

Jacques Rohault

Preface to *Traité de Physique*

PREFACE.

COMME les Traités de Physique qui ont paru jusqu'à présent, ont été presque tous semblables, soit pour la matiere, soit pour la methode, je prévoi qu'entre ceux qui liront celui-ci, il s'en trouvera beaucoup qui d'abord pourront être étonnés de la  
5 grande difference qu'ils remarqueront entre ce Traité-ci & les autres; C'est pourquoi pour prévenir aucunement leur surprise, & tâcher de les satisfaire là-dessus, je me trouve en quelque façon obligé de leur rendre raison des observations que j'ai faites sur la Physique des Anciens, & de la conduite que j'ai gardée dans tout cet Ouvrage.

Il y a déjà quelques années que faisant reflexion sur les differens effets du temps,  
10 comme il est favorable à certaines choses, dont il avance toujours la perfection, & comme il est nuisible à d'autres, qu'il dépouille des beautés & des graces qu'elles avoient dans leur commencement, je concludois que les Arts & les Sciences ne pouvoient être de ces dernieres, & que le temps au-contre bien loin de leur être préjudiciable, ne leur pouvoit être que très-avantageux: Car pendant qu'un très-grand  
15 nombre de personnes, qui dans la suite des siecles cultivent une même science, ou un | même art, ajoûtent leur propre industrie, & leur nouvelles lumieres aux anciennes découvertes de ceux qui les ont précédés, il paroît comme impossible que cet art, ou cette science, ne reçoivent de grands accroissemens, & n'approche de plus en plus de sa derniere perfection.

En effet, je voyois que les Mathematiques s'étoient de cette façon peu-à-peu augmentées, comme il est aisé à chacun de s'en convaincre, si l'on considere seulement les notables progrès qui s'y sont faits de nostre temps, par ces grands genies qui y ont excellé, & qui ont surmonté des difficultés, où les plus Savans des siecles passés avoient avoué qu'ils s'étoient trouvés courts. Je voyois aussi que la plûpart des Arts  
20 s'étoient perfectionnés par le temps, les Ouvriers ayant de jour en jour trouvé une infinité de belles inventions, qu'on n'estime pas autant qu'elles le meritent, parce qu'elles sont devenues fort communes, & qu'on n'y fait pas d'attention; Quoiqu'entre les seules machines qui servent à la fabrique des choses qui sont à notre usage, il y en ait telle qui n'a été inventée que depuis peu, qui contient tant d'artifice, qu'elle  
25 seule merite plus nostre admiration, que toutes celles que l'Antiquité a trouvées.

Mais venant à considerer la Philosophie, & particulièrement la Physique, je demeurai étrangement surpris de la voir si sterile, qu'elle n'eût produit aucun fruit pendant plus de vingt siecles, qui se sont écoulés sans qu'on y ait fait la moindre

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THE *Author's PREFACE.*

THE Treatises of Natural Philosophy which have hitherto been published, being pretty much alike, both as to the Matter of them, and the Manner of handling them; It is easy for me to foresee, that amongst those who read This, there will be a great many who will be at first surprized at the great Difference there is between this Treatise and others. To prevent therefore in some Measure this Surprize, and to give what Satisfaction I can in this Matter, I think my self obliged to give an Account of the Observations which I have made upon the Philosophy of the Ancients, and of the Method which I have taken in this Work. 5R

IN reflecting upon the different Effects of Time, I have long since observed, how favourable it is to some Things, which it is continually advancing to Perfection, and how pernicious it is to others, so as to strip them of those Beauties and Graces | which they had at their first Rise; and I always concluded that Arts and Sciences cannot be of the Number of these latter, but that Time is so far from being prejudicial to them, that on the other Hand it is very advantageous. For as a great Number of Persons who cultivate the same Art or Science for several succeeding Ages, add their own Industry, and their new Light to the ancient Discoveries of those who went before them, it is impossible but that such an Art or Science must receive great Improvement, and arrive nearer and nearer to its utmost Perfection. 10R 15R

AND thus I saw that Mathematicks did really increase by little and little in this Manner; as it is easy for any one to be convinced of, who considers only the vast Progress that hath been made by the great Genius's of our Time, who have excelled all others in this Particular, and surmounted such Difficulties as the most Learned in former Ages confessed they were not able to solve. I saw also that most Arts were perfected by Time; Workmen every Day finding out a Multitude of curious Inventions, which are not so much esteemed as they deserve, because they are very common, and we do not enough take Notice of them. Though amongst those Engines which are employed in making Things of common Use, there is *One* that has been lately invented, which has in it so much Contrivance, that this single Thing deserves to be | more admired than all the Inventions of Antiquity. 20R 25R 30R

BUT when I came to consider Philosophy, particularly Natural Philosophy, I was very much surprized to see it so barren as not to have produced any Fruit; in so much that twenty Ages have passed, without any new Discovery made in it.

découverte.

35       Cependant il ne me pouvoit pas tomber en | l'esprit qu'on eût négligé l'étude  
des choses naturelles, comme si elles n'eussent été d'aucun usage, sachant qu'on a  
de tout temps considéré la santé, comme l'un des plus grands biens de la vie, & que  
l'on n'a jamais ignoré que la Medecine qui n'a point d'autre fin que de l'entretenir,  
& de la réparer lors qu'elles est alterée, ne dût être fondée sur la Physique.

40       Je ne pouvois pas non plus m'imaginer, que ceux qui ont cultivé cette science,  
eussent été moins spirituels que de simples artisans, l'experience faisant assez con-  
noître, que dans les familles, où il y a plusieurs enfants, lors qu'il s'agit du choix  
des professions, ce sont d'ordinaire ceux en qui il paroît plus de vivacité d'esprit,  
que l'on destine à l'étude, ou qui s'y portent d'eux-mêmes; Et qu'il n'y a gueres que  
45       ceux dont l'intelligence est plus bornée, que l'on applique aux divers Arts, & qui se  
contentent de ce partage.

      Sur cela, il me vint en pensée, que peut-être la connoissance des choses naturelles  
surpassoit la capacité de l'esprit humain, & qu'ainsi vainement se travailloit-il, pour  
atteindre à ce qui étoit au-dessus de sa portée; Mais je rejetai bien-tôt cette imagi-  
50       nation, considerant les surprenantes productions de quelques Philosophes de nostre  
sicle, qui depuis quarante ou cinquante années ont trouvé des choses qu'on jugeoit  
des plus difficiles, & que quelques-uns même doutoient qu'on pût jamais découvrir.

      Ainsi, je me vis forcé de conclure, qu'il faloit que ce fût dans la maniere de philoso-  
pher qu'on se fût mépris jusques ici, & que | les defauts qui s'y étoient introduits, tant  
55       que personne n'avoit pensé à y remedier, avoient été comme une espece de barriere  
qui avoit empêché qu'on n'approchât de la verité.

      Je m'appliquai donc à tâcher d'approfondir en quoi la conduite des Philosophes  
auroit pû être defectueuse; Et après avoir examiné le plus soigneusement qu'il me  
fut possible, celle que l'on a tenue depuis les Ecoles d'Athenes jusques à nos temps,  
60       il me sembla que l'on y pouvoit trouver quatre choses à redire.

      La premiere, est ce grand credit qu'on a toujours donné aux Anciens dans les  
Ecoles: Car outre que cette prodigieuse difference qu'on met entr'eux & les Modernes,  
n'a aucun fondement, vû que la raison est de tout pays & de tout âge, il est certain  
qu'une soumission si aveugle à tous les sentimens de l'Antiquité, est cause que les  
65       meilleurs Esprits, recevant souvent sans y penser des opinions comme vraies qui  
peuvent être fausses, ne sont plus en état de connoître celles qui leur sont opposées,  
ni par consequent de trouver toutes les autres verités dépendantes de celles qu'un

HOWEVER, I could not persuade my self, that the Study of Natural Things was neglected, because it was thought to be of no Use; for Health has always been esteemed one of the chief Blessings of Life, and no one can be ignorant, that Physick, the sole End of which is to maintain and restore Health, is built upon Natural Philosophy. 35R

NOR could I ever persuade my self, that those who improved this Science were less ingenious, than common Artists: For we find by Experience that in Families where there are a great many Children, when they come to make choice of their Professions, those of them which have the quickest Genius, are appointed for Study, or voluntarily incline themselves to it; and those only whose Understanding is not so good, apply themselves to the mechanical Arts, and are contented with their Lot. 40R

HEREUPON I suspected, that perhaps the Knowledge of Natural Things was above the Reach of humane Understanding, so that it was in vain to labour to attain that which is beyond our Capacity: but when I | consider'd the surprizing Things done by some Philosophers of our own Age, who within forty or fifty Years have found out Things which were looked upon as most difficult, and which some have doubted, whether ever they could be found out at all; I immediately cast off this Suspicion. 45R

SO that I was forced to conclude, that the *Manner* of philosophizing, was the Thing that had hitherto been mistaken, and that the Errors *therein* which have been introduced, being such as no Body had any Hopes of finding out a Remedy equal to, were a certain Bar to hinder the Approaches towards Truth. I set my self then to enquire wherein the *Manner* of their treating Philosophy was defective; and after having examined with the greatest Diligence possible, what the Method has been from the Schools of the *Athenians* down to this very Time; there seemed to me to be four Things blameable in this Matter. 50R

*First*, THE too great Authority that hath always been given to the Ancients in the Schools: For besides that this prodigious Difference which is put between them and the Moderns, is without the least Foundation; (for Reason is to be found in every Place and every Age;) it is certain that such a blind Submission to the Opinions of Antiquity, is the Cause why Persons of the greatest Genius, (receiving such Opinions for true without considering them, when perhaps they may be false,) have not an Opportunity of knowing the contrary Opinions, nor consequently of finding out all those other Truths that depend upon those which so fatal a Prejudice has hindred them from seeing. And further, this strong Persuasion of our being so 55R

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si pernicieux préjugé les empêche d'appercevoir. Et de plus, cette forte persuasion  
d'être si fort inferieur aux Anciens, engendre une espece de paresse, ou de défiance,  
70 qui ne permet pas de rien entreprendre; On croit que la raison est bornée par-tout  
où ils sont demeurés, & qu'on fait tout ce qu'il est possible de faire humainement,  
quand on va jusqu'où ils ont été. Ainsi, les meilleurs Esprits contens de repasser  
les raisonnemens des Anciens, n'exercent point | leur propre raison; & tout capables  
qu'ils sont par eux-mêmes d'inventer, ils ne contribuent non plus à l'avancement de  
75 la Physique, que s'ils ne se mêloient point-du-tout de philosopher.

Je ne parlerai point en particulier de la veneration que l'on a eue pour Aristote,  
quoi qu'elle aille quelquefois à tel excès, qu'il suffit d'alleguer qu'il a dit une chose,  
pour faire non seulement douter de ce que la raison persuade au-contraire, mais  
même pour le faire condamner. Je ferai seulement remarquer, que l'imagination  
80 que plusieurs ont eue qu'il savoit tout ce qui se peut savoir, & que toute la science  
étoit contenue dans ses livres, a fait que la plûpart des plus Grands Hommes qui  
ont philosophé depuis lui, se sont inutilement appliqués à lire ses Ouvrages, pour y  
trouver ce qui n'y étoit pas, & ce qu'ils auroient peut-être rencontré, s'ils n'avoient  
suivi que leurs propres lumieres. Que si quelques-uns, un peu moins passionnés  
85 que les autres, ont moins esperé de cette lecture, toujourns est-il arrivé que le desir  
de se rendre recommandables, en expliquant les endroits qu'il a laissés obscurs, ou  
de propos délibéré, comme quelques-uns le pretendent, ou faute de plus grandes  
lumieres, leur a fait employer très-inutilement toutes les forces de leur esprit, & tout  
le loisir qu'ils ont eu, à commenter ce qu'il a écrit de la Physique, sans rien avancer  
90 dans cette science: Car ceux qui se sont mêlés d'interpreter Aristote l'ont entendu si  
diversement, qu'ils ont partagé toutes les Ecoles sur le sens d'une infinité de Textes;  
Et s'ils ont pu s'accorder sur quelques-uns, c'est que les notions en sont si communes,  
qu'elles ne sauroient être | ignorées que de très-peu de personnes. Ainsi, l'on s'est  
plus occupé à étudier Aristote que la nature, qui peut-être n'est pas à beaucoup près  
95 si mysterieuse que luy; Il y a même mille choses qu'elle dit nettement, à qui les veut  
entendre; Mais quoi! ce n'est pas la coutume, on aime mieux écouter Aristote, & les  
Anciens, & c'est ce qui fait que l'on avance si peu.

La seconde chose qui empêche le progrès de la Physique, est qu'on la traite trop  
metaphysiquement, & qu'on ne s'arrête souvent qu'à des questions si abstraites &  
100 si generales, que quand bien même tous les Philosophes seroient de même avis sur  
chacune, cela ne pourroit servir à expliquer en particulier le moindre effet de la

much inferiour to the Ancients, causes in us a Kind of Sluggishness and Diffidence, which hinders us from attempting to enquire into any Thing at all. We imagine that Reason is limited at the Place where they stopped, and that all is done that can be done humanely speaking, if we go as far as they went. Thus the greatest Genius's contenting themselves with going over the Reasonings of the Ancients, don't exercise their own Reason at all; and though they be never so capable of finding out any Thing themselves, they contribute no more to the advancing Natural Philosophy, than if they had not meddled with it at all. 70R  
75R

I SAY nothing particular of that Veneration which hath been paid to *Aristotle*, though sometimes it has risen to such an Excess; that to alledge that he said such a Thing, was sufficient to make any One not only to doubt of what his Reason convinced him, but even to condemn it. I shall only make this Observation; that the Imagination which a great many have had, that he knew all that could be known; and that all Science was contained in his Books, hath caused the greatest Part of the best Philosophers since to apply themselves in vain to | read his Works, to find out in them what was not there, and what they might perhaps otherwise have found out by their own Ingenuity. But if there have been some who, not being quite so zealous as others, did not hope to reap so very much Fruit from reading him; yet it always happened that the Desire of recommending themselves by explaining those Places which he left obscure (on purpose, as some think, or else for want of better Light) hath made them employ their whole Strength of Mind, and all their leisure Time, to very little Purpose, in writing Comments upon his Philosophy, without promoting the Science at all: For those who have undertook to explain *Aristotle*; have understood him so differently, that there are an infinite Number of Places which all the Schools are divided about; And if there be some few in which they have agreed, it is because the Notions contained in them were so common, that very few Persons were ignorant of them. So that they took more Pains to study *Aristotle* than they did to study Nature, which perhaps is not near so mysterious as He. There are a Multitude of Things which Nature plainly declares to those who apply their Mind thereto. But alas, this is not the Custom, we had rather hearken to *Aristotle* and the Ancients; and this is the Reason why we make so little Progress. 80R  
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ANOTHER Thing which hinders the Progress of Natural Philosophy, is the Treating thereof in a Manner too metaphysical; and the Disputing about Questions so abstract and general, that though all Philosophers were agreed in their Notions of them, 100R

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nature; Cependant une science d'usage doit bien-tôt descendre dans le particulier. A quoi bon, par exemple, ces longues & subtiles disputes touchant la divisibilité de la matiere? Car quand bien même on ne pourroit pas décider nettement, si elle se  
105 peut, ou non, diviser à l'infini, ne suffit-il pas de connoître qu'elle se peut diviser en des parties assez petites, pour servir à tous les besoins qu'on en peut avoir?

Il est bon sans doute de rechercher la nature du mouvement en general; Il pourroit même n'être pas tout-à-fait inutile d'examiner un peu s'il a été bien ou mal défini, *l'Acte d'un Etre en puissance, entant qu'il est en puissance*; Mais sans perdre trop  
110 de temps à décider cette question, & autres semblables, je voudrois qu'après s'être un peu arrêté sur la notion generale du mouvement, l'on en examinât en détail & dans le particulier toutes les propriétés, en sorte que ce que l'on en diroit se pût rapporter à l'usage: | En un mot, je voudrois qu'on recherchât soigneusement ce qui peut déterminer la matiere à un tel effet plutôt qu'à un autre, sans s'accoutumer à  
115 dire en general que cet effet est produit par une qualité: Car de cette coutume vient celle de se payer de mots, comme si c'étoit des raisons, & la sottise vanité de croire savoir plus que le commun, quand on sait des mots que le commun ne sait pas, & qui ne signifient rien de particulier. Sans mentir, c'est avoir l'esprit bien petit, & bien-aisé à contenter, que de se persuader que l'on connoît mieux la nature que le reste  
120 des hommes, quand on a appris qu'il y a des qualités occultes, & qu'on en fait une réponse presque generale à toutes les questions que l'on peut faire sur les differens effets que la nature produit. Et en effet, quelle difference peut-il y avoir entre la réponse que peut faire un paysan & celle d'un Philosophe, si leur ayant demandé à tous deux, d'où vient, par exemple, que l'aimant attire le fer, l'un dit qu'il n'en sait  
125 pas la cause, & l'autre dit que cela se fait par une vertu & qualité occulte? N'est ce pas en bon françois dire la même chose en differens termes? Et n'est-il pas visible que toute la difference qu'il y a entre l'un & l'autre, c'est que l'un a assez de bonne foi pour avouer son ignorance, & l'autre assez de vanité pour la vouloir cacher?

Un troisième défaut que j'ai trouvé dans la conduite des Philosophes, est que  
130 quelques-uns veulent toujours raisonner, & se fient tellement aux raisonnemens, surtout quand ils les ont empruntés des Anciens, qu'ils ne veulent faire aucune experience. D'autres au-contre, ennuyés de ces grands raisonnemens, dont la plûpart | sont fautifs, ou qui ne conduisent à rien, ont crû qu'il falloit tout reduire en experience, & ne raisonner de quoi que ce soit: Or ces deux extremités ont été également  
135 contraires au progrès de la Physique. En effet, ceux qui tombent dans la premiere

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yet they would not help to explain the least particular Effect in Nature; whereas every useful Science ought to descend immediately to Particulars. For Instance, what good do those long and nice Disputes do, *about the Divisibility of Matter?* For though it could not be accurately determined, whether it be infinitely divisible or no; it would be sufficient to know, that it can be divided into Parts small enough to serve for all Purposes that can be. 105R

IT is very useful, without doubt, to find out the Nature of Motion in general. And it may not be very improper to examine a little whether it be well or ill defined thus, *The Act of a Being in Power, so far forth as it is in Power.* But we should not spend too much Time in determining this, and such like Questions; I should rather think, that after having considered a little the true Nature of Motion in general, we should particularly and distinctly examine all the Properties of it, so that what we affirm concerning it, may be applied to some Use; In a word, I think we should carefully enquire into the Cause why Matter produces such a particular Effect rather than any other, and not accustom ourselves to say that it is the Effect of a certain *Quality*; for from hence it is that we are led to give | Words instead of Reasons, and hence arises that senseless Vanity of thinking that we know more than others, because we know Words which the common People don't know, and which indeed have no determinate Meaning. To say the Truth; it shows a mean Spirit, and one that is soon satisfied; to believe that we know more of Nature than other Men, because we have learn'd that there are occult Qualities, and can give a General Answer to all Questions proposed to us concerning the different Effects of Nature. For what Difference is there in the Answer of a Plowman and a Philosopher, if they are both asked, whence is it, for Instance, that the Loadstone attracts the Iron, and the one answers, that he does not know the Reason of it, and the other says, it is done by some Vertue or occult Quality? Is not this in plain *English*, to say the same Thing in different Words? and is it not evident, that all the Difference there is betwixt them is only this, that the one is so honest as to confess his Ignorance, and the other has the Vanity to endeavour to conceal his? 110R  
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A THIRD Defect which I have found in the Method of Philosophers, is, that some of them are wholly for Reasoning, and depend so much upon the Strength of their Arguments (especially if they be borrowed from the Antients) that they judge it superfluous to make any Experiments. Others on the contrary, quite tired with such tedious | Arguments, the greatest Part of which are not conclusive, or are nothing 135R

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de ces erreurs, retranchent le plus beau moyen de faire de nouvelles découvertes, & d'assûrer même leurs raisonnemens; Et ceux qui tombent dans la seconde, ôtant la liberté de tirer des conclusions, empêchent de reconnoître une grande suite de verités, qui souvent se peuvent déduire d'une seule experience: Ainsi, il ne peut  
140 être qu'avantageux de mêler les experiences au raisonnement. Car enfin raisonner  
toujours, & ne raisonner que sur des choses aussi generales que celles sur lesquelles  
on raisonne ordinairement, sans descendre à rien de particulier, ce n'est pas le moyen  
d'acquérir des connoissances fort étendues & fort certaines; Aussi voyons-nous qu'on  
a toujours rebattu les mêmes choses, sans en découvrir de nouvelles; & que l'on n'est  
145 pas encore assûré de celles dont on traite, pour generales qu'elles soient. On voit  
même que ceux qui se fient le plus aux raisonnemens qu'ils croyent être d'Aristote,  
sont en continuelle dispute, & qu'ils soutiennent des choses qui sont formellement  
opposées, sans que les raisons dont les uns se servent, puissent attirer les autres à  
leur parti; Ce qui marque combien ces raisonnemens seuls ont peu de certitude &  
150 d'évidence.

