AN APPENDIX IN ANSWER TO THE 'REASONS FOR NOT REPLYING TO MR. WALTON'S FULL ANSWER'

By

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NOTE ON THE TEXT

This Appendix was originally included the second edition of Jacob Walton's *Catechism of the Author of the Minute Philosopher fully answered*, and responds to criticisms of the *Catechism* in Berkeley's *Reasons for not replying to Mr. Walton's full answer*.

This text has been prepared from the copy of the original 1735 pamphlet in the library of Trinity College, Dublin.

David R. Wilkins

Dublin, June 2002

AN

APPENDIX

In Answer to the *Reasons for not replying to Mr.* WALTON'S Full Answer

By a Paper, intitled, *Reasons for not replying to Mr.* WALTON'S *full Answer*, I find that the Author of the *Minute Philosopher*, still persists in his Mistakes concerning Sir *Isaac Newton*'s Doctrine of Fluxions. He declares *he can honestly say, that the more I explain, the more he is puzzled:* And I can as honestly say, that I believe him. For a Person who does not understand what Sir *Isaac* means by *Velocity*, must necessarily be ignorant of his Doctrine of Fluxions, deduced from the Nature of *Velocity*; and be puzzled with all true Explications of that Doctrine. What Sir *Isaac Newton* means by the Word *Velocity*, I shall explain in the following Propositions.

I. The Velocity of a Body, is the Ratio of the Quantity of Motion to the Quantity of Matter in the Body; and is as the Ratio of the Quantity of the Action of the moving Force to the Weight of the Body; or as the Ratio of the Quantity of that Action to the Density and Magnitude of the Body taken together. That is, putting V for the Velocity of a Body, M for the Quantity of its Motion, F for the Quantity of the Action of the Force which generates that Motion, D for the Density of the Body, B for its Bulk or Magnitude and W for its Weight, V is $\frac{M}{Q}$, and is as $\frac{F}{W}$, or as $\frac{F}{DB}$.

For as the Quantity of Motion is the Quantity of Matter and Velocity taken together; that is M is QV: And consequently V is $\frac{M}{Q}$: But the Motion of a Body is as the Quantity of the Action of the Force with generates it, Effects being always proportional to their adequate Causes, that is, M is as F; and at a given Distance from the Centre of the Earth, the Quantity of Matter in a Body, is as its Weight, or as its Density and Magnitude taken together; that is, Q is as W, or as DB: And therefore V is as $\frac{F}{W}$ or as $\frac{F}{DB}$.

The Forces which generate Motion in Bodies may be of different Kinds, as a Blow, Pressure, Weight; all which may be conceived: And Density and Bulk may likewise be conceiv'd: Consequently the two measures of Velocity, $\frac{F}{W}$ and $\frac{F}{DB}$, may both be conceived, and yet neither of them includes Time and Space. This author therefore has been grosly mistaken in asserting that *Velocity* necessarily *implies both Time and Space, and* cannot *be conceived without them.—And that there is NO Measure of Velocity except Time and Space, the Proportion of Velocities being ONLY compounded of the direct Proportion of the Spaces and the reciprocal Proportion of the Times.*

II. The Velocity of a Body, exists in the Body it self while it continues in Motion.

For the Velocity of a Body, is an Effect of some Cause acting upon it: But this effect can exist no where except in the Body acted upon; for could it exist any where else, an Effect might exist where there is no Cause to produce it, or in other words, an Effect might exist without a Cause, which is absurd: And therefore the Velocity of a Body exists in the Body it self while it continues in Motion.

Hence it appears that a Body in Motion, will have a Velocity inherent in it self during the whole Time of its Motion: And consequently there must be a Velocity where-ever the Body is, exclusive of Time and Space. If instead of a Body the Thing moved be a Point, its Velocity will exist in a Point, and successively will exist in every Point of Space through which the Point moves.

