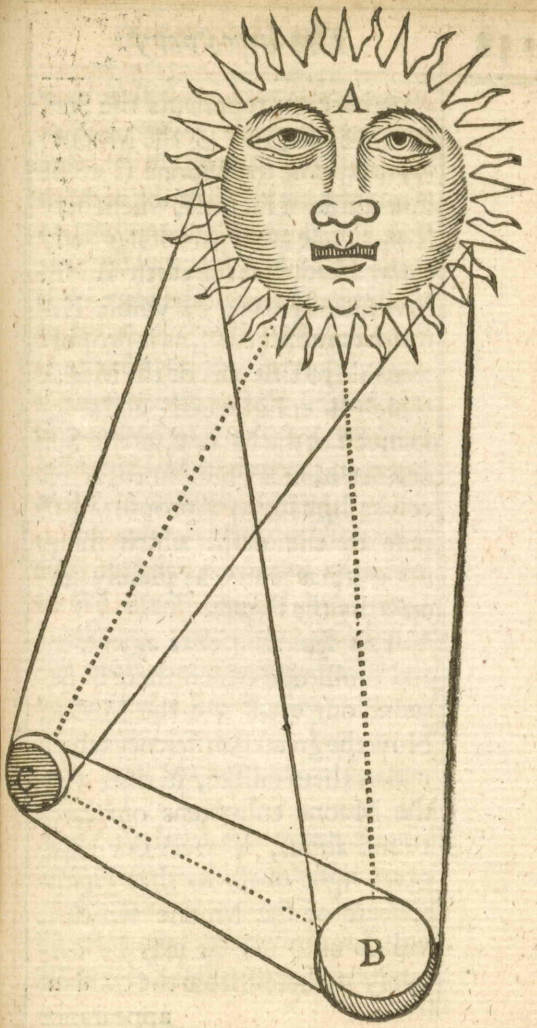
you can neither discerne this light, nor yet the darker part of her body, but the reason is, because of the exuperancy of the light in the other parts. *Quippe illustratum medium speciem recipit valentiorem*, the clearer brightnesse involves the weaker, it being with the species of sight, as it is with those of sound, and as the greater noise drownes the lesse, so the brighter object hides that which is more obscure. But they doe alwaies in their mutuall vicissitudes participate of one anothers light; so also doe they partake of the same defects and darknings, for when our Moone is eclipsed, then is their Sunne darkened, and when our Sunne is eclipsed, then is their Moone deprived of its light, as you may see affirmed by *Mæslin*. *Quod si terram nobis ex alto liceret intueri, quemadmodum deficientem lunam ex longinquo spectare possumus, videremus tempore eclipsis solis terræ aliquam*

Scal exerc. 62.

Epit. Astro. l.4. part.2.

aliquam partem lumine solis deficere, eodem plane modo sicut ex opposito luna deficit, "If wee "might behold this globe of earth "at the same distance as we doe "the Moone in her defects, wee "might discerne some part of it "darkened in the Sunnes eclip-"ses, just so as the Moone is "in hers. For as our Moone is eclipsed by the interposition of our earth, so is their Moone eclipsed by the interposition of theirs. The manner of this mutuall illumination betwixt these two you may plainly discerne in this Figure following.

Where


A
B
C

Where A represents the Sun, B the Earth, and C the Moone; Now suppose the Moone C to be in a sextile of increase, when there is onely one small part of her body enlightened, then the earth B will have such a part of its visible Hemispheare darkened, as is proportionable to that part of the Moone which is enlightened; and as for so much of the Moone, as the Sun beames cannot reach unto, it receives light from a proportionall part of the earth which shines upon it, as you may plainly perceive by the Figure.

You see then that agreement and similitude which there is betwixt our earth and the Moone. Now the greatest difference which makes them unlike, is this, that the Moone enlightens our earth round about, whereas our earth gives light onely to that Hemispheare of the Moone which is visible unto us, as may be certainly gathered from the constant

appearance

appearance of the ſame ſpots, which could not thus come to paſſe, if the Moone had ſuch a diurnall motion about its own axis, as perhaps our earth hath. And though ſome ſuppoſe her to move in an epicycle, yet this doth not ſo turne her body round, that we may diſcerne both Hemiſpheares, for according to that hypotheſis, the motion of her eccentrick, doth turne her face towards us, as much as the other doth from us.

But now if any queſtion what they doe for a Moone who live in the upper part of her body? I anſwer, the ſolving of this is the moſt uncertaine and difficult thing that I know of concerning this whole matter. But yet I will give you two probable conjectures.

1. Perhaps, the upper Hemiſpheare of the Moone doth receive a ſufficient light from thoſe planets about it, and amongſt theſe *Venus* (it may be) beſtowes a more eſpeciall

ciall brightnesse, since *Galilæus* hath plainly discerned that she suffers the same increases and decreases, as the Moone hath, and 'tis probable that this may be perceived there without the help of a glasse, because they are farre neerer it than wee. When *Venus* (saith *Keplar*) lies downe in the Perige or lower part of her supposed Epicycle, then is she in conjunction with her husband the Sunne, from whom after she hath departed for the space of ten moneths, shee gets *plenum uterum*, and is in the full.

But you'll reply, though *Venus* may bestow some light when she is over the Moone, and in conjunction, yet being in opposition, she is not visible to them, and what shall they then doe for light?