Les experiences sont donc necessaires pour l'établissement de la Physique; & c'est une chose qu'Aristote même tenoit si certaine, que la raison pour laquelle il estimoit qu'on ne de- | voit pas appliquer les enfans si jeunes à l'étude de la Physique, étoit parceque cet âge ayant peu d'usage des choses, ils ne pouvoient pas encore  
155 avoir fait beaucoup d'experiences; Et il jugeoit au-contraire qu'assez facilement ils  
pourroient avoir ouverture aux Mathematiques, parceque cette science consiste dans  
de purs raisonnemens, dont l'esprit humain est naturellement capable, & qu'elle est  
indépendante des experiences.

Mais d'un autre côté, de vouloir absolument rejeter le raisonnement pour ne faire  
160 que des experiences, c'est se jeter dans une extremité beaucoup plus préjudiciable  
que la premiere: Car enfin c'est s'écarter entierement de la raison pour donner tout  
au sens, & renfermer nos connoissances dans des bornes bien étroites; puisque les  
experiences ne peuvent servir qu'à nous faire connoître les choses grossieres & sen-  
sibles; De sorte que pour proceder juste dans la recherche des choses naturelles, il  
165 faut necessairement allier ces deux moyens de connoissance, & joindre ensemble le  
raisonnement avec l'experience.

Mais pour faire mieux connoître l'heureux effet de cette alliance, & l'usage qui s'en peut tirer à l'avantage de la Physique, il faut remarquer qu'il y a de trois sortes d'experiences; La premiere, à proprement parler, n'est qu'un simple usage des sens,

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to the Purpose, think every Thing ought to be reduced to Experiment, and that there should be no Reasoning at all. But both these Extremes do equally hinder the Progress of Natural Philosophy. For they who fall into the first of these Errors, hinder themselves of the best Means of finding out new Discoveries, and of confirming their own Arguments likewise; And they who fall into the second, by depriving themselves of the Liberty of drawing Conclusions, hinder the Knowledge of a large Train of Truths, which may many Times be deduced from one single Experiment. Wherefore it cannot but be very advantageous to mix Experiments and Arguments together. For Reasoning perpetually, and upon such general Things only as are ordinarily argued about, without descending to Particulars, is by no Means the Way to attain any very extensive or very certain Knowledge: Thus we see the same Things continually bandyed about, and no new Discoveries made; nay, we are not very sure of the old ones, as general as they are. We see also that they who confide most in those Arguments which they believe to be *Aristotle's*, are in perpetual Dispute, and that they contend for Opinions which are directly contrary to one another, without being able to convince those of the other Side by their Arguments. And this plainly shows how little Certain- | ty or Evidence there is in their bare Reasoning. 140R 145R 150R

EXPERIMENTS therefore are necessary to establish Natural Philosophy; and this was a Thing which *Aristotle* was so fully convinced of, that the Reason why he thought that very young Persons should not apply themselves to the Study of Natural Philosophy, was, because at that Age they are so little acquainted with Things, as to be unable to have made many Experiments; and on the other Hand he was of Opinion, that they were then most capable of receiving Mathematicks, because this Science consists of meer Reasoning, of which the Mind of Man is naturally capable, and does not at all depend upon Experiments. 155R 160R

BUT on the contrary to reject entirely all Reasoning, in order to do nothing but make Experiments, is to run into another Extremity much more prejudicial than the former. For this is wholly to discard Reason, and yield all up to Sense, and to contract our Knowledge into a very narrow Compass; for by Experiments we can come to the Knowledge of gross and sensible Things only. Wherefore if we would proceed rightly in our Enquiries into natural Things, we must of Necessity mix these two Means of Knowledge together, and join Reason with Experiments. 165R

AND that we may the better see the good Effects of these two when joined together, and the Use that may be made of them, | to the Advantage of Natural

170 comme lorsque par hazard & sans dessein, jettant les yeux sur les choses qui sont  
alentour de nous, nous ne faisons que les regarder, sans penser à appliquer ce que  
nous voyons à aucun usage. La seconde sorte est, lorsque de propos délibéré, mais  
sans savoir ni | prévoir ce qui pourra arriver, l'on fait épreuve de quelque chose;  
Comme lorsqu'à l'exemple des Chymistes, l'on prend avec choix tantôt un sujet, &  
175 tantôt un autre, & que l'on fait sur chacun d'eux toutes les tentatives dont l'on se  
peut aviser, retenant avec soin ce que l'on a vû réussir à chaque fois, & la maniere  
par laquelle on est parvenu à un certain effet, afin de pouvoir une autre fois employer  
les mêmes moyens, pour parvenir à la même fin. C'est encore faire des experiences de  
cette seconde maniere, quand pour connoître les secrets des Arts on va chez divers  
180 Ouvriers, comme dans les Verreries, & chez ceux qui composent les Emaux, chez  
les Teinturiers, les Orfèvres, & ceux qui manient les differens métaux, pour observer  
comment ils préparent leurs matieres, & comme ensuite chacun d'eux travaille sur  
celles qui leur sont particulieres. Enfin, les experiences de la troisième sorte sont  
celles que le raisonnement prévient, & qui servent à justifier ensuite s'il est faux,  
185 ou s'il est juste; Ce qui arrive, lorsqu'après avoir consideré les effets ordinaires d'un  
certain sujet, & formé une certaine idée de sa nature, c'est-à-dire, de ce qui est en lui  
qui le rend capable de ces effets, nous venons par raisonnement à connoître que si ce  
que nous croyons de sa nature est veritable, il faut necessairement qu'en le disposant  
d'une certaine maniere, il en arrive un nouvel effet, auquel nous n'avions pas encore  
190 pensé; & que pour éprouver ce raisonnement, nous faisons sur ce sujet ce que nous  
avons cru capable de lui faire produire cet effet.

Or il est très-évident, que cette troisième | sorte d'experience est particulièrement  
utile aux Philosophes, parcequ'elle leur peut faire découvrir la verité ou la fausseté  
des opinions qu'ils ont conçûes. Et quant aux deux autres, bien qu'elles ne soient pas  
195 si nobles, on ne les doit pas neanmoins rejeter comme inutiles aux Physiciens: Car  
outre qu'elles étendent toûjours leurs connoissances, elles servent aussi à leur donner  
occasion de faire les premieres conjectures touchant la nature des sujets sur lesquels ils  
s'occupent, & à les empêcher de tomber dans quelques pensées fausses, où ils auroient  
pu tomber sans cela; On se seroit par exemple, bien gardé de conclure generalement  
200 que le froid resserre & condense, si auparavant, par hazard, ou autrement, on avoit  
connu qu'il y a des choses qui se dilatent par le froid.

Le quatrième défaut que j'ai remarqué dans la methode des Philosophes, est qu'ils  
ont negligé les Mathematiques jusqu'à tel point, que dans les Ecoles on n'en enseigne

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187 capable | incapable 1705, *mistakenly*

Philosophy, we may observe that there are three Sorts of Experiments. The first is, 170R  
to speak properly, only the mere simple using our Senses; as when accidentally and  
without Design, casting our Eyes upon the Things around us, we cannot help taking  
Notice of them, without thinking of applying what we see to any Use. The second Sort  
is, when we deliberately and designedly make Tryal of any Thing, without knowing  
or foreseeing what will come to pass; As when, after the Manner of Chymists, we 175R  
make Choice of first one Subject and then another, and make all the Tryals we can  
think of upon each of them, and carefully remember what we have at any Time found  
to succeed, and the Manner in which we arrived at any certain Effect, in Order to  
apply the same Means another Time to produce the same Effect. We also make  
Experiments in this second Way, when we go amongst different Sorts of Workmen 180R  
in Order to find out the Mysteries of their Arts, as Glassmakers, Enamellers, Dyers,  
Goldsmiths, and such as work different Sorts of Metals, and to observe how they  
prepare their Materials, and how every one of them afterwards work upon those  
which belong to them. Lastly, The third Sort of Experiments are those which are  
made in Consequence of some *Reasoning* in order to discover whether *it* was just 185R  
or not. As when after having considered | the ordinary Effects of any particular  
Subject, and formed a true Idea of the *Nature* of it, that is, *of That in it which*  
*makes it capable of producing those Effects*; we come to know by our Reasoning, that  
if what we believe concerning the *Nature* of it be true, it must necessarily be, that  
by disposing it after a certain Manner, a new Effect will be produced, which we did 190R  
not before think of; and in Order to see if this Reasoning holds good, we dispose the  
Subject in such a manner as we believe it ought to be disposed in Order to produce  
such an Effect.

NOW it is very evident that this third Sort of Experiments is of peculiar Use  
to Philosophers, because it discovers to them the Truth or Falsity of the Opinions 195R  
which they have conceived. And as to the two foregoing ones, though they be not  
altogether so excellent, yet they ought not to be wholly rejected as of no Use to Nat-  
ural Philosophers. For besides that their Knowledge is continually enlarged by them,  
they are also the Occasion of making the first Conjectures concerning the Nature of  
those Subjects which Natural Philosophers are conversant about; and preserve them 200R  
from some false Notions they might otherwise perhaps have entertained. Thus, for  
Instance, we might have concluded in general, that *Cold contracts and condenses ev-*  
*ery Thing*, if we had not discovered by Chance or | otherwise, that there are Things

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183 Materials] Matters 1723 202 Cold] Gold 1735, mistakenly

pas même les premiers Elemens; Et ce que j'admire, est que dans la division qu'ils  
205 font de toute la Philosophie, ils ne manquent jamais de mettre les Mathematiques  
entre ses parties.

Cependant cette partie de la Philosophie est peut-être la plus utile de toutes, ou  
du-moins celle dont l'utilité est d'une plus vaste étendue: Car outre que les Mathe-  
210 matiques nous apprennent un grand nombre de verités qui peuvent avoir leur usage  
quand on sait bien s'en servir, elles nous apportent encore cet avantage consider-  
able, qu'en exerçant l'esprit à plusieurs demonstrations, elles le forment peu-à-peu,  
& l'accoutument incomparablement mieux à discer- | ner le vrai d'avec le faux, que  
ne peuvent faire tous les préceptes d'une Logique sans usage. En effet, ceux qui  
215 cultivent les Mathematiques se trouvant à tous momens convaincus par des raison-  
nemens ausquels il est impossible de resister, apprennent insensiblement à connoître  
la verité, & à ceder à la raison; De sorte que, si au-lieu de les negliger comme l'on  
fait d'ordinaire, l'on prenoit & rétablissoit la coutume d'appliquer d'abord les enfans  
à cette science, & de les y faire avancer à proportion des autres études, elle serviroit  
220 infiniment à les empêcher de contracter cette opiniâtreté invincible qui se remarque  
dans la plûpart de ceux qui ont achevé leur cours de Philosophie, & qui probablement  
ne sont tombés dans une si pernicieuse disposition d'esprit, que parcequ'ils ne sont  
pas accoutumés à des verités convaincantes, & qu'ils voyent que ceux qui soûtiennent  
en public quelque doctrine que ce soit, triomphent toûjours de ceux qui tâchent de  
225 prouver le contraire; De maniere qu'à leur égard toutes choses ne passent que pour  
des Probabilités. Ils ne regardent pas l'étude comme un moyen pour parvenir à la  
découverte de nouvelles verités; mais comme un jeu d'esprit dans lequel on s'exerce,  
& dont toute la fin n'est que de confondre tellement le vrai avec le faux, par le moyen  
de quelques subtilités, qu'on puisse également soûtenir l'un & l'autre, sans paroître  
230 jamais forcé à se rendre par aucune raison, quelque opinion extravagante que l'on  
puisse défendre. Et c'est en effet le succès ordinaire de toutes les actions publiques,  
où souvent dans la même chaire des opinions toutes contraires sont alternative- | ment  
proposées, & triomphent également, sans que les matieres en soient plus éclaircies,  
ni qu'aucune verité en reste mieux établie.

Mais l'utilité la plus naturelle que les Physiciens peuvent tirer en particulier des  
235 Mathematiques, est qu'elles les accoutument à la consideration des figures, & les  
rendent plus propres à en connoître les différentes propriétés. Je sai qu'il y en a qui  
disent qu'on ne doit pas s'arrêter aux figures, parcequ'elles ne sont point actives;

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221 ne] *deleted 1705, mistakenly*

which are dilated by Cold.

THE fourth Defect that I observed in the Method of Philosophers, is the neglecting 205R  
Mathematicks to that Degree, that the very first Elements thereof are not so much  
as taught in their Schools. And yet, which I very much wonder at, in the Division  
which they make of a Body of Philosophy, they never fail to make Mathematicks one  
Part of it.

NOW this Part of Philosophy is perhaps the most useful of all others, at least 210R  
it is capable of being apply'd more Ways than all the others: For besides that  
Mathematicks teach us a very great Number of Truths which may be of great Use  
to those who know how to apply them: They have this further very considerable  
Advantage, that by exercising the Mind in a Multitude of Demonstrations, they form 215R  
it by Degrees and accustom it to discern Truth from Falsehood infinitely better,  
than all the Precepts of Logick without Use can do. And thus they who study  
Mathematicks find themselves perpetually convinced by such Arguments as it is  
impossible to resist, and learn insensibly to know Truth and to yield to Reason;  
insomuch that if instead of neglecting them, as is usually done; it were an established  
Custom, to make Children apply themselves to this Science at first, and to improve 220R  
them in these Studies as much as we do in others; it would be of vast Use to hinder  
them from contracting that invin- | cible Obstinacy in their Opinions which we see  
in the greatest Part of those who have compleated their Course of Philosophy; who  
probably would not have fallen into so pernicious a Temper of Mind, if they had been 225R  
accustomed to, and familiar with convincing Truths; and not seen those who maintain  
in publick any Doctrine whatever, continually triumph over those who endeavour to  
support the contrary; so that all Things seem to them only mere Probabilities. They  
do not look upon studying as a Means to discover new Truths, but only as a Piece  
of Wit to exercise themselves in, the only End of which is so to confound Truth with 230R  
Falsehood by Means of some subtle Distinctions, that the one or the other may be  
equally maintained, without ever being compelled by any Reasons to yield, let the  
Opinion they defend be never so extravagant. And indeed this is the Event of all  
publick Disputes, where very often Opinions directly contrary to each other, are by  
Turns proposed from the same Chair, and equally triumphed in, without making  
Matters at all clear or establishing any Truth thereby. 235R

BUT the great Advantage that natural Philosophers have from Mathematicks  
in particular, is, that they are thereby accustomed to the viewing of Figures, and

Mais encore que d'elles-mêmes elles n'agissent pas, il est certain néanmoins que leurs  
différences rendent les corps que l'on met en action, capables de certains effets qu'ils  
240 n'auroient pu produire sans cela. Ainsi un couteau étant aiguisé, devient capable  
de couper autrement qu'il n'auroit fait; & les divers outils des ouvriers deviennent,  
par leurs différentes figures, propres à produire les différents ouvrages que l'on fait  
par leur moyen, Or si la figure des corps que leur grosseur soumet à nos sens, sert  
tant aux effets qu'ils produisent, la raison veut que l'on croie que les parties les  
245 plus imperceptibles de la matière, ayant chacune leurs figures, sont aussi capables  
de certains effets à proportion de leur grosseur, semblables à ceux que nous voyons  
être produits par les corps les plus grossiers.

Mais sans entrer dans un plus grand détail touchant l'utilité des Mathématiques,  
ne devrait-il pas suffire, pour obliger à s'y appliquer davantage que l'on n'a fait par  
250 le passé, de considérer que c'est par leur moyen que les Philosophes modernes ont  
découvert tout ce que l'on sait de plus beau, & de plus particulier | dans la Physique?  
Et de même, que ç'a été par leur secours, que dans tous les siècles, les plus célèbres  
Artisans ont fait toutes ces belles découvertes, dont nous avons l'avantage de jouir  
aujourd'hui, & qui font toute la richesse de nos Arts & toute la commodité de notre  
255 vie? Peut-être croira-t-on au contraire, que ces mêmes Artisans, dont il y a grande  
apparence que la plupart ne se sont pas trop appliqués à l'étude de cette science,  
justifient qu'elle n'est pas si nécessaire que je le voudrais persuader: Mais sur cela il  
y a deux choses à considérer; La première, que comme il y a une Logique naturelle  
dans tous les hommes, il y a aussi une Mathématique naturelle, qui selon que leurs  
260 génies se trouvent disposés, les rend plus ou moins capables d'inventer; La seconde,  
que si le génie seul, conduit par les seules lumières naturelles, peut mener si loin,  
l'on doit beaucoup plus espérer du même génie, s'il joint l'étude des Mathématiques  
à ses lumières, que s'il néglige cette étude. En effet, toutes les propositions des  
Mathématiques ne sont que des vérités que le bon sens a fait connaître à ceux qui  
265 s'y sont appliqués; Et ceux qui s'y trouvent naturellement propres, feroient mal de  
négliger ce que les autres ont déjà trouvé: car c'est le moyen le plus sûr pour trouver  
quelque chose de nouveau, que de savoir ce qui a déjà été trouvé, & comment il l'a  
été par les autres.