Here I may properly take notice of this Author's Objection against my Proof that Velocity can exist in a Point; my Argument for it was conceived in these Words. "If a Cause acts continually upon a given Body or Thing, in order to move it without any Interruption, there must ensue a continual Increase of its Velocity; and consequently no two Points of the Space described, however near to each other, can be assign'd, in which the Velocity is the same: For that wou'd manifestly suppose a Cessation of the Action of the moving Cause during the Passage of the Body or Thing thro' the Interval comprehended between the two Points." Now he thinks that from the continual Action of a moving Force, and from the generated Velocity not being the same in any two different Points of the described Space, it will not follow that Velocity can exist in a Point of Space. But in this he is mistaken. For the continual Action of the moving Force necessarily preserves a *continual* Velocity; and if the generated Velocity be not the same in any two different Points of the described Space, a Velocity must of Consequence exist in every Point of that Space.

III. The Velocity of a Body is the Rate or Degree of its Tendency forward.

For the Velocity of a Body, is a Part of its Motion by the first Proposition, and exists in the Body, by the second: But there is nothing existing in a Body moved or translated from one Place to another besides its Quantity of Matter, and the Rate or Degree of its Tendency forward: And therefore the Velocity of a Body is the Rate or Degree of its Tendency forward.

IV. The Account of Velocity given in the two preceding Propositions, is agreeable to Sir *Isaac Newton*'s Notion of Velocity; who constantly excludes described Space from his Idea of that Term.

For, as I remember, whenever he uses the Word *Velocity* in his Principles of Philosophy, he speaks of the Velocity of a Body existing in some one certain Place; by which it appears, that he confines Velocity to the Place of the Body: But there is no Space described by a moving Body existing in one and the same Place: And therefore he excludes all Space described from his *Idea* of *Velocity.* And he expresly does it in his Doctrine of Fluxions. For he calls Velocities *Fluxions*; and by Fluxions declares, that he does not understand any Increments generated, and consequently not any Spaces described: Whence it necessarily follows, that Velocities, in his Doctrine of Fluxions, do not imply any Spaces described. Therefore the Proposition is true.

The Velocity of a Body, is an Effect communicated to the Body by the Action of some moving Force or Cause, and is retain'd in it by the Inertness of Matter, till destroy'd by the Action of some contrary Force or Resistance; and by being retain'd in it, becomes a Cause of the Body's going forward, or of its being translated continually into a new Place: So that the continual Translation of a Body into a new Place, is really an *Effect* of Velocity, which Velocity may be conceived to exist in the Body prior to the Progress of the Body, as all Causes may be conceived to exist prior to the Effects produc'd by them.

V. If the Velocity of a Body or Thing moved be given, or increase with the Time of the Motion, it will be measur'd by the Space described apply'd to the Time of its Description: And if it increases any how either regularly or irregularly, it will be measur'd by the first Ratio of the Space to be described in a given Particle of Time. If S denotes the Space described in the time T, and $\dot{\mathrm{S}}$ the first Ratio of the Space to be described in a given Particle of Time, then V will be as $\frac{\mathrm{S}}{\mathrm{T}}$ when the Velocity is either given, or increases with the Time of the Motion; and as $\dot{\mathrm{S}}$ when it increases any how regularly or irregularly.

Case 1. If the Velocity be given, that is, if the Body constantly goes on at the same Rate, the Space described, reckoning from the Beginning of the Motion, will be as the Time of its Description; and consequently the Ratio of the Space described to the Time of its Description; that is, $\frac{\mathrm{S}}{\mathrm{T}}$ will be a given Quantity: But one given Quantity may be the Measure of another: And therefore V will be measur'd by $\frac{\mathrm{S}}{\mathrm{T}}$.

Case 2. If the Velocity increases with the Time of the Motion, the Space describ'd must increase with the Square of the Time; whence $\frac{\mathrm{S}}{\mathrm{T}}$ will be as T, that is, as V: And consequently in this Case also V will be measur'd by $\frac{\mathrm{S}}{\mathrm{T}}$.

Case 3. If the Velocity increases any how either regularly or irregularly, the Space to be described in a given Particle of Time, will begin to exist, no Part of it being yet described, with the Ratio of the Velocity: But the Ratio with which that Space begins to exist or to be described, is its first *Ratio*: And therefore the Velocity will be measured by the first Ratio of the Space to be described in a given Particle of Time. Consequently V in all Cases will be measur'd by $\dot{\mathrm{S}}$.