I answer, then they have none: nor doth this make so great a difference betwixt those two Hemispheares as there is with us, betwixt the places under the poles, and

and the line, but if this bee not ſufficient, then I ſay in the ſecond place that

2. Perhaps there may be ſome other enlightned body above the Moone which we cannot diſcerne, nor is this altogether improbable becauſe there is almoſt the like obſerved in Saturne, who appeares through this glaſſe with two leſſer bodies on each ſide, which may ſupply the office of Moones, unto each hemiſpheare thus:

o O o

So in this world alſo there may be ſome ſuch body, though wee cannot diſcerne it, becauſe the Moone is alwaies in a ſtreight line, betwixt our eye and that. Nor is it altogether unlikely that there ſhould bee more moones to one Orbe, becauſe *Jupiter* alſo is obſerved to have foure ſuch

bodies that move round about him.

But it may seeme a very difficult thing to conceive, how so grosse and darke a body as our earth, should yeeld such a cleare light as proceedes from the Moone, and therefore the Cardinall *de Cusa* (who thinkes every Starre to be a severall world) is of opinion that the light of the Sunne is not able to make them appeare so bright, but the reason of their shining is, because wee behold them at a great distance through their regions of fire which doe set a shining lustre upon those bodies that of themselves are darke. *Vnde si quis esset extra regionem ignis, terra ista in circumferentia sua regionis per medium ignis lucida stella appareret.* "So that if a "man were beyond the region of "fire, this earth would appeare "through that as a bright Starre. But if this were the onely reason then would the Moone bee freed

De docta ig. l.2. c.12.

freed from ſuch increaſes and decreaſes as ſhee is now lyable unto.

Keplar thinkes that our earth receives that light whereby it ſhines from the Sunne, but this (ſaith he) is not ſuch an intended cleare brightneſſe as the Moone is capable of, and therefore hee gueſſes, that the earth there is of a more chokie ſoyle like the Ile of *Creete*, and ſo is better able to reflect a ſtronger light, whereas our earth muſt ſupply this intention with the quantity of its body, but this I conceive to be a needleſſe conjecture, ſince our earth if all things were well conſidered, will be found able enough to reflect as great a light. For

1. Conſider its opacity, if you marke theſe ſublunary things, you ſhall perceive that amongſt them, thoſe that are moſt perſpicuous, are not ſo well able to reverberate the Sunne beames as the thicker bodies. The rayes paſſe ſingly

through a diaphanous matter, but in an opacous substance they are doubled in their returne and multiplyed by reflexion. Now if the moone and the other Planets can shine so clearely by beating backe the Sunne beames, why may not the earth also shine as well, which agrees with them in the cause of this brightnesse their opacity?

2. Consider what a cleare light wee may discerne reflected from the earth in the middest of Summer, and withall conceive how much greater that must bee which is under the line, where the rayes are more directly and strongly reverberated.

3. Consider the great distance at which wee behold the Planets, for this must needs adde much to their shining and therefore *Cusanus* (in the above cited place) thinkes that if a man were in the Sunne, that Planet would not appeare so bright to him, as now it

it doth to us, because then his eye could discerne but little, whereas here wee may comprehend the beames as they are contracted in a narrow body. *Keplar* beholding the earth from a high mountaine when it was enlightned by the Sunne confesses that it appeared unto him of an incredible brightnesse, whereas then the reflected rayes entered into his sight obliquely; but how much brighter would it have appeared if hee might in a direct line behold the whole globe of earth and these rayes gathered together? So that if wee consider that great light which the earth receives from the Sunne in the Summer, and then suppose wee were in the Moone, where wee might see the whole earth hanging in those vast spaces where there is nothing to terminate the sight, but those beames which are there contracted into a little compasse; I say, if wee doe well consider this, wee may easily

conceive, that our earth appeares a bright to those other inhabitants in the Moone, as theirs doth to us.

Proposition 12.

That tis probable there may bee such Meteors belonging to that world in the Moone, as there are with us.

PLutarch discussing this point affirmes that it is not necessary there should be the same meanes of growth and fructifying in both these worlds, since nature might in her policy finde out more waies then one how to bring about the same effect. But however he thinks its probable that the Moone her selfe sendeth forth warme winds, and by the swiftnesse of her motion there should breathe out a sweet and comfortable ayer, pleasant dewes and gentle moysture, which

which might ſerve for the refreſhing and nouriſhment of the inhabitants and plants in that other world.

But ſince they have all things alike with us, as ſea and land, and vaporous ayer encompaſſing both, I ſhould rather therefore thinke that nature there ſhould uſe the ſame way of producing meteors as ſhe doth with us (and not by a motion as *Plutarch* ſuppoſes) becauſe ſhee doth not love to vary from her uſuall operations without ſome extraordinary impediment, but ſtill keepes her beaten path unleſſe ſhe be driven thence.

One argument whereby I ſhall manifeſt this truth, may be taken from thoſe new Starres wh ch have appeared in divers ages of the world, and by their parallax have beene diſcerned to have been above the *Moone*, ſuch as was that in *Caſſiopeia*, that in *Sagittarius*, with many others betwixt the Planets. *Hipparchus* in his time

Plin.nat.hist. l.2, c.26.

looke especiall notice of such as these, and therefore fancied out such constellations in which to place the Starres, shewing how many there were in every asterisme, that so afterwards posterity might know, whether there were any new Starre produced or any old one missing. Now the nature of these Comets may probably manifest, that in this other world there are other meteors also; for these in all likelihood are nothing else but such evaporations caused by the Sunne, from the bodies of the Planets. I shall prove this by shewing the improbabilities and inconveniences of any other opinion.