Toutesfois, je ne mets pas au rang des Inventeurs ceux à qui le hasard a fait  
270 rencontrer ce qu'ils ne cherchoient pas; comme il arriva à cet Ouvrier, qui refroidissant  
tout-à-coup dans de l'eau un morceau d'acier, qu'il avoit | auparavant fait rougir dans

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242 différents ouvrages] différentes choses 1671 267 comment] comme 1705

enabled to understand the different Properties of them. I know it is here objected by some, that we ought not to stop at Figures, because they are not *active*. But though they are not | *active* in themselves, yet it is certain notwithstanding that their *Differences* make Bodies, which we put into Action, capable of certain Effects, which otherwise they could not have produced. Thus a Knife by having an Edge set upon it becomes capable of cutting, which before it was not; and Workmens Tools, by their different Figures, are fitted to produce those different Works which are made by the Help of them. And if the Figures of Bodies which come under our Senses are so necessary to the Effects which they produce, it is reasonable to think that the most imperceptible Parts of Matter, seeing they have every one a certain Figure, are also capable of producing certain Effects in Proportion to their Bigness, like those which we see produced by the grossest Bodies.

BUT not to enter too far into Particulars concerning the great Use of Mathematicks, Is it not enough to put us upon applying ourselves more to them than we have hitherto done, to consider that 'tis by their Means that the modern Philosophers have discovered all that is excellent and peculiar in natural Philosophy? And also that it is by the Help of Mathematicks, that the most celebrated Artists in every Age have made all those noble Discoveries, the Use of which is so advantagious to us at this very Time, and which make all the Variety of Arts and all the Conveniences of Life. It may be some may think on the contrary, that these very Artists, | the greatest Part of whom it is very probable have not much applied themselves to this Science, will justify it, that it is not so necessary as I would persuade them. But here there are two Things to be considered: First, that as there is a natural Logick in all Men, so is there also natural Mathematicks, which according as their Genius's are disposed, make them more or less capable of Invention. Secondly, That if their Genius alone, conducted only by natural Light, will carry them so far, we cannot but hope greater Things from the same Genius if the Study of Mathematicks be added to its natural Light, than if that Study be neglected. And indeed all the Propositions in Mathematicks, are only so many Truths, which those, who apply themselves to them, come to the Knowledge of by good Sense. And they who find themselves naturally disposed to it, do very ill to neglect what others have before discovered: For it is the most certain Way of finding out any Thing new, to know all that has been before found out by others, and the Manner how it was found out.

HOWEVER, I don't put them upon the Rank of Inventors who have met with

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266 them] it 1723

le feu, s'aperçût que cet acier étoit en un moment devenu incomparablement plus dur qu'il n'étoit auparavant. Sans doute que cette maniere dont on a trouvé la trempe de l'acier, est heureuse & utile; Mais l'ouvrier à qui ce bonheur est arrivé, ne merite  
275 pas le nom ni le titre d'inventeur, comme le meritent beaucoup d'autres, qui ne sont point redevables au hazard de la gloire de leurs inventions, comme par exemple celui qui a inventé le fusil qui s'applique ordinairement à une arquebuzé; Etant certain que celui-là avoit, pour ainsi dire, toute la machine du fusil dans sa tête, avant que d'en faire effectivement la moindre piece; au-lieu que celui qui a le premier trouvé le  
280 moyen de tremper l'acier, a rencontré, comme j'ai dit, une chose qu'il ne cherchoit pas.

Enfin, que les Mathematiques soient d'une très-grande utilité pour les autres parties de la Philosophie, je n'en veux point d'autre témoignage que celui des plus celebres Philosophes de l'antiquité, qui ne se sont pas contentés d'en parler avantageusement dans leurs écrits, mais qui en ont fait usage eux[-]mêmes. L'on sait  
285 assez que Platon avoit fait écrire sur la porte de son école, que personne n'y entrât qu'il ne fût Geometre; Et ceux qui ont pris la peine de lire les Ouvrages d'Aristote, ont pû remarquer les diverses applications qu'il fait des Mathematiques en plusieurs endroits; De sorte que ceux qui n'en savent pas au-moins les Elemens, ne sauroient  
290 se vanter de pouvoir entendre les écrits de ce Philosophe.

Plus je considerois ces quatre defauts de la conduite des Philosophes, & plus je voyois qu'il étoit impossible de parvenir à la connoissance des verités Physiques, à moins que de s'en corriger; Et il me sembloit que cela ne me devoit pas être fort difficile: Car outre que j'avois déjà quelque habitude aux Mathematiques, & que  
295 je m'étois assez accoutumé à suivre plus en cela la raison que l'autorité, je ne me sentois pas assez amateur de mes raisonnemens pour negliger les experiences, ni assez attaché aux experiences, pour ne pas laisser aller mes raisonnemens au-delà de ce qu'elles découvrent.

Mais si cela suffisoit pour me devoir porter à cultiver la Physique, & même pour  
300 me faire esperer de pouvoir servir en quelque façon au progrès de cette science, je remarquois un cinquième defaut, non pas dans la conduite de ceux qui s'y appliquent, mais dans celle de plusieurs qui lisent leurs ouvrages, qui me faisoit croire qu'il n'étoit pas avantageux d'écrire pour le public sur les matieres de Physique, & que c'étoit trop s'exposer. En effet, cette jalousie qui s'éleve ordinairement contr'eux, & cette maniere  
305 desobligeante, avec laquelle ceux qui sont incapables de trouver rien d'eux-mêmes, reçoivent les productions d'esprit de ceux qui tâchent d'aller plus loin que le commun,

something by Chance which they did not search after: As was the Case of that Workman who by cooling on a sudden in the Water a Piece of Steel which he had heated red-hot, found it in a Moment very much harder than it was before: It was without doubt a very | lucky Thing to find out this Way of tempering Steel; but the Workman who had the good Fortune to hit upon it, does not deserve the Name or Title of an Inventor; as a great many others do who are not beholden to Chance for the Glory of their Inventions: As for Instance, the Person who first invented a Firelock to a Gun; for it is certain that this latter had the whole Engine in his Head, if I may so speak, before he made the least Part of it, whereas the other found out the Way of tempering Steel, by hitting upon a Thing, as was before said, by Chance, which he did not search after. 275R 280R

*Lastly*, THAT Mathematicks are of very great Use in the other Parts of Philosophy, we need no other Testimony than that of the most celebrated antient Philosophers, who not only speak honourably of them in their Writings, but do also make use of them themselves. It is sufficiently known, that *Plato* caused it to be written over his School Door, *That none but Geometricians should enter in there*. And they who have taken the Pains to read over the Works of *Aristotle*, have taken Notice of the several Applications he has made of Mathematicks in many Places; so that they who do not understand the Elements at least, have no great Reason to boast of their being able to understand the Writings of this Philosopher. | 285R 290R

THE more I consider these four Defects in the Method of Philosophers, the more I find it impossible to come to the Knowledge of philosophical Truths, without correcting them. And this does not appear to me to be very difficult; for though I had made some Proficiency in Mathematicks, and accustomed my self to follow Reason rather than Authority, yet I did not find my self such a Lover of my own Reasonings, as to neglect Experiments, nor so bent upon Experiments, as not to suffer my Reason to go beyond what they discovered. 295R

BUT though this was sufficient to put me upon improving natural Philosophy, and to make me hope that I might be able in some Measure to help forward the Progress of this Science; yet I observed a fifth Defect, not in the *Method* of those who study Philosophy, but in *that* of a great many who read their Works; which made me think, that to publish any Thing upon natural Philosophy, was so far from being any Advantage, that it was but too much to expose one's self. For that Aversion which is usual against such Persons, and that disagreeable Manner in which those who are incapable of finding out any Thing themselves, receive the Writings of such 300R 305R

mettent le plus souvent leur reputation au hasard: Car à peine un Philosophe a-t-il fait present au public de quelque fruit de ses veilles, qu'aussi-tôt quelque inconnu, qui se veut signaler, s'applique plutôt à le combattre qu'à l'entendre: Et de là viennent ces petits discours, ou dissertations, pour la plûpart anonymes, qui ne manquent pas de paroître au jour, où l'on ne trouve pour l'ordinaire que des injures & des railleries froides, & dans lesquelles ne pouvant détruire des verités solidement établies, on prend le parti de tâcher de les tourner en ridicule, par l'opposition de quelque vieille maxime, ou erreur populaire, qui flate les oreilles du commun des demi-savans, & qu'ils sont accoutumés de recevoir sans preuve. Mais ce qu'il y a en ceci de plus singulier, est, que ces Ecrivains n'attaquent pour l'ordinaire les ouvrages des autres, que parcequ'ils les croient contraires à Aristote; Et cependant, comme ils n'ont rien lu bien souvent des écrits de ce Philosophe, hors les citations qu'ils ont trouvées dans leurs leçons de Physique, il arrive fort ordinairement que ce qu'ils s'efforcent ainsi de refuter, sont des choses qu'Aristote même a dites en termes exprès.

On peut dire assurément que l'Antiquité a rendu plus de justice à l'industrie des hommes, & c'est sans doute en partie pour cela que dans ces premiers siecles la Philosophie a fait quelque progrès; Bien loin de souffrir alors que temerairement & sans raison on décriât ceux qui faisoient de nouvelles découvertes, chacun sait qu'il y avoit des récompenses publiques destinées pour eux, jusqu'à leur élever quelquefois des statues, tant on étoit persuadé en ces temps-là, que l'honneur étoit ce qui contribuoit le plus à l'invention des Arts.

Il est vrai que dans notre siecle cette maxime semble se réveiller & se rétablir; Mais quoique les puissances autorisent & favorisent les Arts & les Sciences, le long engourdissement dans lequel ont vécu depuis tant de siecles tous ceux qui se sont appliqués à la Physique, les a tellement accoutumés à se contenter de ce qu'ils ont reçu de leurs Prédecesseurs, qu'il suffit de leur proposer une chose nouvelle, pour rendre & la chose & la personne même odieuse. Mais pour détruire ce fondement, ou plutôt ce prétexte d'aversion, il faut leur faire comprendre qu'on se trompe ordinairement dans ce reproche que l'on fait de la nouveauté: Car si une chose est vraie, elle ne sauroit être nouvelle, n'y ayant rien de si ancien que la verité; Et c'est la seule découverte de l'erreur qui lui est opposée qu'on peut dire être nouvelle. Faute de bien distinguer ces deux choses, nous voyons quelquefois certaines gens qui s'écrient ridiculement qu'on renverse la nature, lorsqu'on ne fait que renverser une fausse opinion dont ils sont prévenus; Mais quoique ces gens-là ne soient pas trop bien fondés en raison, le

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**326–327** ce qui contribuoit le plus à l'invention] en effet la nourrice 1671

as attempt to exceed what is common, often hazard the Reputation of the Author. For scarce can a Philosopher present the Publick with any Fruits of his Studies, but some unknown Person who has a Mind to signalize himself, attacks | them before he understands them. And hence come those trifling Discourses or Dissertations, for 310R  
the most Part anonymous ones, which never fail immediately to appear, wherein are seldom any Thing else but Reproaches and very low Jests; and not being able to overthrow Truths that are so firmly established; they try to turn them into Ridicule, by showing that they are contrary to some antient Maxim or popular Error, which tickle the Ears of half-witted People, who are accustomed to take Things without 315R  
any Proof: And that which is very remarkable here, is, that these Writers for the most Part attack the Works of others only because they think them contrary to *Aristotle*; and yet because they have read nothing of this Philosopher but only those Citations which they found in their philosophical Lectures, it very often happens that the Thing which they thus attempt to confute, is what *Aristotle* himself has 320R  
said in express Terms. We may safely affirm, that the Antients did more Justice to Men's Labours, and without doubt it was in a good Measure owing to this, that Philosophy made some Progress in the first Ages of it; so far were they from suffering those who had made any new Discoveries, to be cried down at a Venture and without any Reason; every Body knows that there were publick Rewards appointed for such; 325R  
even to have sometimes Statues erected to them; so firmly were they persuaded in those Times that Ho- | nour contributed most to the Invention of Arts.

IT is true indeed, that this Maxim seems to be revived and re-established in our Age. Yet though Princes have by their Authority approved and favoured Arts and Sciences, the long Stiffness which they who studied natural Philosophy have in so 330R  
many Ages contracted, have so accustomed them to rest satisfied with what they received from their Predecessors, that the very proposing any new Thing, is enough to render both the Thing and him that proposes it odious. Now to take away the Foundation or rather the Pretence of this Aversion, such Persons ought to know, that this Reproach of Novelty is generally a great Deceit: For if a Thing be true, it 335R  
cannot be new, because nothing is so ancient as Truth, and it is the Discovery of the opposite Error only that can be said to be new. For Want of rightly distinguishing these two Things, we often see some Persons crying out that we overthrow the Order of Nature, when we only overthrow a false Opinion which they were prejudiced in. But though such Sort of Persons have not much Reason on their Side, yet the Credit 340R

credit & l'autorité qu'ils peuvent avoir sur les autres, est toujours cause que leurs exclamations font impression sur l'esprit de plusieurs; Et c'est toujours un sujet de déplaisir pour ceux qui n'ont point d'autre dessein que celui de contribuer à l'utilité du public.

345 Quelle douleur n'a-ce pas été, par exemple, à Hervée, de voir que pendant sa vie on ait si mal reçu la découverte qu'il avoit faite de la circulation du sang, dont le mouvement est tout autre que l'Antiquité ne l'avoit cru? Certainement on ne pouvoit témoigner trop de reconnoissance à un homme qui desabusoit le monde d'une vieille erreur, & qui par la verité qu'il établissoit, faisoit voir plus clair que le  
350 jour, que presque toute la theorie de l'ancienne Medecine étoit fausse. Cependant au-lieu de remercimens, combien sa | doctrine lui a-t-elle fait d'ennemis? J'avoue donc encore un coup, que voyant combien on s'élevoit aisément contre les meilleures choses, quand le malheur d'avoir été de tout temps ignorées les faisoit passer pour nouvelles, je ne me proposois pas d'entretenir jamais le public de celles que je pourrois  
355 un jour apprendre, soit de moi-même, soit par la lecture des ouvrages de quelques Modernes. Mais j'ai cru au-moins qu'il ne seroit pas impossible que j'avançasse un peu plus qu'on ne fait communément dans la connoissance des choses naturelles, si je m'empêchois soigneusement de tomber dans aucun des defauts que j'avois remarqués dans la maniere dont on avoit fait cette étude jusqu'à présent. Et en effet, ayant passé  
360 quelques années à lire les Anciens & les Modernes, mais avec une ferme resolution de ne les suivre, qu'autant que je verrois que les uns ou les autres auroient raison, il me sembla que je n'avois pas été entierement frustré de mon attente. Mais pendant que je tâchois ainsi à m'instruire par la lecture des livres, & par la conversation des Savans & de ceux qui excellent dans les Arts, je ne laissois pas d'exercer toujours  
365 ma raison; méditant en moi-même sur divers sujets, & tâchant toujours de fonder mes raisonnemens sur des verités de Mathematique, & sur des experiences certaines; Et heureusement il se trouva que j'avois conduit ce dessein jusqu'à tel point, que plusieurs de mes amis, de l'esprit desquels je voyois que tout le monde faisoit une estime singuliere, me conseillerent d'en faire part aux autres dans des conferences,  
370 ou du moins dans des entretiens familiers. Je puis dire que j'eus bien de la peine | à m'y resoudre, parceque je me défois de moi-même, & ne me croyois pas assez bon Orateur pour entreprendre ainsi la cause de la verité devant plusieurs. Cependant je me laissai vaincre; & bien que je sentisse qu'il me manquoit bien des talens, je cru

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343 dessein que celui] volonté que celle 1671 356 j'ai cru] je crû 1671 357 qu'on] que l'on 1671

and Authority which they may have over others, is the Cause of their Exclamations always making an Impression upon the Minds of a great many; and this must ever be disagreeable to those who have no other Design, but to contribute to the Publick Good.

WHAT a Vexation must it be to Dr. *Harvey*, for Instance, to see all his Life long, 345R  
how ill the Discovery he had made of the Circulation of the Blood, was received;  
the Motion of which was quite different from what the Ancients thought? Surely  
we cannot show too great an Acknowledgment to a Man who had undeceived the  
World of an ancient Errour, and by the Truth which he established, made us see as  
clear as the Day, that almost all the Theory of the Physick of the Ancients was false. 350R  
But how many Enemies has this Doctrine got him instead of Thanks? I solemnly  
declare therefore, that upon seeing what Liberty is taken to oppose the best Things,  
because the Misfortune of Mens having always been ignorant of them, made them to  
be thought new; I laid aside the Thoughts of ever entertaining the Publick with any  
Thing of my own, or what I learned from the Works of some modern Writers. But 355R  
thus much I thought at least, that it was not impossible to advance a little further  
than is generally done in the Knowledge of Natural Things, if I carefully avoided  
falling into any of those Defects which I observed in the Method this Study was in at  
present. And indeed having spent some Years in reading the Ancients and Moderns,  
but with a firm Resolution not to follow them any further than I could see the Rea- 360R  
| sons of each of them; it appeared to me that my Design was not entirely frustrated.  
But while I was thus instructing my self by reading Books, and conversing with  
learned Men, and those that were excellent in any Art, I never laid aside the Use of  
my Reason, but considered the several Subjects, and endeavoured always to ground  
my Reasons upon mathematical Truths, and sure Experiments. And so good Success 365R  
had I in carrying on my Design, that a great many of my Friends, whose Abilities  
all the World, I saw, had a great Value for, advised me to communicate it to others  
by publick Conferences, or at least by private Conversation. I must fay, that it was  
very difficult to persuade my self to this, because I am distrustful of my self, and do  
not think my self Orator good enough to undertake to plead the Cause of Truth thus 370R  
publickly. However, I suffered my self to be over-ruled; and though I was sensible  
I wanted a great many Talents, yet I submitted to my Friends, who assured me,  
that if the Things were plainly proposed, and in a mathematical Way, they would be

mes amis, qui m'assûrèrent que proposant les choses simplement, & dans un ordre  
375 Mathématique, elles pourroient plaire du moins aux esprits les mieux faits. En effet,  
ce conseil a réussi: Car non seulement on a pris plaisir à ces conférences, mais même  
on a souhaité que j'en misse les sujets par écrit. Et c'est pour avoir encore acquiescé à  
ce sentiment de mes amis que je me suis à la fin apperçû qu'insensiblement j'avois fait  
un livre; Mais parceque les copies s'en étoient tellement multipliées, qu'il étoit comme  
380 devenu public, & qu'il s'y étoit glissé beaucoup de fautes, cela m'a fait resoudre à le  
revoir plus soigneusement, afin de lui donner toute la perfection dont je suis capable.  
Ceux qui le liront pourront aisément reconnoître, que je n'ai rien négligé de ce que  
les Anciens nous ont appris de bon.

J'ai pris d'Aristote toutes les notions generales, soit pour l'établissement des  
385 principes des choses naturelles, soit aussi pour ce qui regarde leurs principales pro-  
priétés. Et me contentant de rejeter le vuide, & les atomes, ou insecables d'Epicure,  
qui étoient des choses contraires à ce que je croyois solidement établi par Aristote,  
j'ai appris de lui à considerer avec le plus de soin qu'il m'a été possible, les différentes  
grosseurs, les figures, & les mouvemens des parties insensibles, dont les Etres sensi-  
390 bles sont composés. Ce que j'ai fait d'autant plus volontiers | que toutes ces choses  
ont une liaison & une relation necessaire avec la divisibilité de la matiere, que je  
reconnoissois avec Aristote, qui ne resout lui-même guere de questions particulieres,  
qu'il ne fasse considerer la grosseur, la figure, & le mouvement des parties des corps,  
& les pores qui sont entr'elles; Mais ce qui m'a le plus déterminé à m'attacher à cette  
395 consideration, a été, que pouvant ce me sembloit douter avec fondement de la verité  
de certaines qualités & vertus que l'on a de coutume d'attribuer à divers Etres, je  
ne croyois pas que l'on eût même raison de douter qu'il y eût en eux des parties  
insensibles, ni que je pusse me tromper en assûrant que toutes ces parties avoient  
chacune leur grosseur & leur figure particuliere.