The two first Cases of this Proposition are particular ones, and obtain *only* when the Force which generates the Motion acts either by one single Impulse, or continually with the same Degree of Strength during the whole Time of Motion: The last is a general one, and obtains in all Cases whatever: This general Measure of Velocity Sir *Isaac Newton* uses in his Doctrine of Fluxions: It continually exists in the final Limits or Extremities of Quantities actually generated by Motion, and just beginning to be increas'd by a Continuance of that Motion, tho' as yet no Parts of their isochronal Increments are described; for those Increments *must* begin to exist in the Ratio of the Velocities, which the generating Quantities have in the final Limits of the Quantities generated, which are the initial Limits of their Increments.

If the Ratio of the Velocities existing in any two points be $\frac{4}{3}$ or $\frac{3}{2}$, the first Ratio of isochronal Increments commencing from those Points, will be $\frac{4}{3}$ or $\frac{3}{2}$.

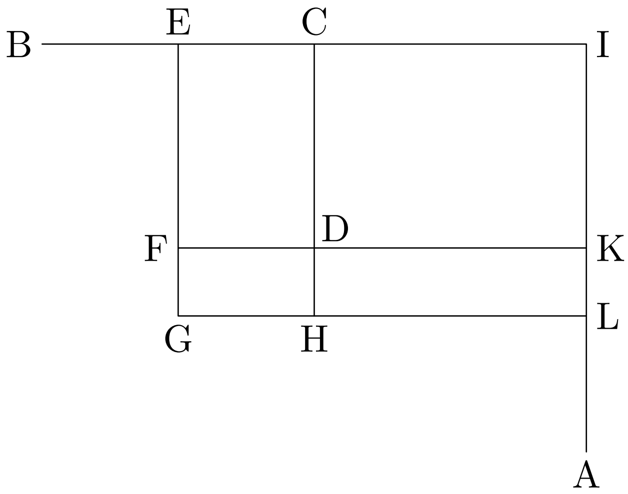
Having shewn what Sir *Isaac Newton* means by the Word *Velocity*, and given an Account of its *Measures*; I will now, by way of Inference, shew the Weakness of this Author's Objections against the several Parts of the foregoing Answer; and in doing of this I shall be less methodical, because I intend to pursue *him* in the order of his *Reasons*.

First then, in *Sect.* 3. he takes notice of my Freedom in calling his *Analyst* a Libel: I am sorry my *free Manner* should offend him: but I must continue to call it a Libel, till he produces Proofs to the contrary. He tells me, *I well know a bad Vindication is the bitterest Libel.* I cannot say I know it; but I know that defaming one of the greatest and best Men, who had nothing at heart besides the Promotion of true Philosophy and true Religion; is a most *bitter* Libel: A bad Vindication may proceed from a good Mind and an honest Intention; but Defamation and Detraction can arise from neither.

In *Sect.* 4, 5. he finds fault with my Proof that Velocity can exist in a Point of Space. But I have shewn the Justness of that Proof under the second Proposition, to which I refer him. That Proof may perhaps appear more evident to some, by considering the Motion of a Body in falling from a State of Rest by the Force of its own Weight. For setting aside the Resistance of the Air, and supposing the Weight of the Body to be the same at all near Distances from the Surface of the Earth; its Velocity, from the continued Action of that Weight, will increase continually as the Time of falling increases, or as the square Root of the Length described increases, reckoning that Length from the Beginning of the Motion; and therefore Velocity will exist and be different in every different Point of the described Space: Both these are necessary and inevitable Consequences of the continued Action of the Weight of the Body during the Time of its falling; and of the Velocity's being proportional to the square Root of the Space described.