For the better pursuite of this 'tis in the first place requisite that I deale with our chiefe adversary, *Cæsar la Galla*, who doth most directly oppose that truth which is here to bee proved. Hee endeavouring to confirme the incorruptibility of the Heavens, and

and being there to satisfie the argument which is taken from these comers, He answers it thus: *Aut argumentum desumptum ex paralaxi non est efficax, aut si est efficax, eorum instrumentorum usum decipere, vel ratione astri vel medii, vel distantiæ, aut ergo erat in suprema parte aeris, aut si in cœlo, tum forsan factum erat ex reflectione radiorum Saturni & Jovis, qui tunc in conjunctione fuerant.* "Either "the argument from the paralax "is not efficacious, or if it be, yet "the use of the instruments might "deceive either in regard of the "starre or the *medium*, or the di-"stance, and so this comet might "be in the upper regions of the "aire, or if it were in the heavens, "there it might be produced by "the reflexion of the rayes from "*Saturne* and *Jupiter*, who were "then in conjunction. You see what shifts hee is driven to, how he runnes up and downe to many starting holes, that hee may find some

some shelter, and in stead of the strength of reason, he answers with a multitude of words, thinking (as the Proverbe is) that hee may use haile, when hee hath no thunder, *Nihil turpius* (saith * *Seneca*) *dubio est incerto, pedem modo referente, modo producente.* "What "can there bee more unseemely "in one that should be a faire "disputant, then to be now here, "now there, and so uncertaine, "that one cannot tell where to "find him. He thinkes that there are not Comets in the heavens, because there may be many other reasons of such appearances, but what he knowes not, perhaps (he saies) that argument from the parallax is not sufficient, or if it be, then there may be some deceit in the observation. To this I may safely say, that hee may justly be accounted a weake Mathematician who mistrusts the strength of this argument, nor can hee know much in Astronomy, who understands

* Epist. 95.

ſtands not the parallax, which is the foundation of that Science, and I am ſure that hee is a timorous man, who dares not believe the frequent experience of his ſenſes, or truſt to a demonſtration.

True indeed, I grant tis poſſible, that the eye, the *medium*, and the diſtance may al deceive the beholder, but I would have him ſhew which of all theſe was likely to cauſe an error in this obſervation? Meerely to ſay they might be deceived is no ſufficient anſwer, for by this I might confute the poſitions of all Aſtronomers, and affirme the ſtarres are hard by us, becauſe 'tis poſſible they may be deceived in their obſerving that diſtance. But I forbeare any further reply; my opinion is of that Treatiſe, that either it was ſet forth purpoſely to tempt a confutation, that hee might ſee the opinion of *Galilæus* confirmed by others, or elſe it was invented with as much haſte and negligence as it was printed, there be-

being in it almost as many faults as lines.

Others thinke that these are not any new Comets, but some ancient starres that were there before, which now shine with that unusuall brightnesse, by reason of the interposition of such vapors which doe multiply their light, and so the alteration will be here onely, and not in the heavens. Thus *Aristotle* thought the appearance of the milkie way was produced, for he held that there were many little starres, which by their influence did constantly attract such a vapour towards that place of heaven, so that it alwaies appeared white. Now by the same reason may a brighter vapor be the cause of these appearances.

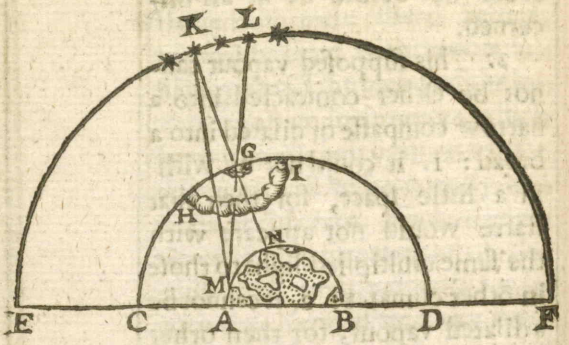
But how probable soever this opinion may seeme, yet if well considered, you shall finde it to be altogether absurd and impossible: for,

1. These starres were never seene

ſeene there before, and tis not likely that a vapour being hard by us can ſo multiply that light which could not before be at all diſcerned.

2. This ſuppoſed vapour cannot be either contracted into a narrow compaſſe or dilated into a broad: 1. it could not be within a little ſpace, for then that ſtarre would not appeare with the ſame multiplied light to thoſe in other climates: 2. it cannot be a dilated vapour, for then other ſtarres which were diſcerned through the ſame vapour would ſeeme as bigg as that; this argument is the ſame in effect with that of the paralax, as you may ſee in this Figure.

Suppoſe



Suppose A B to be a Hemispheare of one earth, C D to be the upper part of the highest region, in which there might be either a contracted vapour, as G, or else a dilated one, as H I. Suppose E F likewise to represent halfe the heavens, wherein was this appearing Comet at K. Now I say, that a contracted vapour, as G could not cause this appearance, because an inhabitant at M could not discerne the same starre with

with this brightneſſe, but perhaps another at L, betwixt which the vapour is directly interpoſed. Nor could it be cauſed by a dilated vapour, as H I, becauſe then all the ſtarres that were diſcerned through it would be perceived with the ſame brightneſſe.

Tis neceſſary therefore that the cauſe of this appearance ſhould be in the heavens. And this is granted by the moſt and beſt Aſtronomers. But, ſay ſome, this doth not argue any naturall alteration in thoſe purer bodies, ſince tis probable that the concourſe of many little vagabond ſtarres by the union of their beames may cauſe ſo great a light. Of this opinion were *Anaxagoras* and *Zeno* amongſt the ancient, and *Baptiſta Ciſatus*, *Blancanus*, with others amongſt our moderne Aſtronomers. For, ſay they, when there happens to be a concourſe of ſome few ſtarres, then doe many other flie unto them from all the parts of heaven

like

like so many Bees unto their King. But 1. tis not likely that amongst those which wee count the fixed starres there should be any such uncertaine motions, that they can wander from all parts of the heavens, as if Nature had neglected them, or forgot to appoint them a determinate course. 2. If there be such a conflux of these, as of Bees to their King, then what reason is there that they doe not still tarry with it, that so the Comet may not be dissolved? But enough of this. You may commonly see it confuted by many other arguments. Others there are, who affirme these to be some new created stars, produced by an extraordinary supernaturall power. I answer, true indeed, tis possible they might be so, but however tis not likely they were so, since such appearances may be salved some other way, wherefore to fly unto a miracle for such things, were a great injury to nature, and to derogate from