400 Outre ces premieres lumieres que j'ai tirées de l'Antiquité, j'ay recueilli encore  
plusieurs autres verités des plus illustres Philosophes modernes, dont les noms se  
liront dans leurs lieux. Mais celui qui a le plus contribué à la composition de cet  
Ouvrage, duquel cependant le nom ne se trouvera nulle part, parcequ'il l'eût fallu  
trop souvent repeter, est le celebre M. Descartes, dont le merite se faisant de plus  
405 en plus reconnoître chez toutes les Nations de l'Europe, comme il l'est déjà chez  
plusieurs des principaux Estats, fera avouer à tout le monde, que la France est du  
moins aussi heureuse à produire & à élever de grands hommes dans toutes sortes de

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381 soigneusement | serieusement 1671

acceptable at least to the best Judges. And indeed their Advice succeeded: For these  
Conferences were not only agreeable, but it was wished that the Subjects had been  
put down in Writing. And by consenting to this Opinion of my Friends, I perceived  
that I had insensibly wrote a Book; and because there were so many Copies of it  
about, that it was become, as it | were, publick, and a great many Faults slipp'd in,  
I resolved to review it more exactly, in order to perfect it as much as I could. They  
who read it over, will easily see, that I have overlooked nothing that is good in the  
Ancients. 375R 380R

I HAVE taken all the general Notions from *Aristotle*, either for the establishing  
the Principles of natural Things, or the chief Properties of them: And I have rejected  
*a Vacuum* and *Atoms, or Epicurus's indivisible Particles*, which I think are Things  
contrary to what is firmly established by *Aristotle*; and I have learnt of him to  
consider with the greatest possible Care the different Bignesses, Figures, and Motions  
of the insensible Parts of which sensible Things are composed. And this I was the  
readier to do, because all these Things have a necessary Connexion with, and Relation  
to *the Divisibility of Matter*, which I acknowledge with *Aristotle*, who hardly resolves  
any particular Question, without considering the Bigness, Figure, and Motion of the  
Parts of Bodies, and the Pores which are between them. But that which most of all  
determined me to this Consideration, was, that though there seems to me to be a  
just Ground to doubt of the Truth of some *Qualities* and *Powers* commonly ascribed  
to some Bodies, yet I do not think that there is the same Reason to doubt of their  
being composed of *insensible Parts*, or that I can be deceived in affirming that all |  
these Parts have their particular Figure and Bigness. 385R 390R 395R

BESIDES those Assistances which I had from the Ancients, I have also collected a  
great many other Truths, from the most eminent modern Philosophers, whose Names  
you may find in their Places. But the Person whom I have most of all made Use  
of in this Work, and whose Name I have not mentioned at all, to avoid perpetual  
Repetition, is the famous *Cartes*; whose Merit, by which he becomes more and more  
known to all the Nations in *Europe*, as he has long been to many of the principal  
States, will draw a Confession from the whole World, that *France* is at least as happy  
in producing and educating great Men in all Sorts of Professions, as ancient *Greece*  
was. 400R 405R

I HAVE divided this Work into four Parts. The first treats of natural Bodies  
in general, and their principal Properties, such as *Divisibility, Motion and Rest, of*

professions, que l'a été l'ancienne Grece.

J'ai divisé tout mon Ouvrage en quatre parties. Dans la premiere, je traite en  
410 general du corps naturel, & de ses principales propriétés, comme de la divisibilité,  
du mouvement, & du | repos, des Elemens, & des qualités sensibles; & je me suis  
particulierement arrêté à expliquer les qualités de la vûe; Et sur ce sujet seul, je  
me flatte d'avoir plus ramassé de verités dans huit ou neuf Chapitres, que n'en  
contiennent plusieurs gros volumes qui traitent de l'Optique, de la Dioptrique, & de  
415 la Catoptrique à la façon des Anciens.

Dans la seconde, je traite du systême du monde, ou de la Cosmographie; ce que  
j'ai estimé plus utile que les questions generales qu'on a coutume de proposer dans les  
Physiques ordinaires, qui servent de commentaires aux livres qu'Aristote a intitulés,  
*du Monde*. J'y traite aussi de la nature des Astres, & de leurs influences; Et après  
420 avoir expliqué en quoi consiste la pesanteur & la legereté, dont faute de prémices je  
n'avois pu parler dans la premiere partie, je finis par l'explication du flux & du reflux  
de la mer.

J'ai employé la troisième Partie à faire connoître la nature de la terre, & des  
corps terrestres, c'est-à-dire, des corps qu'elle contient, ou qui sont alentour d'elle,  
425 comme de l'air, de l'eau, du feu, des sels, des huiles, des métaux, des mineraux, &  
des metheores.

Enfin, j'ai tâché de comprendre dans la quatrième Partie tout ce que l'on sait  
présentement de plus certain touchant le corps animé.

On pourra remarquer en cet ordre, comme une chose extraordinaire, que j'aye  
430 expliqué assez au long & en détail, dès la premiere Partie de ce livre, toutes les qual-  
ités sensibles, que les Philosophes n'expliquent pour l'ordinaire, & assez brievement,  
qu'à la fin de leur Traité de Phy- | sique, dans les commentaires qu'ils font sur les  
Livres qu'Aristote a intitulés, *De l'Ame*. Ce que j'ai fait, tant à cause que cela sert à  
nous faire connoître nous-mêmes, qu'à cause que par ce moyen je fais qu'on se délivre  
435 de bonne-heure d'une erreur populaire, & d'un préjugé de l'enfance, dont j'ai connu  
par experience que plusieurs ne se peuvent défaire par les leçons qu'on leur en fait  
à la fin de leur cours. En sorte qu'ils rapportent des écoles l'habitude qu'ils y ont  
portée, qui est, d'attribuer leurs sensations aux objets qui les causent en eux, & de  
considerer ces mêmes sensations comme des qualités qui sont en ces objets.

440 Au-reste, on ne trouvera pas que dans tout ce Traité j'aye eu beaucoup de pensées  
opposées à celles d'Aristote; mais il s'en trouvera plus que je ne voudrois, de contraires  
à celles de la plûpart de ses Commentateurs. Et outre celles-ci, on en rencontrera

*Elements, and of sensible Qualities*, and I have particularly insisted upon explaining those which relate to *Seeing*. And I flatter my self that upon this single Subject I have collected more Truths into eight or nine Chapters than are contained in several large Volumes which treat of Opticks, Dioptricks and Catropticks after the Manner of the Ancients. 410R

THE second, treats of *the System of the World, or of Cosmography*, which I thought might prove more useful than the general Questions that are usually proposed in the | common Books of natural Philosophy, which are as it were Commentaries upon *Aristotle's Books concerning the World*. I have also treated of *the Nature of the Stars and their Influences*. And after having explained wherein *Gravity* and *Levity* consist (which I could not speak of in the first Part, not having premised what was necessary,) I conclude this Part with explaining the *Flux and Reflux of the Sea*. 415R

THE third Part is taken up in explaining the Nature of the *Earth* and of *terrestrial Bodies*, that is, of the Bodies contained in it, or which surround it, as *Air, Water, Fire, Salts, Oyls, Metals, Minerals, and Meteors*. 420R

*Lastly*, I HAVE endeavoured in the fourth Part to comprise all that is hitherto, with any Certainty, known of the *Animal Body*.

ONE Thing perhaps will be observed in the Method I have taken *viz.* that I have been pretty long and particular, in explaining, in the first Part of this Book, all the sensible Qualities, which Philosophers usually explain, and that but briefly, at the End of their Treatises of Philosophy, in which they comment upon these Books of *Aristotle's concerning the Soul*. The Reason of which is, because this teaches us to know ourselves, and because hereby we are seasonably freed from a popular Errour, and a Prejudice which we have entertained from our Infancy, which I have known by Experience a great many never to have been able to get rid of, not even after they have gone through | their whole Course of Lectures, but have brought back from the Schools those Habits they carried thither, *viz.* the ascribing their own Sensations to the Objects which cause them, and the considering these Sensations as Qualities in the Objects. 425R 430R 435R

FURTHER, you will not find a great many Things in this whole Treatise contrary to *Aristotle*; but you will find more than I could wish that are contrary to most of the Commentators upon him: And besides this, you will meet with a great many Things, which neither *Aristotle* nor his Followers have treated of at all, which I have however judged more useful than many others which Philosophers have wholly employed themselves in. And in all this I did not think it very ill in me to depart 440R

plusieurs, sur un très-grand nombre de choses dont Aristote ni ses Disciples n'ont pas  
coutume de traiter, que j'ai neantmoins estimées plus utiles que beaucoup d'autres  
445 qui font la principale occupation des Philosophes; Et en tout cela je n'ai pas cru qu'il  
y eût de mal de m'écarter de quelques sentimens particuliers, lorsque j'ai reconnu  
que ces sentimens s'écartoient de la verité.

Et ce qui a beaucoup servi à lever les scrupules que je pouvois avoir en cela, est,  
que venant à comparer les endroits où je me trouve contraire à Aristote, avec les  
450 écrits de ceux qui professent publiquement sa Philosophie, je n'en ai pas trouvé à  
beaucoup près un si grand nombre dans mon Ouvrage, que dans ceux des autres.  
Et | sans en venir à compte, il est aisé de s'en convaincre, si l'on considere qu'il  
n'y a point de question sur laquelle ils ne soient partagés; la moitié prenant presque  
toujours des conclusions toutes contraires à celles que les autres prennent; D'où il  
455 suit, que l'on doit necessairement trouver dans les écrits de ceux qui se proposent  
d'enseigner la doctrine d'Aristote, autant d'endroits contre lui que pour lui.

Mais enfin, quand tous les Philosophes seroient d'accord entr'eux, & avec Aristote,  
je ne voi pas que cette conformité me dût contraindre dans mes sentimens, ni que  
les Philosophes pussent prétendre que je fusse obligé de les suivre, où je suis très-  
460 persuadé & convaincu qu'ils s'égarent: Car puisque c'est leur coutume de proposer  
toutes les matieres qu'ils traitent en forme de questions, cette maniere douteuse  
marque qu'il y a liberté toute entiere de suivre le parti où l'on juge que la raison se  
rencontre. Le temps m'apprendra de quelle façon mes bonnes intentions seront ici  
reçûes. Et cependant je prépare une version Latine en faveur des Etrangers, chez qui  
465 j'ose me promettre un accueil favorable.

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461 maniere] matiere 1705, *mistakenly* 465 favorable] assez favorable 1671

from some particular Notions, when I found that these Notions were disagreeable to Truth.

BUT what has very much abated those Scruples which I had about this Matter, 445R  
is, that when I came to compare those Places in this Treatise which are contrary to  
*Aristotle*, with the Writings of the publick Professors of his Philosophy, I could not  
find near so many in my own Works as in the Works of others. And without enu-  
merating the Particulars, it is easy to be satisfied herein, if we do but consider, that  
there is scarce any Question in Controversy, but one half of them draw Conclusions 450R  
directly contrary to the other half. Whence it follows, that we must necessarily find  
in the Writings of those who | profess to teach the Doctrines of *Aristotle*, as many  
Places against him as for him.

BUT though all the Philosophers did agree with each other and with *Aristotle*,  
I don't see that this Agreement of theirs ought to force me to be of their Opinions, 455R  
nor that Philosophers can pretend that I am obliged to follow them, in what I am  
fully persuaded and convinced they are in the wrong of. For since it is the Custom  
with them to propose the Matters which they treat of, in the Form of Questions, this  
very doubting Manner of theirs shows, that there is a perfect Liberty of taking that  
Side which we think to be most reasonable. In what Manner my good Intentions will 460R  
be received Time will show. However, I am preparing a *Latin* Version for the Use of  
Foreigners, with whom I hope to meet with a favourable Reception.

Præfatio Authoris.

Cum Physici Tractatus, qui hactenus prodière, similes propemodum fuerint, sive materiam spectes, sive methodum; Animo cerno, ut qui hunc manibus versaturi sunt, protinus in admirationem pertrahentur, ubi quantum à cæteris discrepet, perspexerint: quare ut occupatas eorum mentes utcunque liberem, illisque satisfaciam, operæ pretium esse duxi in medium proferre, quæ à me deprehensa sunt in antiquorum Philosophorum Physica, atque rationes reddere contextus hoc in opere observati.

Ab aliquot retro annis varios temporis effectus mente revolvens, quomodo certis rebus id faveat, quarum perfectionem semper promovet: aliis è contra noxium, nativis eas gratiis & ornamentis exuat, censebam Artes, & scientias postremis accensendas non esse, cum ex adverso tantum abest ut iis tempus labem inferat, quin potius illis | gratum fit atque adminiculetur: Nam dum ingens doctorum numerus, qui per ævorum seriem, eandem Artem aut Scientiam pro virili excolunt, propria industria adaugent, novisque luminibus illustant, quæ primævi inventores tradiderunt, vix aliter contingere posse videtur quin Ars illa, aut Scientia, magna incrementa capessat, ac tandem ultimam perfectionis metam consequatur.

Enimvero videbam Artes Mathematicas eo modo sensim augmenta habuisse; quemadmodum quisquis facilè consentiet, si modo perpendat insignes progressus ævo nostro factos à magnis illis geniis, qui ea Scientia claruerunt, & qui Difficultates priorum sæculorum impervias superarunt. Videbam etiam Artium maximam partem, temporis decursu perfectionem consequi, accedente opificum industria, à quibus in singulos dies nova & singularia reperta, quæ quia usu nimis trita & familiaria, pro merito considerationem & laudem non consequuntur: Cum tamen vel è solis machinis fabricæ rerum quæ nobis usui sunt dicatis, unica recens ad inventa, tam singulari artificio excogitata sit, ut laudem omnibus ab Antiquis repertis præcipiat.

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**2** Cum ... fuerint] Tractatum Physicorum qui hactenus emissi sunt, cum ea sit concordia ut vix quidpiam discriminis inter eos invenire sit 1674 **3** Animo cerno, ut] proculdubio 1674 **5** quare ... satisfaciam] Sed occupatas mentes utcunque liberaturus illisque satisfactorius 1674 **7** reddere] tradere 1674 **8-9** quomodo ... quarum] quod modo rebus quibusdam favens, illarum 1674 **9** è] added 1682 **10** exuat] exuit 1674 **11-12** tantum ... adminiculetur] gratum & utile esse debeat, nedum iniurium & labem inferre aptum 1674 **12** qui] added 1682 **17** Enimvero videbam] Revera à me animadversum 1674 **17-18** quemadmodum quisquis facilè consentiet] atque consentiet quisquis 1674 **19-20** à magnis ... etiam] per magna Genia ea scientia præstantia, à quibus difficultates doctissimis priorum sæculorum impervix superatæ sunt: Id quoque à me deprehensum 1674 **24** quæ nobis usui sunt] added 1682

*Præfatio Authoris.*

CUM omnes qui adhuc lucem viderint de ratione Physica Tractatus, fermè simili fuerint tum materiâ tum Methodo, eorum qui hunc lecturi sunt plurimos, immensâ quam reperient huius & illorum differentiâ, initio perculsum iri mihi animus præ sagit. Quocirca ut eorum admirationem quodam modo prævenirem, iisque satis 5R  
facere conarer; necesse habui, tum quæ in Veterum Physicâ animadverterim, tum huiusce operis conficiendi rationem, exponere.

Aliquot iam anni sunt, cùm diversos temporis effectus, aliis nimirum rebus faventis, easque in dies perficientis, aliis contrâ nocentis, easque illo ipso quo antè condecoratæ essent ornatu spoliantis, mecum reputans, concludebam Artes & Scientias 10R  
in posteriorum numero nequaquam esse ponendas; tantumque abesse ut tempus illis quicquam afferret detrimenti, ut non posset eas non maximè promovere. Cùm enim, multis per omnium seculorum seriem eandem Artem seu Scientiam excolentibus, præcedentium inventis aliquid de suâ quisque industriâ adiiciat, novumque lumen afferat; utique ea Ars seu Scientia magnam sibi faciat accessionem & in dies 15R  
perficiatur necesse est. |

Et quidem videbam Mathematicam eo modo paulatim esse excultam. Id quod facilè sibi in animum inducet is, qui illud modò adverterit, quantos nostrâ memoriâ præclara illa ingenia, quæ eâ Scientiâ excelluerunt, illasque superaverunt difficultates 20R  
quas Antiquorum doctissimi sibi fatebantur impervias, in eâdem fecerint progressus. Videbam etiam maximam Artium partem longinquitate temporis perfici, cùm Opifices innumera pulchra inventa quotidie excogitarint, quæ quoniam apud omnes pervulgata sunt, & minùs accuratè perspecta, minoris vulgò quàm par est, æstimantur; Quanquam etiam inter machinas rebus usu communi tritis extruendis, una recens 25R  
inventæ est, tam singulari artificio fabricata, ut in eâ solâ maior sit admiratio, quàm in Veterum inventis omnibus.

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**2** lucem viderint | editi fuerunt 1697 **15** utique] *added since 1710* **17** Et quidem] *Utique 1697, 1702* **18** sibi] *added since 1702* **19** superaverunt difficultates] *difficultates superaverunt since 1702* **20** eâdem] *eâ 1697, 1702* **21** longinquitate temporis] *temporis longinquitate 1697*

Verum ad Philosophiæ examen ubi animum appuli, ac speciatim Physicæ, totus obstupui ubi adeo ieiuna & sterilis à me deprehensa est, ut per viginti & amplius sæcu- | la, ad ævum usque nostrum elapsa, nihil fructus ediderit, nec quicquam vel minimum novum exinde emerit.

30 Nec tamen mentem subiit opinio valedictum esse studio rerum naturalium quasi nullius forent usus, cum ab omni tempore prosperæ valetudini consultum fuerit, eiusque necessitas tanquam eximium vitæ bonum habita, nec quenquam latuerit Medicinam; cuius unicus est scopus Sanitatem tueri, labefactamque instaurare, non alia basi quàm Physica inniti debere.

35 Nec item suspicari licuit eos, qui illam Scientiam excoluerunt, paucioribus ingenii dotibus præditos fuisse quam vulgares Artifices, cum teste experientia, in familiis, in quibus plures educantur liberi, ubi de eligenda vitæ conditione agitur, ii ut plurimum in quibus vividioris ingenii notæ elucescunt, artium liberalium studio addicuntur, aut qui sponte ad eas feruntur; Et non nisi ii tantum quibus hebetius contigit, illiberalibus  
40 destinantur, nec altius assurgunt.

Hinc cogitatio subiit, fortè cognitionem rerum Naturalium humani animi vim superare, ac proinde incassum laborare, ut quæ eius captum excedunt, consequi moliatur: Sed hanc Opinionem illico abdicabam, ubi menti se obtulerunt stupendi ingenii quorundam ævi nostri Philosophorum partus à | quibus intra quadraginta aut  
45 quinquaginta circiter annos, plurima comperta sunt, quæ omnium iudicio difficillima, existimabantur, & quæ nonnulli Humano Ingenio omnino impervia esse credebant.

Quare à me extorta fuit hæc consequentia, hactenus in modo & philosophandi methodo aberratum esse, atque errores inibi commissos, quos emendare nemo satagit, quasi obices fuissent, qui aditum ad veritatem prohiberent.