In *Sect.* 6, 7. he charges me with giving an Account of Motion different from Sir *Isaac Newton*, "*who distinguishes two Sorts of Motion, absolute and relative. The former he defineth to be a Translation from absolute Place to absolute Place, the latter from one relative Place to another. Mine, which exists in a Point, which may be conceiv'd without Space described,* he says, *is plainly neither of these Sorts of Motion, but some third Kind, which he is at a loss to comprehend. But he can clearly comprehend that, if we admit Motion without Space, then Sir* Isaac Newton*'s Account of it must be wrong: For Place by which he defines Motion is, according to him, a Part of Space.*" Now in Answer to this I say that all Motion, which can neither be generated nor changed but by Forces impress'd on a Body, necessarily exists in the Body it self while it continues to change its Place, and is the Quantity of Matter moved and its Velocity or Degree of Tendency forward taken together: The continual Translation of a Body therefore into a new Place is, as I have before observed, an *Effect* of this Tendency forward in the Body, and not the Tendency itself; consequently Space describ'd is an *Effect* of Velocity, and not the Velocity itself. Velocity, according to Sir *Isaac Newton*, does not necessarily imply any Space described: And therefore, consider'd as an Effect existing in the Body, can be nothing but the Rate or Degree of its Tendency forward, as I have proved it to be in Prop. III. Consequently I have not given a different Account of Motion from Sir *Isaac Newton*, but an Account every way consistent with his Principles.

In *Sect.* 8. I find the following Passage transcribed from the *Analyst.* "*Velocity* necessarily *implies both Time and Space, and* cannot *be conceiv'd without them. And if the Velocities of nascent and evanescent Quantities, that is, abstracted from Time and Space, may not be comprehended, how can we comprehend and demonstrate their Proportions? or consider their* rationes primæ & ultimæ. *For to consider the Proportion or Ratio of Things, implieth that such Things have Magnitude: That such their Magnitudes may be measur'd, and their Relations to each other known. But, as there is NO Measure of Velocity except Time and Space, the Proportion of Velocities being ONLY compounded of the direct Proportion of the Spaces and the reciprocal Proportion of the Times; doth it not follow, that to talk of investigating, obtaining and considering the Proportions of Velocities, exclusively of Time and Space, is to talk unintelligibly?*" This Passage I have fully answer'd, in having proved that there are other Measures of Velocity besides Time and Space. I have given two general Measures of it in the first Proposition, and one in the fifth; all of which may be clearly conceiv'd, and yet not one of them includes or implies either Space described or Time; and I know no general Measure of which it does. I agree with him that to consider the Proportion or Ratio of Things implieth that such Things have Magnitude, but "to consider the first or last Proportions of Quantities does not at all imply that such Quantities, have Magnitudes. These are not the Proportions of first or last Quantities, or of any generated Magnitudes whatever, but the Proportions of the Velocities with which Quantities begin or cease to have Magnitudes."

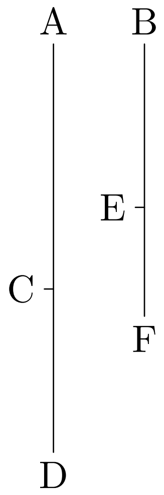


The next two Sections relate to the Moment of a Rectangle. If the Rectangle C D K be generated by the Motions of two right Lines, and from a Continuance of their Motions be increased by the Gnomon C G K; and if A and B are put for the Sides D K and D C, and $\frac{\mathrm{a}}{\mathrm{b}}$ for the first Ratio of their isochronal Increments $\frac{\mathrm{DF}}{\mathrm{DH}}$, which first Ratio is equal to the Ratio of the Velocities in D towards F and H; the Moment or Mutation of the Rectangle C D K, will be $\mathrm{A\,b} + \mathrm{B\,a}$, as I have fully proved in the foregoing Answer. In the Augmentation of a Rectangle no Motions exist but the Motions of its Sides, which Motions, according to Sir *Isaac Newton*, constitute its Moment or Mutation: And if the Sides of the Rectangle E G L, flow back till they coincide with those of the Rectangle C D K, and the generated Gnomon C G K vanishes; I have proved that the Motion subsisting in the Instant of its Evanescence, which is also the Moment of the Rectangle C D K, is the Sum of the Motions of the Sides of that Rectangle, or A b + B a; and he ought either to allow it or prove the contrary. To say that a and b must denote the Magnitudes of the Increments D F and D H, and not their first Ratio, or the Ratio of the Velocities in D towards F and H, is to assert a manifest Falshoold. For the Velocities during the Passage of the moving Quantities from D to F and H, may be so changed that the Magnitudes of the Increments D F and D H, shall have a Proportion very different from that of the Velocities in D towards F and H: And therefore D F and D H, how small soever, cannot measure the Fluxions of D K and D C; and consequently cannot be the Things expressed by a and b.