from her skill, an indignitie much mis-becomming a man who professes himselfe to be a Philosopher, *Miraculum* (saith one) *est ignorantiæ Asylum*, a miracle often serves for the receptacle of a lazy ignorance which any industrious Spirit would be ashamed of, it being but an idle way to shift off the labour of any further search. But here's the misery of it, wee first tie our selves unto *Aristotles* Principles, and then conclude, that nothing could contradict them but a miracle, whereas 'twould be much better for the Common-wealth of learning, if we would ground our Principles rather upon the frequent experiences of our owne, then the bare authority of others.

Some there are, who thinke that these Comets are nothing else, but exhalations from our earth, carried up into the higher parts of the Heaven. So *Peno*,

Tycho Progym. l. 1. cap. 9.

Rothmannus & Galilæus, but this is not possible, since by computation 'tis found that one of them is above 300 times bigger than the whole Globe of Land and Water. Others therefore have thought that they did proceed from the body of the Sun, and that that Planet onely is *Cometarum officina, unde tanquam emissarii & exploratores emitterentur, brevi ad solem redituri:* The shop or forge of Comets from whence they were sent, like so many spies, that they might in some short space returne againe, but this cannot be, since if so much matter had proceeded from him alone, it would have made a sensible diminution in his body. The Noble *Tycho* therefore thinkes that they consist of some such fluider parts of the Heaven, as the milkie way is framed of, which being condenst together, yet not attaining to the consistency of a Starre, is in some

ſome ſpace of time rarified againe into its wonted nature. But this is not likely, for if there had beene ſo great a condenſation as to make them ſhine ſo bright, and laſt ſo long, they would then ſenſibly have moved downewards towards ſome center of gravity, becauſe whatſoever is condenſt muſt neceſſarily grow heavier, whereas theſe rather ſeemed to aſcend higher, as they laſted longer. But ſome may object, that a thing may be of the ſame weight, when it is rarified, as it had while it was condenſt: ſo metalls, when they are melted, and when they are cold: ſo water alſo when it is frozen, and when it is fluid, doth not differ in reſpect of gravity. But to theſe I anſwer: Firſt, Metalls are not rarified by melting, but molified. Secondly, waters are not properly condenſed, but congealed into a harder ſubſtance, the parts being not

contracted closer together, but still possessing the same extension.

And beside, what likely cause can we conceive of this condensation, unlesse there be such qualities there, as there are in our ayre, and then why may not the Planets have the like qualities, as our earth? and if so, then 'tis more probable that they are made by the ordinary way of nature, as they are with us, and consist of exhalations from the bodies of the Planets. Nor is this a singular opinion; but it seemed most likely to *Camillus Gloriosus. Th. Campanella, Fromondus*, with some others. But if you aske whither all these exhalations shall returne, I answer, every one into his owne Planet: if it be againe objected, that then there will be so many centers of gravity, and each severall Planet will be a distinct world; I reply, perhaps all of them are so

De Comet. l. 5. c. 4. Apolog. Meteor. l. 3. c. 2. Art. 6.

Iohan. Fabr. Carolus Malaptius de Heliocyc. Scheiner. Rosa Vrsina.

ſo except the Sunne, though *Cuſanus* thinkes there is one alſo, and later times have diſcovered ſome leſſer Planets moving round about him. But as for *Saturne*, he hath two Moones on each ſide. *Jupiter* hath foure, that incircle his body with their motion. *Venus* is obſerved to increaſe and decreaſe as the Moone. *Mars*, and all the reſt, derive their light from the Sunne onely. Concerning *Mercury*, there hath beene little or no obſervation, becauſe for the moſt part, he lies hid under the Sunne beames, and ſeldome appeares by himſelfe. So that if you conſider their quantity, their opacity, or theſe other diſcoveries, you ſhall finde it probable enough, that each of them may be a ſeverall world. But this would be too much for to vent at the firſt. the chiefe thing at which I now ayme in this diſcourſe, is to

prove that there may be one in the Moone.

It hath beene before confirmed that there was a spheare of thicke vaporous aire encompasing the Moone, as the first and second regions doe this earth. I have now shewed, that thence such exhalations may proceede as doe produce the Comets: now from hence it may probably follow, that there may be wind also and raine, with such other Meteors as are common amongst us. This consequence is so dependant, that *Fromondus* dares not deny it, though hee would (as hee confesses himselfe) for if the Sunne be able to exhale from them such fumes as may cause Comets, why not then such as may cause winds, and why not such also as cause raine, since I have above shewed, that there is Sea and Land as with us. Now raine seemes to be more especially requisite for them, since

De meteor. l. 3. c. 2. Art. 6.

ſince it may allay the heate and ſcorchings of the Sunne, when he is over their heads. And nature hath thus provided for thoſe in *Peru*, with the other inhabitants under the line.

But if there be ſuch great, and frequent alterations in the Heavens, why cannot wee diſcerne them?

I anſwer:

1. There may be ſuch, and we not able to perceive them, becauſe of the weakneſſe of our eye, and the diſtance of thoſe places from us, they are the words of *Fienus*, as they are quoted by *Fromondus* in the above cited place) *Poſſunt maximæ permutationes in cœlo fieri, etiamſi a nobis non conſpiciantur, hoc viſus noſtri debilitas & immenſa cœli diſtantia faciunt.* And unto him aſſents *Fromondus* himſelfe, when a little after hee ſaies, *Si in ſphæris planetarum degeremus, plurima forſan cœleſtium nebularum vellere toto æthere paſſim*

dispersa videremus, quorum species jam evanescit nimia spatii intercapedine. "If we did live in the "spheares of the Planets, wee "might there, perhaps, discerne "many great clouds dispersed "through the whole Heavens, which are not now visible by reason of this great distance.

