



An Examination of the 2^d. Part
of M^r. Hume's 1st. Essay.

You begin this Part of your Essay wth.
observing that "It may seem a very ex-
traordinary Attempt of the Sceptics to de-
stroy Reason by Argument & Ratiocina-
tion." By destroying Reason I presume
from the general Tenour of your Expressions
you mean the bringing of it into Doubt
or Dubiety. At least I see nothing in your
Words, that can lead one to a different
Interpretation of the Phrase. Do you
allow that "the Demonstration of some
Principles, w^{ch}. you ascribe to Geometry,
seem as unexceptionable, as that w^{ch}.
proves the three Angles of a Triangle
to be equal to two right ones." And
you grant "that these absurd Opinions"
as you call them, because they startle
& amaze you, as things w^{ch}. you cannot
conceive of, "are supported by a Chain

of Reason the clearest & most natural, &
that it is impossible for us to allow the
Premises without admitting the Con-
sequences. You likewise acknowledge
that the Properties of Circles & Triangles
are the Principles from which some
of these Inferences are drawn, & that
the Demonstrations of these Prop-
erties are so convincing & satisfactory
that nothing can be more so. For
the following
your Words, are these, "Nothing can
be more convincing & satisfactory
than all the Conclusions concerning
the Properties of Circles & Triangles;
& yet if these be received, how can we
deny" &c. Now if by Reason you
understand the faculty of reasoning
or that Power by w^{ch} the mind draws
Conclusions or Inferences from Pre-
misses, w^{ch} are either admitted as
self-evident Truths, or ^{are} Consequences
already derived from such Truths,
I asfirmed you scarce speak intelli-
gibly when you say, "That the Sceptic

makes use of Argument & Ratioc-
ination to destroy Reason or to bring
its Existence into Doubt & Uncertainty.
For what else is this but saying, that
he exercises a Power, in order to
show that it is not. Now you cer-
tainly will grant, that you never
can make use of any thing in order
to prove that it is nothing. If the Ex-
ercise of a thing be real, it necessarily
presupposes the Reality of the thing
itself, since no Use can be made of
nothing. And if there be no reality
in this Exercise, the Consequences
flowing from it cannot be depend-
ent.

But if you mean by Reason, what is
commonly understood by Reasoning,
and the Deductions w^{ch} are come at by
means of it, you cannot undoubtedly
be supposed to affirm in general,
that the Sceptic's great Aim & De-
sign is to destroy these or even make
them Doubtful by Argument & Rati-

...:ocitation. My Reason, for saying so
is this. If any thing, ^{whatever} inferred from a
Chain of Reasoning w. carries with
it the fullest Clearness & Conviction,
can be rendered doubtful by another
Process of Reasoning clear & unex:
ceptionable leading to an Inference
directly opposite or at least different,
this may without doubt become
questionable from a similar Pro:
cess, & the Result of this again un:
certain & so on for ever. So that let
him advance ever so far, all that
he could possibly make of it, would
be this, that it is a very doubtful
matter, whether he had rendered
the thing he intended doubtful or not.
If you mean the Results of reasoning
taken in a general Sense, they will
at last necessarily leave you here.
However this is an Employment
you can hardly ascribe to any Person.
For there never was an Instance
of a Conclusion drawn by perfectly

unexceptionable Steps from princi:
ples equally unexceptionable, that
was rendered uncertain by an op:
posite Conclusion satisfactory &
convincing. No person ever de:
monstrated by steps w. as powerfully
convey Satisfaction to the mind of
every Person that understands y.
that the Angles at the Base of an
Isosceles Triangle are not equal,
as thou, by w. Euclid has proved
that they are; or indeed ever ima:
gined it to be possible. Were you to
appoint him this Task, you would
necessarily make him begin it w.
this Supposition that no reasoning
carries absolute Certainty along w.
it, & with this Design at the same
time, to make use of it, in order to
show that it does not. That is, you
would first make him suppose all
reasoning to be doubtful, & then em:
ploy it to show that it is. But if you

only mean that he is to employ
just Argument & Refutation to
pull Down the Fabricks & Super-
structures w^{ch}. happen to be reared
on false reasoning, thus is assign-
ing ^{him} a noble Office indeed. For next
to the Discovery of Truth, the Detecti-
on of Falsehood is most valuable