50 Sedulo ergo incubui in scrutinium causarum erroris Philosophorum: atque examine accuratissimè instituto methodi eorum, initio ducto ab Atheniensium schola ad nostra usque tempora, quatuor meo iudicio censuræ obnoxia mihi visa sunt.

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**26** Verum ad Philosophiæ] Ad Philosophiæ vero 1674 **30–31** quasi nullius forent usus] utpote inutili 1674 **34** debere] added 1682 **36–37** quam . . . ii] vulgaribus artificibus, cum teste experientia, quæ familiæ plures educant liberos, ubi de assignando illis vitæ conditione agitur, aut disciplinæ alicui tradendi, is 1674 **39** Et non nisi ii] Ii vero 1674 **42** ac proinde] atque 1674 **42** ut] qui 1674 **43** moliatur] tentant 1674 **43** hanc Opinionem illico abdicabam] statim abdicata est hæc opinio 1674 **45** plurima comperta sunt] comperta 1674 **46** existimabantur, & quæ nonnulli] imo 1674 **46** esse credebant] credida sunt 1674 **47** fuit] added 1682 **49** fuissent . . . prohiberent] fuisse aditum ad veritatem prohibentes 1674

Cùm autem Philosophiam & præsertim Physicam considerarem, valdè mirabar quid esset quod eam adeo sterilem offenderem, ut iam ampliùs viginti secula elapsa essent, ex quo novi quicquam fuisset inventum.

Nec tamen illud in animum inducere poteram, neglectum rerum naturalium, tanquam inutilium planè, iacuisse studium; cùm scirem sanitatem inter præcipua huius vitæ bona semper habitam, nec id quenquam unquam fugisse, medicinam, quæ in sanitate vel tuendâ vel reficiendâ tota versatur, Physicâ ut fundamento niti debere. 30R

Nec faciliùs adduci poteram, ut crederem, huius Scientiæ cultores minùs ingeniosos fuisse, quàm Mechanicos; cùm notum sit, ex pluribus sub eodem tecto enutritis puerulis, ubi de vitæ instituto eligendo agatur, eos plerunque quorum acutius visum est ingenium, literarum studiis addici, vel eò sponte se conferre; eosque ferè, quibus tardius obtigit ingenium, Artibus Mechanicis addici, & in istâ sorte requiescere. | 35R

Incidit mihi porrò suspicio, rerum naturalium cognitionem captum humanum fortasse superare; ideòque nequicquam in eis rebus laborari, quæ essent ab intelligentiâ nostrâ sensuque disiunctæ. Verùm quum stupenda contemplatus essem recentium quorundam Philosophorum opera, qui quæ vix aut nè vix quidem inveniri posse videbantur, quadraginta vel quinquaginta antè annis invenerunt; istam suspensionem statim reieci. 40R

Ità necessariò concludendum mihi erat, omninò in Philosophandi *ratione* adhuc aberratum esse; *eiusque rationis* vitiis, quæ usque eò irrepserant ut nemini spes esset medicinam isti malo reperiri ullam posse, omnem veritatis aditum, quasi repagulis quibusdam, esse præclusum. 45R

Id igitur mihi negotii dabam, ut in Philosophorum *rationem*, quâ parte vitiosa esset, inquirerem; cùmque eam ab usque; Scholis Atheniensibus ad tempora nostra quâ poteram summâ cum curâ expendissem, quatuor mihi in eâ visa sunt reprehendenda. 50R

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28 eam] illam 1697 45 mihi] added since 1702 51 cum] added since 1710

Ac primo, insignis autoritas illa Antiquis semper in scholis concessa: nam, præter enorme illud discrimen, quod inter illos & Neotericos constituitur, nullo stabil-  
55 itum sit fundamento; quandoquidem ratio nulli non regioni, nulli non ætati competit; certum est, submissionem adeo cœcam erga omnia Antiquitatis decreta, in causa esse, ut excellentia quæque ingenia incauta admissione opinionum tanquam verarum, quæ falsæ esse queunt; facultate postmodum non polleant, illis oppositas dignoscendi ac discernendi; ac proinde illas Veritates detegendi, ab illis dependentes, quas noxia  
60 adeo | mentis præoccupatio deprehendere non patitur. Porro fortiter animo infixæ illa opinio nos Antiquis multum esse inferiores; socordiae quandam speciem inducit, aut diffidentiae, quæ quicquam generosum aggredi prohibet: Nonnullos persuasio urget, rationi limites illic constitui ubi substiterunt, ac possibilitatis metæ collocari, quas illi attigerunt. Hinc præstantissima ingenia officio satisfacisse putant, cum Antiquorum  
65 ratiocinia recolunt, nec propriam mentis vim exercitio acuunt: Et quanquam ingenita fit illis Inventionis facultas, non amplius ad promovendam Physicam conferunt, quàm si Philosophico studio omnino non indulgerent.

Non speciatim meminerim summæ erga Aristotelem reverentiæ, quamvis eo eve-  
hatur loco, ut eum sententiæ cuiuspiam Authorem præscribere sufficiat, quatenus  
70 non solum in dubium revocetur, quod ipsa insinuat & ostendit ratio, sed & ideo repudietur & exulet: Id solum adnotari iubeo conceptam apud plurimos opinionem, illum eorum, quæ in notitiam venire possunt nihil latuisse, nullumque non scientiæ genus in eius libris contineri, in causa fuisse ut plerique è præstantissimis, qui ab eius ævo philosophati sunt, inutiliter librorum eius lectioni se addixerint, absentia  
75 ibi quæsitura, quæ forte, insito ingenii lumine freti nacti es- | sent: Quod si quidam cæteris magis ingenui, ex eius lectione eiusmodi non sperarunt fructum, id semper contigit ut laudis cupido quæsita in explicatione locorum, quæ apud ipsum obscuritate involuta sunt, (vel de industria, quod quidam censent, aut penuria maioris illuminationis) causa sit quod ingenii vires omnes inutiliter exercuerint, omneque otium  
80 & tempus triverint in commentariis edendis super ea, quæ de Physicis tradidit, nullo

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**53** illa] *added 1682* **55** sit] *added 1682* **57** tanquam] *specie tenus 1674* **59–60** ac proinde . . . patitur] *nec proinde cætera quæcunque vera sunt deprehendendi, iis connexa quæ præoccupatio mentis adeo noxia in apertam venire lucem impedit 1674* **61** nos Antiquis] *nos ab Antiquis 1674* **61** inferiores] *degeneres 1674* **62** Nonnullos persuasio urget] *added 1682* **63** constitui] *constituuntur 1674* **63** collocari] *collocantur 1674* **66** amplius] *magis 1674* **67** omnino non indulgerent] *nunquam indulgissent 1674* **68** Non speciatim] *Speciatim vero non 1674* **68–69** quamvis . . . quatenus] *cuius aliquando is est excessus, ut ad solam effati alicuius mentionem 1674* **75** Quod si] *Si vero 1674*

Primò, nimia illa, quâ Veteres in Scholis semper pollebant, Auctoritas. Nam præterquam quod ingens illud discrimen, quo Veteres & Recentiores habiti sunt, iniquum & iniurium est, cùm Rationem sibi omnis locus omnisque ætas vendicet; liquet adeò temerè in Antiquorum sententiam semper eundo fieri, ut acutiora ingenia (opinionibus, quæ falsæ esse possunt, pro veris sæpenumero inconsideratè admissis,) neque contrarias opiniones ampliùs intelligere, neque alias Veritates, quàs adeò perniciosâ præoccupatio animo cerni prohibet, invenire queant. Tum prætereà obfirmata illa opinio, *nos antiquis adeò longo intervallo accedere*, dissidentiam quandam, & ad omnia aggredienda indiligentiam inducit. Extremos rationis limites ibi constitutos arbitramur, ubi illi substiterunt; & metam viribus humanis positam attigisse nos credimus, si illos fuerimus assecuti. Ità | præstantissimi viri, Antiquorum ratiocinationes recolere satis habentes, rationem suam non exercent; & ut ad excogitandum acutissimi, tamen in Physicâ processus maiores non efficiunt, quàm si Studiis se omninò non asservissent.

De singulari quâ *Aristotelem* prosecuti sunt veneratione nihil dicam, quamvis ea aliquando ità immodica fuerit, ut illo Authore non in dubium vocaretur modò quod persuaserit ratio, verum etiam improbaretur. Id tantum observatum velim, insitam hanc multorum animis opinionem, utique *Aristotelem* quicquid sciri potest scivisse, omnemque in illius scriptis scientiam premi; fecisse ut plerique celeberrimorum viro- rum, qui post eum Philosophiæ studuerunt, inutilitèr illius libris evolvendis incumbentes, quod in eis non inerat, quodque ipsi fortè suâ ipsorum perspicaciâ invenire potuissent, quæsiverint. Quòd si nonnulli cæco impetu paulò minùs, quàm cæteri, abrepti, minorem ex *Aristotelis* pertractatione fructum percipiendum expectabant; attamen semper factum est, ut spe laudis ex istis locis explicandis consequendæ, quos ille (vel de industria, ut quidam volunt, vel quòd ipse maiori lumine indigeret) tenebris involutos reliquit, operam & tempus commentariis in eius Physica conscribendis, nullo facto in istâ Scientiâ progressu, frustrà tribuerent. Qui enim ad *Aristotelem* interpretandum aggressi sunt, adeò parum de eius mente convenerunt, ut de locorum

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**52–53** Nam præterquam quod] Præter enim quàm quos 1697 **56** opinionibus] opinionibus illis 1697 **62** præstantissimi viri] prestantissima ingenia 1697 **63** habentes] habentia 1697 **64** acutissimi] acutissima 1697 **69** utique] added since 1710 **74** pertractatione] evolutione 1697 **75** ut ... consequendæ] ut illi spe laudis ex istis locis 1697 **77** reliquit] reliquit, explicandis consequendæ 1697 **78** frustrà] nequicquam 1697

in ea scientia facto progressu. Qui enim Aristotelem dilucidandum susceperunt, tam  
varios sensus illi affinxerunt, ut in divortium omnes scholæ abierint, & in varias partes  
distracta sint circa sensum infinitorum textuum: Si vero in quibusdam convenerint,  
id inde ortum est, quòd Notiones adeò familiares sunt, ut neminem vel quampaucis-  
85 simos latere possint: Hinc factum est, ut omnes in Aristotelis studium potius, quam  
naturæ insudarint, quæ forte non tot mysteriis ac ille, implicita est: Imo mille res  
occurrunt, quas illa nitidè & apertè exhibet iis, qui illas percipere non recusant: sed  
quid! id in more non est, magis Aristoteles & Veteres philosophi exaudiendi sunt; &  
id certè exilis progressus fons est & origo.

90 Secundum, quod physici studii progressum remoratur, est, quod Physica ad-  
modum Metaphysicè tractetur, & quod sæpe tem- | pus teratur in agitandis quæs-  
tionibus adeo abstractis & genericis, ut quamvis omnium Philosophorum circa eas  
esset consensus, id plane inutile futurum esset, in explicando minimo Naturæ effectu:  
Nihilominus tamen utilis scientia ad specialia cito descendere debet: Ad quid, rogo,  
95 exempli gratia longæ illæ & argutæ de divisibilitate materiæ disputationes? Nam  
etsi præcise determinare non liceret divisibilis sit nec ne in infinitum, nunquid satis  
est nosse in partes sat parvas divisibilitatem admittere, quo inserviat omnibus usibus  
necessariis.

Utilis proculdubio inquisitio de natura motus in genere: nec quoque forsitan pror-  
100 sus absonum ad examen eius definitionem revocare, quod sit *Actus Entis in potentia*,  
*quatenus est in potentia*: Sed ne temporis fiat iactura in ventilanda illa quæstione  
& similibus, satis est post aliqualem moram circa disquisitionem notionis generalis  
Motus, examini speciatim subiicere omnes eius proprietates, ita ut quod inde emer-  
surum est, in usum ducatur: Paucis, vellem sedulo indagari id, quod materiam ad  
105 hunc effectum potius, quam ad alium determinat, prætermisso usitato illo more,  
effectus productionem in genere qualitati cuius assignandi: Quoniam ex hac dif-  
ferendi consuetudine oritur, ut verba inania pro rationibus usurpen- | tur, ineptaque  
scientiæ præ vulgo opinio, cum verba illi ignota proferuntur nullatenus essentiam  
rei designantia: Revera exilis indicium est ingenii, & omnia promiscue admittentis,

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**83** distracta] distractæ 1674 **83–84** convenerint ... sunt] concordia fuerint, id totum adscriben-  
dum notionum naturæ, quæ adeo communes 1674 **85** est] added 1682 **87** illa] added 1682 **87–**  
**89** sed quid! ... origo] sed, proh dolor, hæc consuetudini repugnant, aures vacivæ potius Aristoteli  
præbentur & antiquis, Hinc vero origo est tam exilis progressus 1674 **90–91** quod ... & quod]  
ex iis quæ Physices studium promoveri inibent, est tractandi modus, qui metaphysica nimis re-  
sipit, Cum 1674 **91** tempus teratur] tempus tantum teratur 1674 **93** Naturæ] speciatim 1674  
**106–107** Quoniam ... oritur] Hunc enim alius consequitur 1674

ferè innumerorum sensu Scholæ omnes in controversias abierint: Quod si de paucis 80R  
 quibusdam locis convenit, hoc idcirco factum videtur, quòd isti loci notiones adeò fa-  
 miliares continerent, ut vix quenquam fugere possent. Ità operam & studium suum  
 ad *Aristotelem* magis, quàm ad naturam contulerunt; qui obscuriori fortè, quàm  
 ipsa, nocte offunditur. Natura res sexcentas animum attendentibus, clarè & per-  
 spicue exhibet; | Quid autem? Id non est nostræ consuetudinis; Malumus *Aristoteli* 85R  
 & veteribus Philosophis aures dare, ideòque pede tam lento progredimur.

Secundò; tardatur Physicæ progressus, dum de eâ nimis Metaphysicè agitur, &  
 de Questionibus adeò abstractis & generalibus disputatur, ut licèt omnes Philosophi  
 concurrerent, tamen nè in minimo quidem naturæ effectum distinctè & singulatim 90R  
 explicando quicquam promoveretur: Quanquam omnis quidem utilis Scientia ad sin-  
 gularia statim descendere debet. Quorsum, exempli gratiâ, longæ & subtiles illæ de  
*aptâ ad dividendum materiæ naturâ* disputationes? Ut enim accuratè definiri non  
 posset, utrum illa infinitè dividi queat, necne; nonne sufficit si eam in partes satis ad  
 omnes naturæ usus exiguas dividi posse intelligimus? *Motûs* naturam in universum 95R  
 investigare sine dubio utile est, nec forsitan prorsùs inutile in id inquirere, rectè an  
 secùs definitus sit, *Actus rei in potentiâ quatenùs in potentiâ*: Mallem verò, missâ  
 hâc & eiusmodi Questionibus, post brevem de generali Motûs notione disquisitionem,  
 omnes illius proprietates distinctè & singulatim expenderentur, ut quod disceretur ad  
 utilitatem adduci posset. Uno verbo, in id diligentèr inquireretur velim, quid causæ  
 esse possit, quare materia unum effectum potiùs quàm alium obtineat, nec diceretur 100R  
 generaliter, istum effectum a *qualitate* quâdam produci; Inde enim est, quod verba  
 pro rationibus habere assuescunt Philosophi, & se super alios scientiâ excellere in-  
 eptè existimant, si verbis utuntur in vulgus ignotis, & quibus nulla res subiiciatur.  
 Ut verè dicam; credere te eò naturam meliùs quàm alios intelligere, quòd occultas  
 Qualitates esse noveris, & ad omnes quæ de variis naturæ effectibus proponi possunt 105R  
 quæstiones generaliter respondere possis, eos ab istis qualitatibus pendere; parvi est  
 atque humilis inge- | nii. Quid utique interest inter hominis Rustici & Philosophi

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81 hoc idcirco factum videtur] id idcirco factum 1697 84 Natura res sexcentas] Illa sexcenta  
 1697 104 eò] added since 1702

110 in iis, qui fingunt naturam melius esse sibi perspectam, quam cæteris, quia notunt  
dari Qualitates occultas, atque unico generali responso solvunt omnes quæstiones de  
variis naturæ effectibus. Revera, quid discriminis inter responsum à rustico datum  
& à Philosopho, ubi ab utroque quæsitum; unde fiat exempli gratia, quod ferrum  
magnes trahat? Si unus dicat causam se ignorare, alter causam esse in abdita quadam  
115 vi & qualitate? Numquid quæso hæc idem sonant? Annon manifestum quicquid in-  
ter ea est differentiæ hoc esse, quod prior ingenue ignorantiam profiteatur, alter vero  
vanitate turgidus, illam in occulto esse velit?

Tertium vitium, quod in Philosophorum regimine à me deprehensum est, illud  
est, quod quidam perpetuis ratiociniis incumbant, ac tam arcte amplectuntur, quæ  
120 præsertim ab antiquis mutuati sunt, ut experientiam omnem respuant. Alii contra  
amplorum ratiociniorum pertæsi, quorum pleraque erronea sunt, aut è quibus nihil  
frugis elicere est, semper ad experientiam provocant omni repudiata ratiocinatione.  
Extrema autem hæc duo Physicæ progressum | ex æquo cohibuerunt: Enimvero  
in *priorem* errorem prolapsi sunt apertam viam novi quippiam comminiscendi sibi  
125 præcludunt, imo ratiocinium proprium firmandi: Et qui secundum errorem errant,  
ii negata libertate conclusiones eliciendi, notitiam remonent magnæ rerum verarum  
seriei, quam sæpe unica experientia deducere apta est. Hinc utile semper fuerit,  
experientiæ rationem nectere: Nam, quid tandem ex assiduo ratiocinio, & crebrius  
iterato de rebus genericis, quæque vulgo in disquisitionem adducuntur, nullo facto  
130 ad specialia transitu? An hæc via est comparandi notitiam maxime diffusam & cer-  
tissimam? Hinc compertum habemus easdem res semper incudi redditas, nihil vero  
novi emersisse; nec comparatam adhuc certitudinem eorum, quæ tractantur, utut  
generalium. Imo animadversum est ratiociniis arctius adhærentes, quæ Aristotelis  
esse contendunt, perpetuo altercari, & pertinaciter res omnino sibi mutuo oppositas

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110 qui fingunt] qui sibi fingunt 1674 110 sibi] added 1682 113 à] added 1682 116 vero]  
added 1682 123–124 Enimvero . . . sunt] Revera, primi erroris rei maxime 1674 125 Et] added  
1682 131 habemus] added 1682 132 adhuc] added 1682 133 est] added 1682

responsum, si interrogati, exempli gratiâ, quî fiat ut magnes ferrum ad se alliciat, alter se planè nescire, alter virtute ac qualitate quâdam occultâ id fieri dicat? Nonne idem planè sonare hæc responsa liquet? illosque hoc uno inter se differre, quod alter ignorantiam suam ingenuè profitetur, alter eam gloriosius celare studet. 110R

Tertiò, in Philosophorum ratione illud reprehendi; utique alios in ratiocinationibus totos esse, eisque itâ præsidere, (maximè quas ab Antiquis mutuati sunt,) ut nullam in experimenta capienda operam conferrent; alios contrâ, molestarum illarum ratiocinationum, maximâ ex parte vitiosarum vel inutilium, pertæsos, omnia ad experientiam révocanda esse, nec omninò ratiocinandum existimare. Quæ duo extrema, moram ex æquo Physicæ progressui attulerunt. Utiq; qui in priorem horum errorum incidunt, optimam & res novas ex tenebris in lucem eruendi, & ratiocinationes suas confirmandi viam sibi ipsi præcludunt; qui autem in posteriorem, hi negatâ id quod sequitur inferendi licentiâ, impediunt quominus ingens veritatum series, quæ sæpè ab uno experimento deduci possunt, inveniatur. Itâ experimenta cum ratiocinatione miscere, non potest non esse utilissimum. Et enim ratiocinando perpetuùm, idque tantum de rebus generalibus, ut fieri solet; ad diffusam certamque notitiam nunquam pervenietur: Ideòque eadem sæpiùs inculcata videmus, nec quicquam novi repertum; imò illa ipsa, quæ toties pertractata sunt, quantumvis generalia ea sint, nondum satis constare. Videmus etiam eos, qui ratiocinationibus quas *Aristotelis* esse credunt, maximè præsidunt, in varias sententias assiduè distrahi, & opiniones plane contrarias tueri, nec alterius partis rationes, alteram convincere posse: | Ex quo facile apparet, quàm parum in istis solis ratiocinationibus evidentiæ ac certæ cognitionis insit. 115R 120R 125R 130R

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112 utique] *added since 1710* 119 hi] *added since 1702* 126 ratiocinationibus] ratiocinationibus illis, 1697 129 solis ratiocinationibus] ratiocinationibus solis 1697

135 tueri, nec argumenta quibus utuntur adversarios ad partes pertrahere posse: quod certè satis indicat, quantum hæc Ratiocinia, si per se spectentur, parum certitudinis ac evidentiae contineant.