2. *Mæslin* and *Keplar* affirme, that they have seene some of these alterations. The words of *Mæslin* are these (as I finde them cited.) *In eclipsi Lunari vespere Dominicæ Palmarum Anni* 1605. *in corpore Lunæ versus Boream, nigricans quædam macula conspecta fuit, obscurior cætero toto corpore, quod candentis ferri figuram repræsentabat; dixisses nubila in multam regionem extensa pluviis & tempestuosis imbribus gravida, cujusmodi ab excelsorum montium jugis in humiliora convallium loca videre non raro contingit.* "In that "lunary eclipse which happe-"ned in the even of Palme-sun-"day,

Disser. 2. cum nunc. Galil.

"day, in the yeere 1605, there "was a certaine blackish spot "discerned in the Northerly "part of the Moone, being dar-"ker than any other part of her "body, and representing the co-"lour of red hot yron; you might "conjecture that it was some di-"lated cloud, being pregnant "with showers, for thus doe such "lower clouds appeare from the "tops of high mountaines.

Unto this I may adde another testimony of *Bapt. Cisatus*, as he is quoted by *Nicrembergius*, grounded upon an observation taken 23. yeeres after this of *Mæstin*, and writ to this *Euseb. Nicremberg.* in a letter by that diligent and judicious Astronomer. The words of it runne thus: *Et quidem in eclipsi nupra solari quæ fuit ipso die natali Christi, observavi clarè in luna soli supposita, quidpiam quod valde probat id ipsum quod Cometæ quoq; & maculæ solares urgent, nempe cœlum non esse à tenui-*

Hist. Nat. l. 2. c. 11.

à tenuitate & variationibus aeris exemptum, nam circa Lunam adverti esse sphæram seu orbem quendam vaporosum, non secus atq; circum terram, adeoq; sicut ex terra in aliquam usq; sphæram vapores & exhalationes expirant, ita quoq; ex luna. "In that late solary eclipse "which happened on Christ-"mas day, when the Moone was "just under the Sunne, I plainly "discerned that in her which "may clearely confirme what "the Comets and Sunne spots "doe seeme to prove, *viz.* that "the heavens are not solid, "nor freed from those changes "which our aire is liable unto, "for about the Moone I perci-"ved such an orbe of vaporous "aire, as that is which doth en-"compasse our earth, and as va-"pours and exhalations, are rai-"sed from our earth into this "aire, so are they also from "the Moone.

You see what probable grounds

grounds and plaine teſtimonies I have brought for the confirmation of this Propoſition : many other things in this behalfe might be ſpoken, which for brevity ſake I now omit, and paſſe unto the next.

Propoſition 13.

That 'tis probable there may be inhabitants in this other World, but of what kinde they are is uncertaine.

I Have already handled the Seaſons and Meteors belonging to this new World: 'tis requiſite that in the next place I ſhould come unto the third thing which I promiſed, and to ſay ſomewhat of the inhabitants, concerning whom there might be many difficult queſtions raiſed, as whether that place be more inconvenient for habitation

tion then our World (as *Keplar* thinkes) whether they are the seed of *Adam*, whether they are there in a blessed estate, or else what meanes there may be for their salvation, with many other such uncertaine enquiries, which I shall willingly omit, leaving it to their examination, who have more leisure and learning for the search of such particulars.

Being for mine own part content only to set downe such notes belonging unto these which I have observed in other Writers. *Cum tota illa regio nobis ignota sit, remanent inhabitatores illi ignoti penitus*, (saith *Cusanus*) since we know not the regions of that place, wee must be altogether ignorant of the inhabitants. There hath not yet beene any such discovery concerning these, upon which wee may build a certainty, or good probability: well may wee guesse at them, and that

De doct. ign. l. 2. c. 12.

that too very doubtfully, but we can know nothing, for if we doe hardly guesse aright at things which be upon earth, if with labour wee doe finde the things that are at hand, how then can wee search out those things that are in Heaven? What a little is that which wee know? in respect of those many matters contained within this great Universe, this whole globe of earth and water? though it seeme to us to be of a large extent, yet it beares not so great a proportion unto the whole frame of Nature, as a small sand doth unto it; and what can such little creatures as wee discerne, who are tied to this point of earth? or what can they in the Moone know of us? If wee understand any thing (saith *Esdras*) 'tis nothing but that which is upon the earth, and hee that dwelleth above in the Heavens, may onely understand

Wisd.9.16.

2 Esd.4.22.

ſtand the things that are above in the heighth of the heavens.

So that 'twere a very needeleſſe thing for us, to ſearch after any particulars, however, wee may gueſſe in the generall, that there are ſome inhabitans in that Planet: for why elſe did Providence furniſh that place with all ſuch conveniences of habitation as have beene above declared?

But you will ſay, perhaps, is there not too great and intollerable a heate, ſince the Sunne is in their Zinith every moneth, and doth tarry their ſo long before hee leaves it?