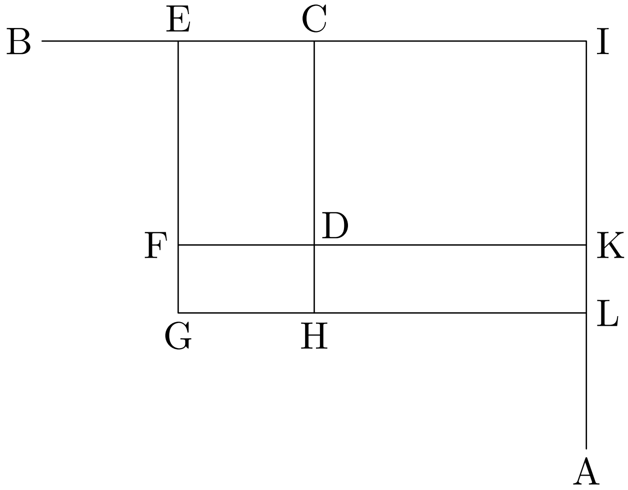
In the next place he charges me with *explaining Fluxions by the Ratio of Magnitudes infinitely diminish'd*, although I had expresly told him, that they are not measured or expounded by the Proportions of any generated Magnitudes whatever; but by the first and last Proportions of isochronal Increments generated or destroyed by Motion. The Passage which occasion'd this senseless Notion, is contain'd in the 9th Page of the *Vindication*, and stands in these Words, "To obtain the last Ratio of synchronal Increments, the Magnitudes of those Increments must be infinitely diminsh'd: For their last Ratio is the Ratio with which they vanish and become nothing." To which may be added a like Passage in the 14th Page of the same *Vindication*, in these Words. "The Magnitudes of synchronal Increments must be infinitely diminish'd and become evanescent in order to obtain their first or last Ratios, to which Ratios the Ratios of their corresponding Fluxions are equal." Now a fair and ingenious Reader, who had nothing at heart but the establishing of Truth and Science, would easily have collected from either of these Passages, that I did not explain or expound Fluxions by the Ratio of Magnitudes infinitely diminish'd, but by the first or last Ratios of Increments generated or destroyed in equal Times; that is, by the Ratios of the Velocities with which those Increments begin or cease to exist.

In the 20th Page of the foregoing Answer, I have asserted, that "the first or last Proportions of isochronal Increments, subsist when the Increments themselves have no Magnitudes; forasmuch as the Motions subsist with which those Increments, *just now, in this very Instant*, begin or cease to exist; to which Motions these Ratios are proportional." In Answer to this the Author of the *Reasons* asks his Reader, "*Whether the isochronal Increments themselves subsist when they have no Magnitude? Whether there can be an Increment where there is no Increase, or Increase where there is no Magnitude? Whether if Magnitudes be not generated by Motion in equal Times, what else is generated therein, or what else is it that Mr.* Walton *calls isochronal?*" To the two first of these Questions I reply in the negative, and to the last in the affirmative; and would fain know what he infers from thence. I did not say that isochronal Increments subsist when they have no Magnitudes, but that the first and last Ratios of such Increments subsist when the Increments themselves have no Magnitudes; and gave him the Reason why they subsist, which according to his usual Candour he has taken no notice of.

If the Lines A C and B E be generated by the Motions of two Points setting out from A and B, and be increas'd in equal Times from a Continuance of their Motions by the Increments C D and E F; these Increments will begin to exist with the Velocities which the moving Points have in their initial Limits at C and E; and the Ratio of those Velocities will be the Ratio with which the Increments begin to exist, that is, their first Ratio; consequently the first Ratio of C D and E F subsists when the Increments themselves do not subsist, that is, before