Experimenta ergo ad Physices constitutionem necessaria sunt: eaque res ipsi Aristoteli adeo rara fuit, ut ratio ob quam censuit. | Infantes studio Physico tardius  
140 addicendos esse, hæc fuerit, quod ea ætas paucò rerum usu pollens, nequeat rerum multa experimenta sibi comparare: Ex opposito crediderit facilem illis ad Mathematicas disciplinas patere aditum, eo quòd eæ puris innitantur ratiociniis, quorum capax est humanum ingenium, atque ea ab Experimentis nequaquam pendeant.

Sed vicissim, omne ratiocinium qui respuunt, solique experientiae inhærent, in  
145 alterum extremum priori peius devolvuntur: Nam quid id aliud est, quam à Ratione recedere, & omnia Sensibus largiri, nostramque cognitionem angustis limitibus coarctare? quandoquidem experimenta res tantùm maxime sensibiles & crassiores nobis exhibeant: Ita ut, quo legitima sit rerum naturalium indagatio, necesse sit duos hosce cognoscendi modos individuè cohærere; Ratione, & Experientia simul copulatis.

150 Quo autem melius pateat felix connubii illius successus, & usus qui inde exurgere potest in Physicæ commodum, notandum Experimentorum tres esse species; Primum, ut sic dicam, nihil aliud est, quàm simplex Sensuum usus, ut cùm fortè & inconsulto coniecimus oculos in res, quæ nos circumstant, solòque aspectui acquiescimus, nec cui usui possint applicari, mente revolvimus. Secunda spe- | cies est,  
155 cùm ex proposito, ignari tamen & improvidi quid possit sequi, rei alicuius experimentum instituimus; ut cùm, Chymistarum exemplo, modò hæc modò illa assumitur & eligitur materia; atque omnium probationes, quæcunque in mentem veniunt, instituuntur, sedulo adnotando quicquid subinde successum habuerit, & methodum, qua quempiam effectum consequuti simus, quo deinceps eadem media in usum ducantur,  
160 si de novo periculum faciendum sit, utque idem consequatur finis. Altero item modo experimenta secundæ speciei suscipiuntur, quando, ut arcana Artium nobis pateant, varios adimus opifices, exempli gratia, Vitrarios, & encausto opere celebres;

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**136–137** certè ... contineant] eorum invaliditatis & obscuritatis indicium est 1674 **138** Experimenta] Experientiae 1674 **138** necessaria] necessariae 1674 **141** multa experimenta] multas experientias 1674 **142** eo quòd] quia 1674 **143** ea ab Experimentis nequaquam pendeant] experientiae nequaquam connectatur 1674 **145–148** Nam ... exhibeant] Revera enim omnino à ratione aberrant omnia sensibus concedentes, notionesque nostras angustissimis limitibus concludentes, quandoquidem experientia res tantum maxime sensibiles & crassiores exhibere valet 1674 **151** Experimentorum] Experientiae 1674 **152** Primum] Prima 1674 **156** exemplo] exempli 1674

Experimenta igitur ad Physicam constabiliendam omninò necessaria sunt. Quod *Aristoteles* ipse adeò ratum habuit, ut teneræ adhuc ætatis pueros studio Physicæ idcirco prohiberet, quòd istam ætatem sine experienciâ & rerum usu, minus experientorum cepisse existimaret; Cùm è contrario aditum illis ad Mathematicam patere arbitraretur, quòd ea Scientia in meris ratiocinationibus, quarum intellectum mens humana naturâ capere potest, consistat, nec ab experimentis ullo modo pendeat. 135R

Verùm ex alterâ parte, qui reiectâ omninò ratiocinatione totus erit in experimentis, is ad alterum extremum multò, quàm primum, perniciosius descendet; Sic enim repudiatâ ratione, ad sensum revocabuntur omnia, & cognitio nostra satis angustis finibus continebitur; Quippe experimenta ad crassiorum tantùm & sub sensum cadentium rerum cognitionem nos ducunt. Quamobrem ut in rebus naturæ investigandis viâ & ratione procedatur, duos hosce cognoscendi modos coniugamus, & experientiam cum ratiocinatione sociemus necesse est. 140R

Ut autem quæ ex hâc felici coniunctione secutura fit utilitas, & quantoperè Physica eâ ratione promoveri possit, meliùs intelligamus; observandum est tria esse experientorum genera. Primum genus, si propriè loquemur, nihil aliud est nisi simplex sensuum usus; ut cùm oculorum imprudentiam in corpora circùm obiecta adiicimus, de eo, quam ad utilitatem illa adduci possint, minùs laborantes. Secundum genus est eorum, quæ ut consultò, tamen non proviso eventu, capiuntur; Ut cùm, Chymicorum more, modò in hâc, modò in illâ materiâ, quicquid succurrit periclitamur; | quid singulis experimentis, & quo modo evenit, animo diligenter tenentes, ut eâdem viâ ad eundem finem iterùm perveniri possit. Pertinent etiam ad hoc secundum genus experimenta illa, cùm varios Opifices, ut Vitrarios, Encaustas, Infectores, Aurifices, & eos qui diversa Metalla tractant, adimus; quomodò materiam præparent & suum quisque opus elaboret, observaturi, ut arcana artium præcepta addiscamus. Postremo, Tertium genus est eorum, quæ præcedente ratiocinatione capiuntur, ut eam vel falsam vel aptam esse ostendant: ut cùm perspectis consuentis alicuius rei 145R 150R 155R

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133 sine] absque 1697 142 duos hosce] hosce duos 1697, 1702

item Aurifabros, eósque qui varia tractant metalla, observandi gratia quo apparatu  
materiam sibi subiectam præparent, & quomodo deinceps unusquisque elaboret sibi  
165 peculiarem: Tandem Experimenta tertiæ speciei eæ sunt, quæ antecedit ratiocinatio,  
quæque deinceps in usum ducuntur ad iudicium ferendum verane sit ea necne: Atque  
id contingit, quum in examen adductis ordinariis rei cuiuspiam effectibus, ac con-  
cepta quadam de eius natura idea, hoc est, de Causa, per quam efficax est, & apta  
effectus eiusmodi edere, ratiocinationis deinceps ope cognoscimus, si id quod de eius  
170 na- | tura nobis perspectum, verum est, necesse esse, ut ea certo modo disposita,  
novus inde prodeat effectus opinioni præconceptæ dissentaneus: demum, ad examen  
probitatis illius ratiocinii, dicta in re periculum facimus eius, quod iuxta opinionem  
conceptam, potuit ea ex re eiusmodi elicere effectum.

Notissimum autem est, tertiam illam experimentorum speciem Philosophis ex-  
175 imiè utilem esse, quod eius ope, Veritatem aut falsitatem conceptarum Opinionum  
detegere possint; Et quoad duas priores, quanquam non tanti momenti sint, non  
tamen tanquam Physicis inutiles respui debent. Nam præter usum, quem præstant,  
scientiam eorum promovendo, occasiones quoque subministrant primas instituendi  
coniecturas de Subiectorum natura, circa quæ occupantur: præcaventque falsas opin-  
180 iones proculdubio absque iis nascituras: Sic, exempli gratia, conclusio hæc generica  
prolata non esset, *Frigus constringere & condensare*, si antea, duce fortuna, aut aliter,  
cognitum fuisset res quasdam vi frigoris dilatari.

Quartum Vitium à me annotatum circa Philosophorum methodum, est neglectus  
mathematicarum disciplinarum usus, usque adeo, ut nec in Scholis prima earum  
185 elementa tradantur: hoc vero admirationem | auget, quod in divisione ab iis totius  
Philosophiæ tradita, eæ semper inter partes illius in censum veniant.

Attamen ea Philosophiæ pars omnium forte utilissima est, aut saltem eius naturæ  
cuius utilitas maximæ est latitudinis: Nam præter ingentem numerum Veritatum,  
quas eæ disciplinæ nobis patefaciunt, quæ emolumentum præstant, si dextre in  
190 usum flectantur, id præterea hinc insignis commodi accedit, quod Ingenium in variis

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165 Experimenta] Experienciæ 1674 165 quæ] quas 1674 168 idea] idæa 1674 174 est]  
added 1682 174 experimentorum] experienciæ 1674 176 Et] added 1682 176 tanti] eiusdem  
1674 179 de Subiectorum natura, circa quæ] de natura materiæ subiectæ circa quam 1674  
181 antea] ante 1674 190–191 Ingenium ... assuescat] earum beneficio ingenio per plurimas  
demonstrationes hoc paulatim erudiunt, unde multo citius assuescit 1674

effectibus, & informatâ in animo naturæ eius ideâ, hoc est, *illius rei quæ in eâ inest illosque effectus producit*; ratiocinatione colligimus, si eius naturam animo rectè conceperimus, utique eam certo modo dispositam novum atque improvisum effectum obtinere debere; & deinde hanc ratiocinationem probaturi, illam rem ità disponimus, quemadmodum eam ad istum effectum optinendum disponi oportere iudicavimus. 160R

Iam manifestum est, tertium hoc experimentorum genus Philosophis præcipuè utile esse, quòd eorum ope opiniones iam antè animo insitæ tentari & probari queant. Duo autem reliqua, quamvis minùs nobilia, tamen non a naturæ speculatoribus, tanquam inutilia, continuò reiicienda sunt. Nam præterquam quod illa cognitionem Ipsorum assiduè extendunt; insuper primam etiam naturæ earum rerum, in quarum examinatione Physici versantur, coniecturâ assequendæ occasionem præbent; & impediunt quo minus ipsi errantes quasdam opiniones amplectantur, quas alioqui forsan essent amplexuri. Exempli gratiâ; ab illâ conclusione, *Frigus in universum constringere & densare*, satis præcautum esset, si casu aut quo alio modo compertum esset, quædam corpora Frigore dilatari. | 165R 170R

Quartò, in Philosophorum ratione illud in vituperationem venire observavi, quod Mathematicam usque eò neglexerint, ut in Scholis nè prima quidem illius elementa tradantur; quanquam, quod maximè miror, cùm Philosophiam universam in partes suas distribuunt, Mathematicam nunquam omittunt. 175R

Attamen ea Philosophiæ pars forsan omnium utilissima est; saltem in pures res, quàm reliquæ omnes, transferri potest. Mathematica enim, cùm ingentem veritatum numerum nos docet, quæ, si in loco utare, ad utilitatem adduci possunt; tum illud in primis commodum assert, quod mentem multis demonstrationibus exercitatum paulatim formet, eamque multò meliùs, quàm universa inutilis Logicæ præcepta, verum & falsum discernere assuefaciat: Utique qui in Mathematica studium ponunt, certissimis ratiocinationibus assiduè convicti, veritatem agnoscere sensim discunt, & rationi concedere. Quare si hæc studia non ampliùs iacerent, sed mos ille antiquus 180R

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160 utique] *added since 1710* 164 eorum ope] *illo 1697, 1702* 166–167 Nam ... insuper] Præter enim quàm quod ipsorum cognitionem assiduè extendunt, *1697* 166 illa] *added since 1710* 177 ea] *illa 1697* 181 universa] *omnia 1697*

Demonstrationibus exercendo, illud ita effingunt, ut multo citiùs assuescat veri à falso discrimini faciendo, quam ope præceptorum omnium Logices inutilis: Revera, qui Mathematicas Disciplinas excolunt, cùm singulis momentis, vi Ratiocinationum, quas refellere impossibile est, evincantur, sensim veritas illis se aperit, unde rationi  
195 reluctandi locus non datur: Ita ut si neglectui eæ non traderentur, ex consuetudine ista in usum revocaretur, ut pueri statim illi Scientiæ traderentur, earumque studium ad cæterorum proportionem promoveretur, proculdubio miræ essent efficaciam ad arcendam insuperabilem illam pertinaciam, quæ plerumque eos obsidere observatur, qui Philosophiæ cursum absolverunt, verisimiliter perniosa illa ingenii  
200 dispositione affectos, quòd maturè imbuti non fuerint cognitione Veritatum insuperabilium; Et quod animadvertant quòd qui in Scholis quamvis doctrinam tuentur, triumphum semper reportent de iis qui contrarium probare conantur, ita ut eorum respectu, omnia pro probabilibus tantùm habeantur: Non hi Studia perpendunt tanquam viam, per quam iter est ad novarum Veritatum acquisitionem, sed tanquam  
205 animi exercitium & ludum, cuius finis alius non est, quàm verum falso implicare & confundere, mediantibus quibusdam argutiis, quibus utraque pars æqualiter fulciri queat, nec succumbentis sub rationum pondere unquam speciem exhibere, quantumvis opiniones absurdæ adducantur: Revera successus hic ordinarius est omnium actionum publicarum, in quibus sæpe in eadem cathedra opiniones omnino contrariæ  
210 alternis ventilantur, & æque victoriam reportant, materia tamen nequaquam dilucidata, veritateque in obscuro nihilominus latente.

Verùm utilitas naturæ magis consona, quam Physici ex Mathematicis scientiis speciatim consequuntur, hæc est, quòd familiares inde illis reddantur figurarum considerationes, unde idonei evadunt noscendis variis illarum proprietatibus. Nec me  
215 latet quosdam obiicere Figuris immorandum non esse, quod inefficaces sint: Sed quamvis ex sese | non agant, certum tamen est earum differentias efficere ut corpora

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**193** qui Mathematicas Disciplinas excolunt] disciplinas Mathematicas excolentibus 1674 **193** vi Ratiocinationum] ratiocinationum vi 1674 **197–198** miræ . . . pertinaciam] miri essent effectus in arcenda insuperabili illa pertinacia 1674 **201** quòd] eos 1674 **202** probare conantur] pertinaciter tuentur 1674 **203** hi Studia] Studia ii non 1674 **205** falso implicare] falso adeo implicare 1674 **206** quibus utraque pars] ut utrumque 1674 **209** in quibus] cum 1674 **210** &] added 1682 **212** Verùm utilitas naturæ magis] Utilitas vero naturæ maxime 1674

referretur, ut teneræ adhuc ætatis pueri ad hanc Scientiam operam conferrent, & 185R  
 in hisce studiis, pro ut in cæteris, proficerent; infinitè cautum esset ab invincibili  
 illâ pertinaciâ, quâ plerique eorum, qui stadium philosophicum emensi sunt, obfir-  
 mari observantur: qui, ut verisimile est, nunquam animo fuissent adeò perniciosè  
 obstinato, si ipsis cum certis veritatibus usus & consuetudo esset; nec viderent eos,  
 qui sententiam qualemcunque palam & publicè tuentur, ab adversâ parte certam 190R  
 victoriam reportare; ità ut omnia apud illos pro probabilibus tantùm habeantur.  
 Studium utique non ad novas veritates inveniendas viam esse existimant, sed tan-  
 quam lusionem quandam, quâ ingenium exerceatur, & per quam nihil aliud quicquam  
 quærat, quàm ut vera ac falsa argutiis quibusdam ità confundantur, ut hæc atque  
 illa iuxtâ de- | fendi possint; neque ullo rationum pondere, licet quantumvis absurdam 195R  
 opinionem sustinueris, manus dare coactus videare. Et quidem hic ferè publicarum  
 omnium disputationum eventus; ubi contrariæ opiniones sæpè ex eodem suggesto  
 proponuntur alternis & triumphant, nullâ interim nec illustratâ Quæstione, nec con-  
 firmatâ Veritate.

Verùm ex Mathematicâ hunc proximè & præcipuè fructum percipiunt Physici, 200R  
 quod inde figuris contemplandis, earumque variis proprietatibus intelligendis assue-  
 fiant. Neque me id fugit, nonnullos esse qui dicant, figuris non esse immorandum,  
 quòd non sint *actuosæ*; Verùm enimverò, si *ipsæ* vim in agendo nullam habent, at  
 certè earum *differentiis* corpora quæ moventur, ad certos effectus obtinendos, quos  
 alioqui obtinere non potuissent, apta redduntur. Sic Culter, excitatâ acie, vim se- 205R  
 candi, quâ antè carebat, comparat; & varia instrumenta, figurarum varietate variis  
 operibus idonea fiunt. Iam verò, si corporum præ crassitudine sub sensus nostros  
 cadentium figura, tantam in illorum effectibus rationem obtinet; omninò existiman-  
 dum est tenuissimas materiæ particulas, cùm suas & illæ habeant figuras, effectus

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192 utique] *added since 1702* 200 hunc] illum 1697 201 inde figuris ] illa eos figuris 1697  
 201 earumque] eorumque 1697, 1702 201–202 assuefiant] assuefaciat 1697 203 at] *added*  
*since 1702* 204 *differentiis*] differentiæ, 1697 204–205 effectus ... redduntur] effectus, quos  
 illa alioqui obtinere non potuissent, obtinendos apta reddunt 1697 208 tantam] tantum 1697

motui destinata, idonea fiant certis effectibus edendis, quorum antea incapacia erant: Sic Culter coti affricatus, scindendi novam vim adipiscitur; variaque opificum instrumenta, mediantibus variis illorum figuris, apta fiunt productioni rerum variarum, quæ ex illorum usu emergunt: Unde si figura corporum, quæ ob crassitiam  
220 sensus nostros subeunt, tantos effectus exserit, urget ratio ut credamus, partes materiæ maxime imperceptibiles, cum unaquæque earum sua donetur figura, idoneas quoque esse, pro ratione magnitudinis, certos effectus edere, iis non absimiles, quos deprehendimus à corporibus crassioribus produci.