I anſwer, 1. This may, perhaps, be remedied (as it is under the line) by the frequencie of mid-day ſhowers, which may cloud their Sunne, and coole their earth: 2. The equality of their nights doth much temper the ſcorching of the day, and the extreme cold that comes from

from the one, require ſome ſpace before it can be diſpelled by the other, ſo that the heate ſpending a great while before it can have the victory, hath not afterwards much time to rage in. Wherfore notwithſtanding this, yet that place may remaine habitable. And this was the opinion of the *Cardinal de cuſa*, when ſpeaking of this Planet, he ſaies, *Hic locus Mundi eſt habitatio hominum & animalium atq; vegetabilium.* "This part of the "world is inhabited by men and "beaſts, and Planets. To him aſſented *Campanella*, but hee cannot determine whether there were men, or rather ſome other kinde of creatures. If they were men, then he thinkes they could not be infected with *Adams* ſinne; yet, perhaps, they had ſome of their owne, which might make them liable to the ſame miſery with us, out of which, perhaps, they were delivered

De doct. ign. l. 2. c. 12.

livered by the same means as we, the death of Christ, and thus he thinkes that place of the *Ephesians* may be interpreted, where the Apostle saies, *God gathered all things together in Christ, both which are in earth, and which are in the heavens* : So also that of the same Apostle to the *Colossians*, where hee saies, that *it pleased the Father to reconcile all things unto himselfe by Christ, whether they be things in earth, or things in heaven.*

Eph.1.10.

Col.1.20.

But I dare not jest with Divine truthes, or apply these places according as fancy directs. As I thinke this opinion doth not any where contradict Scripture, so I thinke likewise, that it cannot be proved from it, wherefore *Campanella's* second conjecture may be more probable, that the inhabitants of that world, are not men as wee are, but some other kinde of creatures which beare some proportion

portion and likenesse to our natures, and *Cusanus* too thinkes they differ from us in many respects; I will set downe his words as they may bee found in the abovecited place, *Suspicamur in regione solis magis esse solares, claros & illuminatos intellectuares habitatores, spiritualiores etiam quam in lunâ, ubi magis lunatici, & in terra, magis materiales, & grossi, ut illi intellectualis naturæ solares sint multum in actu & parum in potentia; terreni verò magis in potentia, & parum in actu, lunares in medio fluctuantes. Hoc quidem opinamur ex influentia ignili solis aquatica simul & aeria lunæ, & gravedine materiali terræ, & consimiliter de aliis stellarum regionibus suspicantes, nullam habitatoribus carêre, quasi tot sint partes particulares mundiales unius universi, quot sunt stellæ quarum non est numerus, nisi apud eum qui omnia in numero creavit.*

"Wee may conjecture (saith "he) the inhabiters of the Sunne "are like to the nature of that "Planet, more cleare and bright, "more intellectuall and spiri-"tuall than those in the Moone "where they are neerer to the "nature of that duller Planet, "and those of the earth being "more grosse and materiall "than either, so that these in-"tellectuall natures in the Sun, "are more forme than matter, "those in the earth more mat-"ter than forme, and those "in the Moone betwixt both. "This wee may guesse from the "fiery influence of the Sunne, "the watery and aereous influ-"ence of the Moone, as also "the matereall heavinesse of the "earth. In some such manner "likewise is it with the regions "of the other Starres, for wee "conjecture that none of them "are without inhabitants, but "that there are so many particu-

"lar

"lar worlds and parts of this "one universe, as there are Stars "which are innumerable, unlesse "it bee to him who created all "things in number.

For he held that the stars were not all in one equall Orbe as we commonly suppose, but that some were farre higher than others which made them appeare lesse, and that many others were so farre above any of these, that they were altogether invisible unto us. An opinion (which as I conceive) hath not any great probability for it, nor certainty against it.

The Priest of *Saturne* relating to *Plutarch* (as he faignes it) the nature of the Selenites, told him they were of divers dispositions, some desiring to live in the lower parts of the Moone, where they might looke downewards upon us, while others were more surely mounted aloft, all of them shining like the rayes of

the Sun, and as being victorious are crowned with garlands made with the wings of *Eustathia* or *Constancie.*

It hath beene the opinion amongst some of the Ancients, that their Heavens and Elysian fields were in the Moone where the aire is most quiet and pure. Thus *Socrates*, thus *Plato*, with his followers, did esteeme this to bee the place where those purer soules inhabit, who are freed from the Sepulchre, and contagion of the body. And by the Fable of *Ceres*, continually wandring in search of her daughter *Proserpina*, is meant nothing else but the longing desire of men, who live upon *Ceres* earth, to attaine a place in *Proserpina*, the Moone or Heaven.

Nat. Com. lib.3. c.19.

Plutarch also seemes to assent unto this, but hee thinkes moreover, that there are two places of happinesse answerable to those two parts which hee fancies to re-

remaine of a man when hee is dead, the ſoule and the under-ſtanding; the ſoule he thinkes is made of the Moone, and as our bodies doe ſo proceede from the duſt of this earth, that they ſhall returne to it hereafter, ſo our ſoules were generated out of that Planet, and ſhall bee reſolved into it againe, whereas the under-ſtanding ſhall aſcend unto the Sunne, out of which it was made where it ſhall poſſeſſe an eternity of well being, and farre greater happineſſe than that which is enjoyed in the Moone. So that when a man dies, if his ſoule bee much polluted, then muſt it wander up and downe in the middle regions of the aire where hell is, and there ſuffer unſpeakable torments for thoſe ſinnes whereof it is guilty. Whereas the ſoules of better men, when they have in ſome ſpace of time beene purged from that impurity which they did derive from the body,

then doe they returne into the Moone, where they are possest with such a joy, as those men feele who professe holy misteries, from which place (saith he) some are sent downe to have the superintendance of Oracles, being diligent either in the preservation of the good, either from or in all perils, and the prevention or punishment of all wicked actions, but if in these imployments they mis-behave themselves, then are they againe to be imprisoned in a body, otherwise they remaine in the Moone till their body be resolved into it, & the understanding being cleared from all impediments, ascends to the Sunne which is its proper place. But this requires a diverse space of time according to the divers affections of the soule. As for those who have beene retired and honest, addicting themselves to a studious and quiet life, these are quickly preferred to a higher