they have acquired any Magnitude whatever. The first Ratio of the Increments C D and EF, is not the Ratio of those Increments, nor of any Parts of them; it is not their Ratio considered as existing and having finite Magnitudes, but the Ratio which which they begin to exist and have Magnitudes. If the Velocities in C and E be as 3 and 2, the first Ratio of the isochronal Increments C D and E F, will be the Ratio of 3 to 2, and may be expounded by any two Lines which are as 3 to 2; but those Lines are not the Increments themselves nor any Parts of them. For the Velocities may perpetually vary in the Progress of the moving Points from C and E, to D and F; and their Variation may be such that C D and E F, however small, may be in a very different Proportion from that of 3 to 2, as I have observed above: So that the Fluxions of Lines cannot be measured or expounded by any Proportions of their isochronal Increments, except their first and last Proportions.



In order to assist the Understanding of his Correspondent he says, that in the Genesis of a Rectangle by Motion, I have suppos'd two Points to exist at the same Time in one Point, and to be moved different Ways without stirring from that Point. This he is pleas'd to call a *Riddle*, and says that *I have the Conscience to call it a full and clear Answer* to Part of his CATECHISM. I do not indeed profess much skill in making or explaining of *Riddles*, but

I can see it will not be very difficult to clear this Affair. Let any two Lines K F and C H, intersecting each other in D, be describ'd by the Motions of two Points, setting out from K and C; (*See the Figure* [above]) and let the Velocities of the moving Points be such, that they arrive at D exactly at the same Instant of Time: Upon their Arrival in D, it is plain the two Points will exist in the Point D; which he may venture to allow, since mathematical points have no Magnitude: So far the *Riddle* is clear. And since the two Points can exist in D, as they certainly may without any Absurdity, they must preserve their respective Velocities or Tendencies forward to F and H, and go on in the Directions DF and D H, by Virtue of those Velocities or Tendencies, there being nothing to change or destroy them: But they cannot go on in those Directions without stirring from the Point D: And therefore he has been mistaken in saying I supposed two Points to be moved different Ways in the same Point, without stirring from that Point. Farther, from the Genesis of the Rectangle C D K, it is obvious that the common Intersection of the moving Lines I B and I A, in which the two Points are supposed to exist at the same Time, will continually go forward with the Lines themselves; but it cannot continually go forward with the Lines themselves unless it continually goes into a new Place. Surely this Author's Friends must be ashamed of him for calling this a Riddle, which is plain to any one who has in the least considered these Things.

In *Sect.* 14. he honestly confesses *he does not understand Sir* Isaac*'s Doctrine so far as to frame a positive Idea of his Fluxions; and yet from certain negative Conceptions thereof* he takes upon him to say *that by the Genesis of a Cube I have not explain'd the Nature of second, third and fourth Fluxions in a Way agreeable to that Doctrine.* But in this he is mistaken. For (by *Lem.* 2, *L.* 2. *Princip. Newt.*) if A flows with an uniform Velocity expres'd by a, $3\,\mathrm{a}\,\mathrm{A}^2$ is the Moment of A^3, $6\,\mathrm{a}^2\,\mathrm{A}$ the Moment of $3\,\mathrm{a}\,\mathrm{A}^2$, $6\,\mathrm{a}^3$ the Moment of $6\,\mathrm{a}^2\,\mathrm{A}$, and 0 the Moment of $6\,\mathrm{a}^3$: But according to Sir *Isaac* the Moment of the Moment of A^3, is the second Moment of A^3; the Moment of that second Moment, is its third Moment; and the Moment of the third Moment, is its fourth Moment: And therefore $3\,\mathrm{a}\,\mathrm{A}^2$, $6\,\mathrm{a}^2\,\mathrm{A}$, $6\,\mathrm{a}^3$ and 0, are the first, second, third, and fourth Moments of A^3. Farther, I have shewn that all these Moments or Motions exist and may be clearly and distinctly conceiv'd, in the Instant that a Cube generated by an uniform Motion, begins to be increas'd by a Continuance of that Motion: And therefore in the System of Motion whereby a Cube begins to be augmented, I have given an Explanation of first, second and third Fluxions every way agreeable to Sir *Isaac*'s Doctrine: And he ought either to allow it or shew the contrary.