225 Sed ne Mathematicarum Scientiarum utilitatem specialius prosequamur, nunquid hoc satis est, quatenus in earum studium acrius quam ante impellamur, & incumbamus, adnotasse, earum ope, Philosophos neotericos quicquid elegans & singulare continet Physica, in apertum produxisse? Itidem, earum auxilio, ab omni ævo, celeberrimos Artifices singularia illa, quibus maximo cum commodo fruimur, quæque  
230 artium nostrarum ornamentum sunt, in vitæ maximum commodum, detexisse? Credit forte contra quispiam eosdem Artifices, quorum plurimos verisimile est illius scientiæ rudes esse, de earum exigua necessitate, contra meam sententiam, testimonium laturos: Sed circa hæc duo perpendantur; *Primo*, sicut Logica quædam omnibus à natura insita est, dari quoque Mathematicam naturalem, quæ pro varia  
235 genii conditione, eos plus aut minus ad inveniendum sagaces efficit; *Secundo*, si ingenium humanum solo lumine naturali duce, tam alte penetrare potest multo plura expectanda ab eodem ingenio, studio methemathico imbuto, quam eodem destituto: Etenim propositiones omnes Mathematicæ nihil aliud sunt, quàm Veritates quas naturalis Ratio iis detexit, qui iis se addixerunt: Hinc ii quibus propensio ad illas innata  
240 est, in sua commoda peccant, si id negligant quod ab aliis iam detectum est. Nam securissima via ad quippiam novi reperiendum est, si notitia præsit eorum quæ iam comperta sunt, & quibus mediis alii ea consequuti sint.

Non tamen Inventorum numero eos accenseo, quibus fortuna obiecit id, quod non inquirebant; sicut contigit opifici illi, qui candente chalybe in frigidam subito

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220 Unde si] Si vero 1674 224 crassioribus] crassissimis 1674 225 Sed ... prosequamur] Sed specialius utilitatem Mathematicarum scientiarum non persequuti 1674 226 quatenus] quo 1674 235–236 ingenium humanum] mediante tantum genio 1674 236 potest] licet 1674 237 ingenio] genio 1674 238 Etenim] Revera 1674 238–239 quas naturalis Ratio iis detexit] felicis ingenii partus, in illis 1674 240 id negligant] negligant id 1674 240 est] added 1682 240–241 Nam securissima] Securissima enim hæc est 1674 241 est] added 1682

utique, pro magnitudinis suæ ratione, eorum similes, quos crassiora corpora obtinere 210R  
videmus, posse obtinere.

Cæterùm nè in Mathematicæ utilitate particulatim exponendâ nimius sim, nonne  
eo satis impelli debemus, ut in huius scientiæ studio diligentius versemur; quòd quic-  
quid in Physicâ splendidum, quicquid singulare est, id illius beneficio recentiores  
Philosophi è tenebris in lucem eruerunt? & quòd eidem præclara illa celeberrimorum  
omnium seculorum Artificum inventa debentur, quibus nos iam utimur ad  
Artium ubertatem & elegantiam vitæ. Existimabit fortè è contrario | quispiam, illos  
ipsos Artifices, quorum maximam partem parum operæ in hanc Scientiam contulisse  
verisimile est, eam non adeò necessariam esse, evincere: Sed ad hoc duplex mihi  
succurrit responsum: Primò, ut in omnibus hominibus Logica quædam naturalis  
inest, ità omnium mentibus aliquam natura insitam esse Mathematicam, quæ eos,  
pro ut ante dispositi fuerint, ad excogitandum reddit acutiores: Secundò, si inge-  
nium incultum, solius naturæ luminis beneficio, tantos processus efficere queat; ab  
eodem ingenio, Mathematicæ accessione aucto & instructo, multo præclariora esse  
expectanda. Et verò omnes propositiones Mathematicæ nihil aliud sunt nisi veri-  
tates illæ, quas intelligens iudicium animum attendentibus patefecit. Quod si ii qui  
ad hoc studium natura comparati sunt, quæ alii ante invenerunt, neglexerint; facient  
omnino male. Et enim intelligere quid iam & quo modo inventum sit, certissima est  
aliquid amplius inveniendi ratio. 215R  
220R  
225R

Neque tamen eos in numero Inventorum pono, qui casu & fortuito in id, quod 230R  
non quærebant, inciderint; Ut Opificem illum, qui demersam repente in aquâ chaly-  
bis candentis massulam, temporis momento longe duriolem factam advertit. Felix  
sine dubio & utilis ea chalybis temperationem reperiendi ratio; Attamen Opificem  
eum, cui id cecidit secundum, nomen Inventoris non ità mereri censemus, quemad-  
modum id merentur ii, qui inventorum suorum gloriam fortunæ non debent; ut qui 235R  
sclopleti igniarium primus invenit: Ille enim totam machinam, ut sic loquar, animo

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**210** utique] *added since 1710* **213** eo satis impelli debemus] illud nos satis impellere debet *1697*  
**226–227** ii ... sunt] illi, qui ad istud studium naturâ comparati sunt, ea, *1697* **235** id] illud  
*1697* **235** ut qui] ut ille, qui *1697*

245 immisso, animadvertit eum insignem duritiem, priori multo maiorem contraxisse:  
Proculdubio artificium illud repertum duritiem chalybi inducendi felix est & utile:  
opifex | autem cui bona ea sors contigit, nomine aut titulo Inventoris non est in-  
signiendus, quo digni sunt plures alii, quorum gloria industriæ, non fortunæ debetur.  
Exemplo sit, qui primus igniarium fomitem qui Catapultæ passim admovetur, adin-  
250 venit; Certum quippe est illum, ut ita dicam, totam illam machinam cerebro con-  
ceptam gessisse, antequam minimam organi particulam confecisset; Cum qui primus  
adinvenit modum temperandi chalybem, obviam rem nequaquam quæsitam habuerit.

Tandem, quo pateat Mathematicas scientias maximi esse usus ad cæteras Philo-  
sophiæ partes assequendas, sufficiat hoc testimonium celeberrimorum, & antiquissi-  
255 morum Philosophorum atulisse, quibus non satis fuit earum utilitatem scriptis ex-  
tollere, sed illas ipsi in usum duxerunt: Non ignotum est Platonem portæ Gymnasii  
sui superinscribi voluisse, nemini patere introitum, nisi Geometriæ perito: Ii autem  
quibus *Aristotelis* opera non ignota sunt, adnotare potuerunt, ipsum varios in usus  
mathematicam scientiam adhibuisse: Ita ut, qui eius elementa saltem non callent,  
260 scripta eius se percipere profiteri non debeant. |

Quo sæpius quatuor illa Philosophorum in methodo vitia animo recolui, eo magis  
impossibile esse credidi, quempiam notitiam Veritatum Physicarum posse consequi,  
nisi alia ineatur via. Nec id arduum meo iudicio visum est: nam præter comparatam  
mihi aliquam in Mathematicis habitudinem, atque assuetudinem & propensionem ad  
265 rationem potius quàm authoritatem amplectendam, mihi non innatam esse philau-  
tiam animadvertēbam, ut ratiocinio meo fretus, experientiæ valedicerem, illud huic  
præferens: nec eo modo experientiæ adstrictum, ut ratiocinium abdicarem, cùm illa,  
quæsitam non patefacit.

Id verò si me impellere potuit ad Physices studium excolendum, imo in spem  
270 erigere ope mea quoquo pacto promoveri posse scientiæ illius progressum, ut quin-  
tum præterea Vitium deprehenderem ansam præbuit, non in methodo eorum, qui in

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249–250 fomitem ... adinvenit] fomitem catapultæ admovit 1674 250 est] added 1682 256  
illas] added 1682 256 est] added 1682 257 Geometriæ] Geometriam 1674 258 quibus] qui  
1674 263 est] added 1682

ante informatam habuerit necesse est, quàm minimam eius partem reipsa conficeret; cùm is qui chalybis temperandi rationem primus repperit, casu, ut dixi, in id, quod non quærebat, incidit. |

Postremo, quàm utilis in reliquâ Philosophia sit Mathematica, satis significant 240R  
 etiam veterum Philosophorum celeberrimi; qui non modo in scriptis suis honorifice  
 & graviter multa de illâ prædicârunt, verùm & ipsi eâ sunt usi. Notum est *Platonem*  
 in gymnasii sui limine, *Nemo huc pedem inferat nisi Geometres*, inscripsisse; & qui  
*Aristotelem* evolverunt, observare potuerunt quàm in multis locis ille usus sit Math-  
 ematicâ; Ità ut, qui istam Scientiam, saltem eius elementa, non edidicerunt, nihil 245R  
 habeant, quod in Aristotelis pertractatione gloriantur.

Iam quò hæc quatuor Philosophorum *rationis* vitia mecum magis reputabam, eò  
 clariùs videbam, ad veritatum Physicarum cognitionem perveniri non posse, nisi illa  
 emendaretur. Quod mihi non adeò difficile factu videbatur; Nam præterquam quod  
 in Mathematicæ studio nonnihil profeceram, & rationem potiùs quàm auctoritatem 250R  
 sequi satis assueveram: mihi non videbar is, qui ratiocinationum mearum ità stu-  
 diosus essem, ut experimenta negligerem; aut qui experimentis ità adhærescerem, ut  
 ratiocinationes meas intra illorum fines coererem.

Verùm cùm hoc me satis impellere videretur, ut Physicæ studio me assererem;  
 atque etiam spes aliqua affulgeret, fore ut istam scientiam quodam modo promoverem; 255R  
 occurrit mihi Quintum, non eorum qui Physicæ student, sed eorum qui scripta illo-  
 rum legunt, *rationis* vitium; quod effecit ut crederem, qui libros supra hâc materiâ  
 conscriptos emitterent, eos suæ ipsorum existimationi parum prospicere, & invidiæ  
 hominum se offerre. Et quidem invidia, quâ plerunque utuntur ii, qui hoc enituntur  
 ut super alios excellent; & inofficiosa illorum agendi ratio, qui quæ ipsi facere non pos- 260R  
 sunt, verbis elevant; scriptores in discrimen | existimationis suæ persæpè adducunt.  
 Commodùm enim aliquem lucubrationum suarum fructum ediderit Philosophus, cùm

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237 habuerit] haberet 1697 247 Iam] added since 1702 249 Nam præterquam] Præterquam  
 enim 1697 252 qui] added since 1710 257–258 qui libros ... eos] eos, qui libros supra hâc  
 materiâ conscriptos emitterent, 1697 259 hoc] illud 1697

eam incumbunt; sed in ea plurimorum, qui opera Physicorum manibus versant, quod  
me ad credendum inducebat, haud proficuum esse Res Physicas publico tradere, &  
nimium periclitati eas, qui talia aggredierentur. Revera zelotypia quæ passim inter  
275 eos viget, ingratusque eorum mos, quorum ingenium | ex se infrugiferum, inique  
excipit animi partus eorum, qui vulgus scriptorum superare satagunt, ut plurimum  
famam illorum in discrimen adducit; nam statim ac Philosophus quispiam vigiliarum  
suarum fructum aliquem in publicum emisit, illico ignotus quispiam insurgit, avidus  
famæ, impugnandi studio potiùs, quàm mentem eius concipiendi: Inde illæ disserta-  
280 tiones, aut discursus ab Anonymis ut plurimum emissi, lucis usura gaudent, iniuriis  
& cavillationibus isulsis tumidi, quæ cum ineptæ sint rationibus solidis infringendis,  
studium illorum eo collimat, ut eas ludibrio tentent exponere obiecto veteri aliquo  
axiomate, aut errore vulgari, à quibus semidoctorum aures demulcentur, omnia sine  
confirmatione cum applausu admittentium. Hoc verò hic singulare est, Scriptores  
285 eiusmodi in aliorum opera fere tantum invehì, quod *Aristoteli* adversari existiment;  
Interim, cum sæpe sint ignoti hospites, sint in eius scriptis versati, atque ex cita-  
tionibus tantum in libris Physicis traditis, illis cognitus sit, plerumque accidit, ut  
quod impugnare intendunt, illud conceptis & expressissimis verbis ipse Aristoteles  
tradiderit. |

290 Certò autem asserere licet, Antiquos minus iniquos fuisse erga hominum indus-  
triam; eaque de causa, primis sæculis Philosophiam incrementa sumpsisse: Tantùm  
abest, ut tunc temporis temerè & sine ratione, consuetudinis esset impugnare eos, per  
quos aliquid novi in apertum prodiit, ut potius munera publica decernerentur, imo  
statuæ in eorum honorem erigerentur: adeo illis ratum (felicia tempora!) honorem  
295 revera alere artes.

Verùm quidem est, nostro hoc sæculo morem illum propemodum reviviscere &  
stabiliri; Sed quanquam Dynastæ artium & scientiarum patroni sint & protectores,

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**272–274** quod . . . aggredierentur] quo factum ut crediderim in commodum non cessurum si publico  
traderentur scripta de materiis Physicis, multosque sic periclitari 1674 **274–275** quæ passim inter  
eos viget] quam sibi ordinario accersunt 1674 **277** nam statim] statim enim 1674 **279** eius  
concupiendi] explicandi 1674 **282** eas] added 1682 **286** sint in eius scriptis versati] in eius  
scriptis non versati 1674 **288** illud] added 1682 **296** est] added 1682

illicò ignotus quispiam, famæ avidus, eum oppugnare antè, quam intelligat. Hinc dissertatiunculæ illæ sine Auctore plerunque in lucem editæ, in quibus meras contumelias & frigidas cavillationes ferè reperias; & in quibus veritates firmis rationibus innixæ, cùm everti nequeant, opposito veteri quodam Axiomate, aut Errore populari, qui semidoctorum aures permulcet, & nullis argumentis confirmatus admittitur, ludo vertuntur. Prætereà, quod observatu dignissimum est, hi Scriptores in aliorum libris id plerunque carpunt, quòd *Aristoteli* eos adversari arbitrantur: & tamen, cùm ipsi *Aristotelis* scripta, exceptis istis locis, quos inter legendum in tractatibus Physicis prolatos invenere, nunquam perlegerint; sæpissimè evenit ut quod refutare conantur, id ipsum *Aristoteles* tradiderit disertè.

Ab Antiquis certè æquiozem laboris sui mercedem ferebant Philosophi; Quod sine dubio partim in causa erat, cur Philosophia istis temporibus aliquos progressus effecerit. Tantum tum abfuit, ut temerè, & nullo merito suo, rerum novarum Inventorum læderetur fama, ut etiam publica illis decernerentur præmia, & statuæ ipsis nonnunquam ponerentur. Adeò persuasum erat istis temporibus, Honorem Artes maximè alere.

Nostrâ quidem ætate referri & restitui videtur hoc axioma; verùm etiamsi qui rerum potiuntur, Artes & Scientias auctoritate suâ probant & favore dignantur, tamen Physicæ studiosi diuturno torpore oppressi, adeò in Antiquitatis pronuntiatis acquiescere consueverunt, ut siquis novi aliquid proposuerit, & ipse & res proposita odio sit futura. Iam vero ut huius aversationis causa, seu potiùs prætextus, penitè tollatur, ostendendum est | eos plerunque allucinari, qui de novitate nobis obiiciunt; si enim res vera est, non potest esse nova, cùm veritas sit rerum omnium Antiquissima; nec aliud quicquam dici potest novum, nisi oppositi erroris detectio. Multi hominum, quòd has duas res parum discernant, ineptè exclamant nos naturam evertere, cùm er-

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269 *Aristoteli* eos] eos *Aristoteli* 1697 279–280 qui rerum potiuntur] Potestates 1697 283  
Iam vero ut] Ut autem 1697

diuturnus stupor, qui à tot retro sæculis eos occupavit qui Physicum studium amplexi  
sunt, adeo firmam impressit assuetudinem adhærendi traditionibus prædecessorum,  
300 ut vel sola mentio rei novæ, tædium & rei & hominis invehat: Quo vero corruat id  
fundamentum, aut potius aversi animi prætextus, necessum est ut illis demonstretur,  
eos passim decipi, qui introductæ novitatis reatum imputant. Si enim res quæpiam  
vera sit, novitas male illi impingitur; quandoquidem Veritate nihil antiquius sit, so-  
laque erroris detectio, illi opposita, novitatis nomine sit | donanda: Harumce duarum  
305 rerum discrimine non comperto, contingit ut quidam ridicule exclament naturæ vim  
inferri, cùm tantum falsæ opinioni, quæ animos illorum imbuit, bellum indicatur:  
Sed quanquam ratione infirma illi innitantur, authoritas, qua erga cæteros pollent,  
id semper obtinet, ut ab eorum exclamationibus plurimorum percellantur animi:  
Hinc mœstitiæ occasio in iis, quorum scopus alius non est, quam Symbolum conferre  
310 ad utilitatem publicam.