higher happineſſe. But as for ſuch who have buſied themſelves in many broyles, or have beene vehement in the proſecution of any luſt, as the ambitious, the amorous, the wrathfull man, theſe ſtill retaine the glimpſes and dreames of ſuch things as they have performed in their bodies, which makes them either altogether unfit to remaine there where they are, or elſe keepes them long ere they can put off their ſoules. Thus you ſee *Plutarchs* opinion concerning the inhabitants and neighbours of the Moone, which (according to the manner of the Academickes) hee delivers in a third perſon; you ſee he makes that Planet an inferiour kind of heaven, and though hee differ in many circumſtances, yet doth hee deſcribe it to be ſome ſuch place, as wee ſuppoſe Paradiſe to be. You ſee likewiſe his opinion concerning the place of damned ſpi-

rits, that it is in the middle region of the aire, and in neither of these is hee singular, but some more late and Orthodox Writers have agreed with him. As for the place of hell, many thinke it may be in the aire as well as any where else.

De civit. Dei. lib. 22. ca. 16.

True indeed, Saint *Austin* affirmes that this place cannot bee discovered; But others there are who can shew the situation of it out of Scripture; Some holding it to bee in some other world without this, because our Saviour calls it σκότος ἐξώτερον, outward darkenesse. But the most will have it placed towards the Center of our earth, because 'tis said, Christ descended into the lower parts of the earth, and some of these are so confident, that this is its situation, that they can describe you its bignes also, and of what capacity it is. *Francis Ribera* in his Comment on the *Revelations*, speaking of those words,

Mat. 25. 30

Eph. 4. 9.

words, where 'tis ſaid, that the blood went out of the Wine-preſſe, even unto the horſes bridles by the ſpace of one thouſand and ſixe hundred furlongs, interprets them to bee meant of Hell, and that that number expreſſes the diameter of its concavity, which is 200 *Italian* miles; but *Leſſius* thinkes that this opion gives them too much roome in hell, and therefore hee gueſſes that 'tis not ſo wide; for (ſaith hee) the diameter of one league being cubically multiplied, will make a ſpheare capable of 800000 millions of damned bodies, allowing to each ſixe foote in the ſquare, whereas (ſaies hee) 'tis certaine that there ſhall not be one hundred thouſand millions in all that ſhall bee damned. You ſee the bold *Ieſuit* was carefull that every one ſhould have but roome enough in hell, and by the ſtrangeneſſe of the conjecture, you may gueſſe that he had rather

Rev. 14. 20.

De Morib. div. l. 13. c. 24.

rather bee absurd, than seeme either uncharitable or ignorant. I remember there is a relation in *Pliny*, how that *Dionisiodorus* a Mathematician, being dead, did send a letter from his place to some of his friends upon earth, to certifie them what distance there was betwixt the center and superficies: hee might have done well to have prevented this controversie, and enformed them the utmost capacity of that place. However, certaine it is, that that number cannot bee knowne, and probable it is, that the place is not yet determined, but that hell is there where there is any tormented soule, which may bee in the regions of the aire as well as in the center; but of this onely occasionally, and by reason of *Plutarchs* opinion concerning those that are round about the Moone; as for the Moone it selfe, hee esteemes it to bee a lower kinde of Heaven, and therefore

therefore in another place hee cals it a terreſtraill ſtarre, and an Olympian or celeſtiall earth anſwerable, as I conceive, to the paradiſe of the Schoolemen, and that Paradiſe was either in or neere the Moone, is the opinion of ſome later Writers, who derived it (in all likelihood) from the aſſertion of *Plato*, and perhaps, this of *Plutarch*. *Toſtatus* laies this opinion upon *Iſidor. Hiſpalenſis*, and the venerable *Bede*; and *Pererius* fathers is upon *Strabus* and *Rabanus* his Maſter. Some would have it to bee ſituated in ſuch a place as could not be diſcovered, which cauſes the penman of *Eſdras* to make it a harder matter to know the outgoings of Paradiſe, then to weigh the weight of the fire, or meaſure the blaſts of wind, or call againe a day that is paſt. But notwithſtanding this, there bee ſome others who thinke that it is on the top of ſome high mountaine under

Curſilent oracula.

S. W. Raw. lib. 1. cap. 3. § 7. in Gen.

2 Eſd. 4. 7.

der the line, and these interpreted the torrid Zone to be the flaming Sword whereby Paradise was guarded. 'Tis the consent of divers others, who agree in this, that Paradise is situated in some high and eminent place. So *Testatus: Est etiam Paradisus situ altissima, supra omnem terræ altitudinem*, "Paradise is situated in "some high place above the "earth: and therefore in his Cõment upon the 49. of *Genesis*, hee understands the blessing of *Iacob* concerning the everlasting hills to bee meant of Paradise, and the blessing it selfe to bee nothing else but a promise of Christs comming, by whose passion the gates of Paradise should bee opened. Unto him assented *Rupertus*, *Scotus*, and most of the other Schoolemen, as I find them cited by *Pererius*, and out of him in Sr. *W. Rawleigh*. Their reason was this: because in probability this place was not overflowed by

In Genes.

Comment. in 2. Gen. v 8. lib 1. cap 3. § 67.

by the flood, ſince there were no ſinners there which might draw that curſe upon it. Nay *Toſtatus* thinkes that the body of *Enoch* was kept there, and ſome of the Fathers, as *Tertullian* and *Auſtin* have affirmed, that the bleſſed ſoules were reſerved in that place till the day of judgement, and therefore 'tis likely that it was not overflowed by the flood; and beſides, ſince all men ſhould have went naked if *Adam* had not fell, 'tis requiſite therefore that it ſhould be ſituated in ſome ſuch place where it might bee priviledged from the extremities of heat and cold. But now this could not bee (they thought) ſo conveniently in any lower, as it might in ſome higher aire. For theſe and ſuch like conſiderations have ſo many affirmed that Paradiſe was in a high elevated place, which ſome have conceived could bee no where but in the Moone: For

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it could not be in the top of any mountaine, nor can we thinke of any other body separated from this earth which can bee a more convenient place for habitation than this Planet, therefore they concluded that it was there.