But if you only intend to affirm
that by saying that the Sceptic de-
str^{oys} Reason by Argument and
Refutation, that he makes the
of Conclusions drawn ^{clearly} from
exceptionally ^{from} these Premises
clear & unexceptionable, w^{ch}. he finds
to be inconsistent with its Views
as a discerning Faculty or with
some other of its Inferences as a rea-
soning one, in order to make it
doubt both of its Maxims & Conclu-
sions, you must confine your
meaning to those Particulars,
in w^{ch}. it finds this Disagreement
to take Place. This if I mistake

not is your meaning. For after tell-
ing us, that the Demonstration of
some of these Conclusions seems as
unexceptionable as that by w^{ch}. An-
gled that the three Angles of any
Triangle are equal to two right ones
you allege that notwithstanding this
Reason views them as big with Con-
tradiction & Absurdity, & is therefore
thrown into a kind of amazement
and Suspence, w^{ch}. without the Sug-
gestions of any Sceptic, gives her
a Diffidence of herself & of the ground
she treads on. Now I dare say you
will allow that the Sceptic must
confine this Distrust w^{ch}. he makes
Reason entertain of herself by pro-
ducing such Examples to these alone,
& ought never to imagine that it
should be extended to all ^{any of these} Consequences
obtained by Reasoning, between w^{ch}.
& the self evident Maxims of Reason
or other Consequences derived from

them he never discovered any such
Opposition or Incongruity. For if
the Discovery of this Inconsistency &
Disagreement be the only Founda-
tion upon w^{ch} he goes in attempting
to bring Reason into a State of Doubt
& Uncertainty & thus as far as I am
able to discover & I could wish to
allow your Words their full force,
is the only Ground you leave him
to erect his Batteries on, it would
be altogether absurd to suspect him
capable of extending it to Cases
in w^{ch} no such Disagreement ap-
pears. This would be supposing
him to draw Consequences with-
out premises, similar to those he
has drawn from Premises. It would
be making him think pretty near
as wisely as an Engineer, without
the Aid of the Ground, that should
give Directions for erecting a Battery
without the Aid of the Ground or any
other thing to support it, or as a Mason
who should propose to build a house

without a foundation. Reason can
not distrust herself with regard to any
of those clear & unexceptionable Con-
clusions of Reason^{ing}, w^{ch} do not clash
with or run directly in the Face of
her ^{other} self-evident Notions or Conclu-
sions drawn from them by Steps of
indubitable Evidence in the Opinion
of one, who makes the observing of
such Contrariety the sole foundation
for such Distrust. But perhaps you will
say you reason from Analogy & it
were a *parle ad totum*. Point out the
Analogy, & I shall allow your Argu-
ments founded thereon as much force
as any analogical reasoning can
possibly carry with it. Now in all a-
nalogical Inferences, there must be
some resemblance or similitude in
the Circumstances, upon w^{ch} the Ana-
logy is founded. But the only Bottom
you leave the Sceptic for making Reason
rest her Doubt of her own clear & unex-
ceptionable Conclusions on, is this, y^t

that they stand directly opposed to her
other clear & undoubted Maxims, or
to Consequences coming with most
convincing Evidence from them.
I take it for granted you will allow
there is no Resemblance to this Op-
position discovered in those Cases
in w: it is supposed no such Oppo-
sition appears. For if you do not
you will be forced to conclude, that
it both is & is not, at the same time.
If then the only Circumstance on w:
the Inference is founded in the one
Case is not discovered to hold in the
Other, or indeed so much as any
other similar Circumstance, pray
tell me, upon what Analogy do
you ground the same or a similar
Conclusion? If in such a Situation
you draw Consequences, you must
necessarily acknowledge, that you
draw them, not because you see
any Reason for doing so, but be-
cause you suppose there ought to
be one. And if this be the Way in

w: you suppose your Sceptic to draw
Conclusions, I do not see, that you
make him any thing else than one
who does not possess Reason, & whose
is incapable of exercising it.
But this is not all. You grant the
Premises from w: the Demonstrations
you mention are deduced to be so cer-
tainly & satisfactory as I have already
observed, that Nothing can be more so,
being those w: are laid down & de-
monstrated by Euclid in his Elements
of Geometry, to w: like the rest of man-
kind you offer no Objections. You
likewise allow the said Demonstra-
tions to be derived from these by a
Chain of Reason the clearest & most
natural & as unexceptionable as
that by w: it is proved that the three
Angles of a Triangle are equal to two
right ones. I dare say you will agree
with me in thinking that I do you no
injustice here in affirming, that this
is neither more nor less than saying

That you begin wth Principles to the
truth of w^{ch} you cannot object, you
gradually draw ~~Consequences~~ ^{Consequences} from
them, to the Truth of w^{ch} you likewise
cannot start any objection, that you
are ^{fully} perfectly convinced of every Step
you make, and at last come to a
Conclusion w^{ch} you are perfectly
satisfied is fairly drawn. Now I
see no other meaning that this has,
than that your Reason declares it
to be just. At the same time you affirm
that these very Conclusions "shock
the clearest & most natural Principles
of human Reason, & are big with
Absurdity & Contradiction". But this
I suppose you can ^{mean} nothing else, than
y^t these very Consequences w^{ch} your
Reason perceives to be just, shock
your Reason & appear to it absurd
& contradictory. Now what is this
but saying that Reason discovers
them both to be & not to be just. For
I imagine you understand by the