He tells his Reader (Sect. 17.) that in saying there can be no fourth Fluxion of a Cube, *I make it my Business directly to overthrow Sir* Isaac Newton*'s Doctrine. For if there can be no fourth Fluxion of a Cube, there can be no second Fluxion of a Line, and* a fortiori, *no third or fourth or fifth Fluxion.* Here it must be observed that one Circumstance which I particularly suppos'd, has not been attended to; and by not attending to it, the Reader is made to believe that, according to the Account I have given of Fluxions, there can be no second, third or fourth Fluxion of a Line. Now, in the 25th Page of the foregoing Answer, I supposed the Cube to be generated by an UNIFORM Motion; in which Case the Velocity express'd by a, will be a given Quantity: But there can be *no kind* of Mutation or Change of a Velocity which is given; and consequently no second Fluxion of a Line, nor any fourth Fluxion of a Cube, which increases with such a Velocity. In this therefore I have not endeavoured *directly to overthrow Sir* Isaac*'s Doctrine; I have not, to the great Relief of the learned World, destroy'd* *an indefinite Rank of Fluxions of different Orders*; not have I given an Account of them any way inconsistent with Sir *Isaac*'s Doctrine, as this Author has falsely asserted.

He says, *Sect.* 18. that *I give up Sir* Isaac*'s Doctrine of Fluxions, and instead thereof humorously substitute what all the World knew before he was born, to wit, the three Dimensions of a Cube and the Genesis thereof by Motion.* But this is a Mistake. For I neither give up the Doctrine of Fluxions, nor substitute the Genesis of a Cube by Motion instead of it: I did not introduce that Genesis in order to set aside the Doctrine of Fluxions; but to exhibit a System of Motion which might explain and illustrate first, second and third Fluxions, so as to make their Existence conceivable to the meanest Capacity; and thereby to expose the Weakness and Ignorance of this Writer: And I have succeeded in both; although to his *discerning Eye* it may seem to be a *disguising and betraying and giving up the Doctrine.* According to that Doctrine, the Fluxions and Moments of generated Quantities, are the Velocities and Motions with which the isochronal Increments of those Quantities begin or cease to exist; and though the Generation of a Cube by Motion, might be known *before ever Sir* Isaac *thought of his Fluxions*; yet it was not known, before he publish'd the Principles of that Doctrine, that three distinct Orders of Fluxions or Moments, depending upon each other, existed in and might be clearly and distinctly conceiv'd, by attending to that well known and obvious System of Motion, which exists in the Instant a generated Cube begins to be augmented.

In *Sect.* 20, *He intreats me to explain whether Sir* Isaac*'s Momentum be a finite Quantity, or an Infinitesimal, or a mere Limit.* I tell him, that Sir *Isaac*'s *Momentum* is a FINITE QUANTITY; it is a Product contained under the moving Quantity and its Velocity, or under the moving Quantity and first Ratio of the Space described by it in a given Particle of Time; the Velocity being measur'd by the first Ratio of that Space. Now the Velocity of the moving Quantity, and first Ratio of the Space described by it in a given Particle of Time, being both of them *finite* Quantities, may both be express'd by one and the same Line of a *finite* Magnitude; but that Line does not exist in the Quantity generated or augmented by Motion. The moving Quantity exists both in the Fluent and in the Increment of that Fluent, being the final Limit or the former and the initial Limit of the latter: But the Line which expresses the Velocity, or first Ratio of the Space described by the moving Quantity in a given Particle of Time, does not exist either in the Fluent or in its Increment. By Moments therefore he is not to understand generated Increments of Fluents, but certain FINITE PRODUCTS OR QUANTITIES of a very different Nature from generated Increments, expressing only the Motions with which those Increments begin or cease to exist.

To conclude, if this Author intends to give himself or me any farther Trouble, he must consider these Principles a little better than he has hitherto done, if he expects a Reply. For *I shall scarce think it worth my while* for the future *to bestow a serious Thought on any Writer, who shall* dare to say that *Sir* Isaac Newton *had no clear and steady Notions of his* Moments *and* Fluxions*, and yet leave* what has been offered by *Philalethes Cantabrigiensis* and me, in Defence of that great Man, without a fair and candid Answer.

FINIS.