It could not bee on the top of any mountaine.

1. Because wee have expresse Scripture, that the highest of them was overflowed. Gen. 7. 19.

2. Because it must bee of a greater extension, and not some small patch of ground, since 'tis likely all men should have lived there, if *Adam* had not fell. But for a satisfaction of these arguments, together with a farther discourse of Paradise, I shall referre you to those who have written purposely upon this subject. Being content for my owne part to have spoken so much of it, as may conduce to shew the opinion of others concerning the inhabitants of the

Moone

Moone, I dare not my ſelfe affirme any thing of theſe Selenites, becauſe I know not any ground whereon to build any probable opinion. But I thinke that future ages will diſcover more; and our poſterity, perhaps, may invent ſome meanes for our better acquaintance with theſe inhabitants. 'Tis the method of providence not preſently to ſhew us all, but to lead us a long from the knowledge of one thing to another. 'Twas a great while ere the Planets were diſtinguiſhed from the fixed Stars, and ſometime after that ere the morning and evening ſtarre were found to bee the ſame, and in greater ſpace I doubt not but this alſo, and farre greater myſteries will bee diſcovered. In the firſt ages of the world the Iſlanders either thought themſelves to be the onely dwellers upon the earth, or elſe if there were any other, yet they could not poſ-

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sibly conceive how they might have any commerce with them, being severed by the deepe and broad Sea, but the after-times found out the invention of ships, in which notwithstanding none but some bold daring men durst venture, there being few so resolute as to commit themselves unto the vaste Ocean, and yet now how easie a thing is this, even to a timorous & cowardly nature? So, perhaps, there may be some other meanes invented for a conveyance to the Moone, and though it may seeme a terrible and impossible thing ever to passe through the vaste spaces of the aire, yet no question there would bee some men who durst venture this as well as the other. True indeed, I cannot conceive any possible meanes for the like discovery of this conjecture, since there can bee no sailing to the Moone, unlesse that were true which the Poets doe but feigne, that

that shee made her bed in the Sea. We have not now any *Drake* or *Columbus* to undertake this voyage, or any *Dædalus* to invent a conveyance through the aire. However, I doubt not but that time who is still the father of new truths, and hath revealed unto us many things which our Ancestours were ignorant of, will also manifest to our posterity, that which wee now desire, but cannot know. *Veniet tempus* (saith *Seneca*) *quo ista quæ nunc latent, in lucem dies extrahet, & longioris ævi diligentia.* Time will come when the indeavours of after-ages shall bring such things to light, as now lie hid in obscurity. Arts are not yet come to their Solstice, but the industry of future times assisted with the labours of their forefathers, may reach unto that height which wee could not attaine to. *Veniet tempus quo posteri nostri nos tam aperta nesoisse miren-*

Nat. Quæst. l. 7. c. 25.

mirentur. As wee now wonder at the blindnesse of our Ancestors, who were not able to discerne such things as seeme plaine and obvious unto us. So will our posterity admire our ignorance in as perspicuous matters. *Keplar* doubts not, but that as soone as the art of flying is found out, some of their Nation will make one of the first colonies that shall inhabite that other world. But I leave this and the like conjectures to the fancie of the reader; Desiring now to finish this Discourse, wherein I have in some measure proved what at the first I promised, a world in the Moone. However, I am not so resolute in this, that I thinke tis necessary there must be one, but my opinion is that 'tis possible there may be, and tis probable there is another habitable world in that Planet. And this was that I under-

undertooke to prove. In the purſuit whereof, if I have ſhewed much weakneſſe or indiſcretion; I ſhall willingly ſubmit my ſelfe to the reaſon and cenſure of the more judicious.

The Propositions that are proved in this Discourse.

Proposition 1.

That the strangenesse of this opinion is no sufficient reason why it should be rejected, because other certaine truths have beene formerly esteemed ridiculous, and great absurdities entertayned by common consent.

By way of Preface.

Prop. 2.

That a plurality of worlds doth not contradict any principle of reason or faith.

Prop. 3.

Prop. 3.

That the heavens doe not consist of any such pure matter which can priviledge them from the like change and corruption, as these inferiour bodies are liable unto.

Prop. 4.

That the Moone is a solid, compacted, opacous body.

Prop. 5.

That the Moone hath not any light of her owne.

Prop. 6.

That there is a world in the Moone, hath beene the direct opinion of many ancient, with some moderne Mathematicians, and may probably be deduced from the tenents of others.

Prop. 7.

Prop. 7.

That those spots and brighter parts which by our sight may be distinguished in the Moone, doe shew the difference betwixt the Sea and Land in that other World.

Prop. 8.

That the spots represent the Sea, and the brighter parts the Land.

Prop. 9.

That there are high Mountaines, deepe vallies, and spacious plaines in the body of the Moone.

Prop. 10.

That there is an Atmo-sphæra, or an orbe of grosse vaporous aire, immediately encompassing the body of the Moone.

Prop. 11.

Prop. 11.

That as their world is our Moone, so our world is their Moone.

Prop. 12.

That tis probable there may bee such Meteors belonging to that world in the Moone, as there are with us.

Prop. 13.

That tis probable there may be inhabitants in this other World, but of what kinde they are is uncertaine.

FINIS.

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