Quæ non quæso mœroris occasio, Harvæo fuit, dum tam inique à quibusdam san-  
guinis Circulatio, quam primus adinvenerat, excepta est; cum tamen eius motus alius  
omnino est ab eo, quem tradidit Antiquitas: Proculdubio gratiæ debebantur viro  
inveteratum errorem destruenti, ac per stabilitam ab ipso veritatem luce meridiana  
315 clarius ostendenti partem maximam antiquæ Medicinæ theoreticæ falsam esse: Interim  
remunerationis vices tenet ingens inimicorum caterva, doctrinam illius lacescentium:  
Concedo vero iterum, me, postquam innotuit, quam facile optima quæque convellan-  
tur, cum res per malam fortem hactenus occultæ, tanquam novæ ideo traducuntur, in  
mentem nunquam venisse publicis iuris facere, | quæ aliquando mihi comparassem,  
320 sive proprio Marte sive ex lectione operum quorundam neotericorum. Id saltem  
credidi forte non impossibile futurum, ut paulo ulterior solito progressus in rerum  
naturalium scientia mihi obtingeret, si sedulo declinarem omnia vitia à me superius  
enarrata, circa methodum ordinariam studio illi se addicendi. Revera consumptis à

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**298** eos] *added 1682* **298** qui] *quotquot 1674* **301-302** necessum ... imputant] illis demon-  
strandum est plurimos decipi novitatis introductæ reatum imputantes *1674* **303** quandoquidem]  
*added 1682* **303** Veritate nihil antiquius sit] Veritate quippe nihil antiquius est *1674* **304** sit  
donanda] donanda est *1674* **304-305** Harumce ... exclament] Error in rita harum duarum re-  
rum distinctione contingens, quosdam ridiculè exclamare cogit *1674* **311-312** Harvæo ... eius]  
Harvæo, à tam inique excepta, (quàm primus comperit) circulatione sanguinis, cuius *1674* **316**  
tenet] tenent *1674* **316** illius] *added 1682* **317-318** convellantur] convelli nata sint *1674*

rantem tantum modò, quam illi animo antè ceperant, opinionem convellamus. Verùm eius generis homines, quamvis ratio ab illis minimè stet, tamen exclamationibus suis, quâ gratiâ & auctoritate pollent, plurium animos semper movent; Quod non potest non apud eos magnam offensionem habere, qui id unum agunt, ut bonum publicum promoveant quam maximè. 290R

Quantam *Harvæo*, exempli gratiâ, sollicitudinem confecit, quòd inventio *Circulationis sanguinis*, qui longè alio modo movetur atque Antiqui crediderant, adeò frigidè, dum ipse vixit, exciperetur? Certè istius hominis beneficia non possumus satis gratâ memoriâ prosequi, qui obfirmatum mundo errorem eripuit, & exposita veritate, totam ferè Veteris Medicinæ Theoreticen falso fundamento niti luce meridianâ clariùs ostendit. Attamen cùm maximæ illi deberentur gratiæ, quot contrà inimicitias subiit? Iterum igitur atque iterum profiteor, cùm viderem quàm nullo negotio optima quæque impugnarentur, & quia ab omni memoriâ infeliciter ignorata fuissent, pro novis ideò haberentur; me nihil de vulgandis illis, quæ vel proprio Marte, vel recentiorum scriptorum perlectione essem aliquando percepturus, animo destinasse. Verùm id saltem fieri posse credidi, ut in rerum naturæ cognitione paulò longiùs, quàm fieri soleret, progrederer; si ab istis vitiis diligenter caverem, quæ in eorum, qui Physicæ ante studuissent, ratione deprehenderam: Et quidem, cùm aliquot annos in veterum & recentiorum scriptis pervol- | vendis collocassem; certus interim neque hos neque illos sequendi, nisi quatenùs ipsos rationem sequi viderem; mihi visus sum de spe non prorsùs decidisse. Dum autem libros pertractando, & sermonem cum viris literatis & studio optimarum Artium excultis habendo, me ità erudire conabar; intereà rationem meam, multa mecum meditando, & id semper enitendo ut ratiocinationes meæ in veritatibus Mathematicis certisque experimentis niterentur, assiduè excolebam. Et benè profectò iam procedebat res, cùm multi ex familiaribus 305R 300R 310R

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295 istius] illius 1697 299 Iterum igitur atque iterum] Rursùm igitur 1697 300 quia] quòd 1697 302 perlectione] evolutione 1697 303 destinasse] destinare 1697 304 fieri soleret] procedi solet 1697

me aliquot annis in lectione authorum antiquorum & neotericorum, sed ea cautione  
325 ut ne unquam illis adhærerem, nisi in quantum rationem his vel illis adstipulari de-  
prehenderem, visum fuit vota mea non omnino inania fuisse. Interim dum animum  
doctrina imbuere allaborabam per iugem lectionem librorum & cum doctis, virisque  
arte præstantibus conversationem, non destiti Rationem meam assiduo exercitio ex-  
acuere, varia apud me meditata circa plurima subiecta, eo semper collineans, ut ra-  
330 tiocinationes meæ veritatibus Mathematicis superstruerentur, experientisque certis  
firmarentur: Ac fælici successu institutum meum hucusque perductum est, ut am-  
icorum plurimi, quorum ingenii sagacitas omnibus perspecta erat, Authores essent,  
ut cæteros participes facerem, vel in locis ubi Disceptationes habentur, aut saltem  
inter col- | loquia familiaria. Id constanter dico, vix me assensum præbuisse, proprii  
335 diffisum viribus, & gnarum oratoriam artem satis apud me non esse præstantem,  
ut Veritatis patrocinium coram plurimis suspicere auderem: Interim manus dedi, &  
quanquam tenuitatis meæ probe conscius essem, amicis meis aures præbui, qui ratum  
fecerunt, si res nude & simpliciter ordinéque mathematico traderentur, si non om-  
nium, saltem ingeniorum tersissimorum gratiam essent inituræ: Revera consilio non  
340 defuit eventus; Nec enim solum gratæ & acceptæ fuerunt illæ disceptationes coram  
paucis habitæ: votum plurimorum fuit, ut earum materiam scriptis evulgarem; hinc  
tandem factum ut à præstita amicis obedientia, sensim elucubrationes meæ in libri  
molem abierint: Quia vero apographorum numerus in tantum auctus erat, ut pene  
publicus factus fuerit, multique irrepserunt errores, ideo animum cogitatio subiit,  
345 illum perlustrare, quo perfectionem pro virili illi inducerem. Qui eum lecturi sunt,  
facile percipient à me nihil prætermisum eorum esse, quæ Antiqui recte tradidere.

Ab Aristotele notiones omnes generales desumpsi, sive ad constitutionem princip-  
iorum rerum naturalium, sive quoad | ea quæ earum proprietates naturales spectant.

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**327–328** virisque . . . destiti] ambulationem, virisque arte præstantibus 1674 **328–329** exacuerem] quoque exacui 1674 **331** firmarentur] added 1682 **333** vel] ita 1674 **338** si non] nisi 1674 **339** gratiam essent inituræ] gratiam inituras 1674 **341** paucis] paucos 1674 **345** illi] added 1682 **345** eum] added 1682 **346** esse] added 1682

meis, quorum iudicium magni apud omnes esse videbam, Auctores mihi esse, ut quæ meditabar, cum aliis, vel colloquiis publicis, vel sermonibus saltem familiaribus communicarem. Ægerrimè sanè id à meipso impetrabam; cùm mihi valdè diffiderem, 315R  
nec me satis eloquentem putarem, qui Veritatis partes coram pluribus ità tutater. Nihilò tamen minùs amicis tandem concedebam, & tenuitatis meæ minimè ignarus, affirmantibus tamen, res simpliciter & more Mathematico propositas saltem apud æquiora ingenia gratiam habituras, credebam. Et benè sanè vertit hoc consilium; 320R  
Qui enim istis collocutionibus interfuerunt, non probabant modò quæ proferrem, sed efflagitabant etiam, ut eadem scripto relinquerem: Cùmque illud quoque, eisdem auctoribus, fecissem; tandem me librum sensim confecisse intellexi. Quoniam autem ità multa exscripta erant exemplaria, ut iam quasi vulgatus esset liber; multisque in locis scriptus erat mendosissimè; decrevi tandem eum summâ cum curâ recognoscere, ut quàm emendatissimus ederetur. Lector facilè observabit, nihil eorum, quæ ab Antiquis rectè sunt tradita, ibi prætermissum. 325R

Generales omnes Notiones, tum quæ ad principia rerum naturalium definienda, tum quæ ad præcipuas earum proprietates pertinerent, ex Aristotele desumpsi; & reiectis *Inani* ac *Atomis*, seu *In- | secabilibus* Epicuri, (quæ illis, quæ ab Aristotele firmissimis rationibus probata iudicabam, contraria erant;) varias particularum sub sensum non cadentium, ex quibus quæ sub sensum cadunt composita sunt omnia, magnitudines, figuras ac Motus, summâ cum curâ contemplari ab Aristotele didici. Quod quidem eò lubentiùs feci, quòd hæc omnia cum *aptâ ad dividendum* materiæ *naturâ* necessariò essent coniuncta; quam proprietatem ego materiæ attribui, Aristotelem secutus, qui haud ferè ullam singularem Quæstionem expedit, in quâ partium magnitudinem, figuram ac Motum, & interiectos meatus non expendat. Verùm ad 330R  
335R

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**322** sensim] sine sensu 1697    **326** sunt tradita] tradebantur 1697    **331** ex quibus quæ] ex quibus ea quæ 1697    **332** Aristotele] illo 1697    **335** in quâ partium] in quâ corporum partium 1697

350 Atque eierato Vacuo, Atomis aut Insecabilibus Epicuri, quæ meo iudicio, repugna-  
bant iis, quæ ab Aristotele rite stabilita sunt, eo duce, quam maximo studio licuit,  
examen institui differentium magnitudinum; figurarum & motuum partium insen-  
silium, è quibus Entia sensibilia constant. Id eo libentius suscepi, quod ea omnia  
arcto nexu cum divisibilitate materiæ, necessariaque relatione iungantur, quam Aris-  
totelem sequutus admitto, qui paucas quæstiones particulares solvit; quin considerari  
355 iubeat magnitudinem, figuram & motum partium corporis, cum poris iis inexisten-  
tibus. Hoc vero maxime me induxit ad amplexum huius considerationis, quod cùm,  
me iudice, in dubium revocare non liceret existentiam quarundam qualitatum & fac-  
ultatum, vulgo assignatarum quibusdam entibus, eo adduci non potuerim, ut eadem  
ratione dubitare liceret iis inesse partes insensiles, nec decipi me posse afferentem  
360 partibus iis omnibus inesse suam magnitudinem, & figuram peculiarem.

Præter primam illam lucem ab antiquitate desumptam, plurimas alias veritates ab  
illustrissimis Philosophis neotericis excerpti, quorum nomina suis locis traden- | tur:  
In eorum vero numero, qui maxime constructionem operis promoverunt, recensendus  
venit celeberrimus Dominus Des-Cartes, cuius tamen nomen semper subticui, ne iden-  
365 tidem iterandum esset: cuius merita cum quotidie magis ac magis omnibus Europæ  
nationibus innotescant, atque iam in pretio sint apud præcipuas, hanc veritatis con-  
fessionem extorquebunt, Galliam æque felicem esse in productione & educatione  
insignium & illustrium virorum, in omni artium & scientiarum genere, ac antiquam  
Græciam.

370 Totum opus in quatuor partes à me distributum est; In primâ generice ago de cor-  
pore naturali, præcipuisque proprietatibus, exempli gratia, Divisibilitate, de Motu &

hanc contemplationem id me in primis impulit, quòd cùm veritatem *Qualitatum* quarundam & *Virium*, quæ diversis corporibus tribui solent, rectè in dubium vocari posse viderem; non existimabam *partes sub sensum non cadentes* pari ratione in dubium venire posse; aut me errare posse cùm dicerem, unamquamque earum partium propriam suam habere magnitudinem & figuram. 340R

Ad hæc prima adiumenta, quæ Antiquis accepta refero, alias permultas veritates ex celeberrimorum recentium Philosophorum, quorum nomina suis locis proferentur, scriptis expersi. Clarissimo autem *Cartesio*, cuius nomen, nè sæpiùs esset repetendum, semper silui, in hoc opere componendo usus sum uno omnium plurimùm; cuius virtutes ut iam apud multas gentes notæ sunt, ità per totam Europam multò in dies futuræ notiores, mundum universum fateri cogent, *Galliam* omninò æquè, ac antiquam *Græciam*, in hominibus omnium artium studio eruditis procreandis & enutriendis felicem fuisse. 345R

Totum opus in quatuor partes distribui. In primâ, ago de Corpore naturali in universum, & præcipuis illius proprietatibus, ut *Naturâ ad dividendum aptâ, Motu & Quietè, Elementis & Qualitatibus sub sensum cadentibus*; illis maximè, quæ ad *Visionem* pertinent; de quâ materiâ mihi persuasum habeo, me septem aut octo capitibus plures veritates pressisse, quàm spissa volumina, in quibus *Optice, Dioptrice, & Catoptrice Veterum* more tractantur, continere solent. 350R 355R

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**337** id] illud 1697 **338–339** vocari posse viderem] vocare posse viderer 1697 **341** propriam suam] suam propriam 1697 **344** expersi] excerpsti 1697, 1702, 1710 **353** mihi persuasum habeo] gloriari licet 1697

Quiete, de Elementis & Qualitatibus sensibilibus; speciatim incubui in explicationem  
qualitatum Visus. Circa eam materiam gloriari liceat me plura, eaque verissima, octo  
aut novem capitibus conclusisse & conguessisse, quam contineant plurima & crassis-  
375 sima volumina, quæ Opticen tradunt, Dioptrices & Catoptricen, iuxta antiquorum  
mentem.

In secundâ ago de Mundi Systemate, aut Cosmographia; Hoc, me iudice, utilius  
quæstionibus generalibus agitari solitis in Physicis ordinariis, vices commentariorum  
tenentibus in libros, quibus Aristoteles titulum fecit *de Mundo*: De Astrorum quoque  
380 natura eorumque influentiis verba facio: Atque tradita Gravitatis & Levitatis natura,  
de quibus, præmissorum inopia, in prima parte agere non potui, opus claudio per  
explicationem Æstus maris.

Tertia pars, destinata est notitiæ naturæ Terræ, & corporum terrestrium, hoc  
est, corporum in illa contentorum, vel illam ambientium, hoc est Aeris, Aquæ, Ignis,  
385 Salium, Oleorum, Mineralium & Meteororum.

Tandem in quarta parte conatus sum colligere quicquid iam certum de corpore  
Animato compertum est.

In constitutione huius methodi, tanquam rem extraordinariam quidam adno-  
tabunt, me fuse & per partes, à prima huius libri exhibuisse parte, omnes qualitates  
390 sensibiles, quas Philosophi ut plurimum paucis percurrunt, traduntque, demum sub  
finem tractatus Physici, in commentariis ad Aristotelis libros *de Anima*: Id vero  
eapropter à me factum est, quod | nostri notitia inde elucescit, tum quia hoc pacto  
protinus facessere iubeo errorem popularem, & excutio præoccupationem ab infantia  
insitam, qua multos per experientiam imbutos novi; nec liberari potuisse scio per  
395 lectiones institutas in fine cursum ab iis institutorum, ita ut in scholis non exuant  
habitum iam pridem contractum, scilicet, tribuendi sensationes obiectis eas in iis  
parientibus, ac considerandi easdem sensationes, quasi qualitates iis obiectis insitas.

Cæterum, vix toto hoc in Tractatu quispiam me multum ab Aristotele abire

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392 est] added 1682

In secundâ, ago de *mundi Compositione*, seu *Descriptione*; Quod ego ad maiorem utilitatem adduci posse existimavi, quàm generales Quæstiones in Physicis illis proponi solitas, quæ tanquam Commentarii in Aristotelis Librum, qui inscriptus est, *De Mundo*, vulgò componuntur. Ago etiam in hâc parte de *siderum* naturâ, & eorum *vi in terrena transfusâ*; & expositâ *Gravitatis ac Levitatis* naturâ, de quibus in primâ 360R parte agere non potui, proptereâ quòd ea nondum tradideram quæ necessariò erant præmittenda; claudit hanc partem, *Accessûs & Recessûs Maris* explicatio.

In tertiâ parte, ago de naturâ *Terræ* corporumque *terrestrium*, hoc est, eorum quæ Terra complectitur, vel quibus illa circumfusa est; ut *Aeris, Aquæ, Ignis, Salium, Oleorum, Metallorum, Fossilium, & Sublimium*. 365R

Postremò, in quartâ parte, quicquid de *corpore Animato* certi & explorati habemus, premere conatus sum.

In hoc ordine illud fortassè mirum nonnullis videbitur, quòd ego in primâ huius Libri parte fusè & singulatim de Qualitatibus sub sensum cadentibus disputârim: cum Philosophi in Commentariis suis in libros Aristotelis, qui inscripti sunt, *De Animâ*, eas in extremo tractatu Physico, idque satis breviter, soleant explicare. Hoc autem ideò feci, tum quòd ad sui cognitionem pertineat; tum quòd hoc modo auspicatò eripiatur popularis error, & antecepta animo iam à teneris unguiculis | opinio, quam nonnullos etiam post novissimas de eâ re habitas Prælectiones retinuisse novi, & è Scholis domum retulisse; nempè Sensus suos rebus externis, quæ illos excitârunt, 370R 375R tribuendos esse, in eisque inhærentes esse Qualitates.

Quod superest, non multa in toto hoc Tractatu ab *Aristotele* dissidentia reperias; à plerisque autem illius Interpretibus plura quàm vellem. Prætereâ multa hîc observes, quæ *Aristoteles* & Sectatores eius silentio præterire solent; quæ tamen ego illis rebus, in quibus Philosophi sæpè maxime laborant, utiliora esse iudicavi. 380R

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**363** tertiâ] terrâ 1718, mistakenly **368** quòd ego] me 1697 **369-370** disputârim: cum] disputâsse, quas 1697 **371** eas] added since 1702 **371** soleant] solent 1697 **371** Hoc] Illud 1697 **372** quòd ad sui] quòd id ad sui 1697 **372** hoc] eo 1697 **376** in] added since 1710 **378** à plerisque autem illius Interpretibus] a maximâ autem illius Interpretum parte 1697 **380** rebus] added since 1702

deprehendet: Deprehendet autem Opiniones quam plurimas, contrarias & dissidentes  
400 à sententia plerorumquè eius commentatorum: Præter has, plures occurent circa  
maximum rerum numerum, quas & *Aristoteles* & eius discipuli ut plurimum missas  
faciunt; meo tamen iudicio, magis utiles multis aliis, circa quas toti sunt Philosophi.  
His in rebus vitio mihi non vertendum credidi, si à vulgatis quibusdam sententiis  
secessum facerem, ubi à Veritate eas declinare animadverti.

405 Hoc vero multum contulit ad eximendos scrupulos mihi obstantes, nempe ab  
instituta comparatione inter loca, in quibus ab Aristotele dissentio, & eorum scripta,  
qui publicè Philosophiam profitentur, multo minorem eorum numerum in meo opere  
occurrere, quam in aliorum operibus: Atque ut ne supputatio eorum instituat, rem  
firmare facile est, si perpendatur nullam dari quæstionem circa quam in diversa  
410 non trahantur & dividantur, cum una pars semper conclusiones contrarias eliciat  
alteri parti: unde sequitur in eorum scriptis, qui doctrinam Aristotelicam profitentur,  
necessario reperienda esse tot loca Aristoteli faventia, quot eum impugnantia.

Sed tandem licet omnes Philosophi uno spiritu afflarentur, & ab Aristotele non  
discederent, consonantia illa satis valida non est, ut abiurare meas cogitationes  
415 propterea debeam, aut cæterorum Philosophorum mancipium fieri, ubi de eorum  
erroribus certo mihi constat: Nam cum iis in more positum sit, ut omnem subiectam  
materiam problematicè agitent; methodus illa anceps indicium præbet libertatem  
cuique concedi à partibus stare eorum, quos rationem du- | cem sequi noscimus:  
Docebit tempus quo vultu excipienda sint quæ sincere promo: Interim versionem  
420 Latinam meditor in exterorum gratiam, quorum benevolentiam, & gratiam præ-  
toler.

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**399** Deprehendet autem Opiniones] Opiniones autem 1674    **416** Nam cum] Cum enim 1674  
**418** concedi] superesse 1674

In quibus omnibus rebus mihi religio non erat, quominus à peculiaribus quibusdam opinionibus recederem, cùm illas à veritate recessisse comperissem.

Scrupulos autem, qui mihi etiam restare possent, ex animo hoc maxime evulsit, quod cùm illas huius Operis partes, quæ *Aristoteli* adversarentur, cum eorum scriptis, qui Philosophiam publice profiterentur, conferrem; multò pauciora in meo libro reppererim ab *Aristotele* dissidentia, quàm in aliorum. Nihil calculo opus: Res ipsa sane indicat; cùm utique haud fere ulla quæstio sit, super quâ sententiæ non sint ità divisæ, ut in duas partes discedentes Philosophi contrarias tueantur opiniones; Ex quo sequitur, in eorum scriptis, qui *Aristotelis* doctrinam exponere instituunt, totidem contra illum facere oportere loca, quot ab illo faciant. 385R 390R

Ceterùm licet *Aristoteles* & omnes tandem Philosophi concurrant: tamen cur mihi necessitatem afferant cum illis sentiendi; & quâ lege ego illos etiam tum sequi teneam, cum persuasissimum habeam eos de viâ declinâsse; equidem non video. Cùm enim omnia, de quibus disputare in animo habent, in problemata redigere solenne sit; ostendit ea dubia ratio, cuique adhuc integrum esse, ut quam ratio- | ne nixam iudicaverit sententiam, in istam eat. Qualibus usurum sit Lectoribus hoc animi sinceri opus, tempus indicabit; Latinam interim, exterorum gratiâ, quos eam benignè excepturos pollicetur mihi animus, versionem adorno. 395R

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383 hoc] illud 1697 387 utique] added since 1710 391 tamen] added since 1710 395–396 ut ... eat] ut in eam quam ratione nixam iudicaverit, sententiam eat 1697