Absurdity & Contradiction of any Con-
clusion, what is generally meant
by ^{it being} the unjustness of it and contrary
to some Maxim or Inference that is
just. For no Consequence whatever
can be contradictory to itself, since
this would be saying expressly that
it is different from ~~itself~~ ^{opposite} to itself.
Perhaps you will allege you do not
see the Conclusion to be just, though
you see it unexceptionably drawn
from unexceptionable Principles.
But this I apprehend is saying pre-
cisely the same thing in different Words.
For you are not here in the same pre-
dicament with one, who objects to a
Conclusion drawn by another, as ex-
ceptionable, because he does not thorough-
ly understand him, or has not per-
fectly clear & distinct Ideas of the rea-
sonableness of the Steps he took to arrive
at it. To him in this Situation it is
no Conclusion. But your Case is
different. Your Inferences are obtained

by means of Steps, w^{ch} are made by
a Chain of reasoning the clearest
& most natural; so that it is im-
possible to admit the Premises without
admitting likewise the Consequences.
And you affect the Premises to be
so convincing & satisfactory that no-
thing can be more so, ~~affirming~~
~~they are as unexceptionable~~ They are
indeed the Propositions in Euclid's
Elements of Geometry, & these I be-
lieve yourself will allow have
a good Claim as any Conclu-
sions to be called just. You likewise
own that the Application of these
Principles are as unexceptionable
as they are themselves, by saying
that they are as much so, as this
Proposition, that the three Angles
of a Triangle are equal to two right
Angles. And if they are so, I scarce
think any thing can be more so. Do
I know a Conclusion that has a better
title to be called just than this Pro-
position? Wherefore you must neces-

sarily conclude that you both see
^{in your Reason} the Conclusions you take Notice of
both to be & not to be just at the same
time; a thing w^{ch} needs only to be
mentioned to any Person possessed
of Reason to be declared by him im-
possible. This Consequence you
seem to have been afraid of, and
I believe every Person will be scepti-
cal in the most dogmatical &
positive manner with regard to
its Possibility. You cannot allege
that there is any Principle of Reason
that has a better Claim to be called
just than these Principles & Conse-
quences, since you affirm that nothing
can be more convincing & satisfactory
than the one, ^{that} the other is equally
unexceptionable, unless you show
there is something else requisite to
denominate any Proposition just
besides that Clearness & Distinctness
w^{ch} makes it convincing & satisfactory.
From this Allegation you ^{are} evidently

excluded by your own Assertions.
But even grant that you are not
& that I should not inust scorn your
own Words on having you shut up
so close, it certainly was incumbent
upon you to have produced
the Principle & to have shown that
it really has a preferable Claim.
And neither ^{these} you know yourself
you have attempted to do. However
when the Dispute turns upon the
Preeminence of one thing in any
particular above another, you will
unquestionably be so reasonable
as to allow that it is necessary
both to produce it, & to bring a Proof
of the Advantages w^{ch} lie on its Side.
For if it is not produced, there can be
no Comparison made between y^m
& consequently no Dispute, & if it is
not produced in such a Way as to
show it possesses the Supremacy, the
whole amounts to nothing but a
mere Affirmation. And you know

that when the Question is with regard
to the superior Degree of Clearness or Evi-
dence w^{ch} one thing possesses above
another, it is not sufficient barely to
affirm that the one is ^{is} more evident
than the other, particularly when
that other is so clear that you can-
not according to your own acknow-
ledgement refuse it. This would be
just asserting a thing to be, & after-
wards leaving nothing but the As-
sertion itself as a Proof of the Assertion.
Youself must acknowledge that you
have neither produced the principles
of Reason, w^{ch} you assert to be quite
inconsistent with the Demonstrations
you mention, nor shown y^t
they possess a greater Degree of Evi-
dence. You indeed observe, that no
priestly Dogmas invented on Purpos-
to tame & subdue the rebellious Reason
of Mankind, ever shocked common
Sense more, than the Doctrine of the
infinite Divisibility of Extension w^{ch}

all its Consequences." As to the Dog-
mas of the Priests, I confess I do not
see how they are connected with this
Subject, & therefore shall not at pre-
sent enter into any Consideration
of them. Besides as your Charge
is general & you have not mentioned
any particular Dogmas, you have
not left these Gentlemen any room
to give you a limited & determinate
Answer; & it would appear that you
did not mean they should give you
any. However as I see no reason
you had to go out of your way to
attack & upbraid them, I shall not
be at the trouble to go out of mine
to defend them. I quoted the Objec-
tion with a quite different Design.
You say that the Doctrine of the in-
finite Divisibility of Extension shocks
common sense. Perhaps you ima-
-gine that one may understand by
what you mean by those principles
of Reason are w^h you say enables you
to pronounce the Demonstrations

you speak of absurd & contradictory.
But I must confess to you, that com-
-mon Sense appears to me so vague
an Expression, that I do not know
what to make of it. I honestly ac-
-knowledge that I do not understand
what is meant by it. It seems to
imply something more than the
principles of Reason; though I can
easily guess that your Intention
was to limit it to these in this
Place, from your observing in the
next Sentence that the same Doctrine
"shocks the clearest & most natural
Principles of human Reason".
Here as you declare that that the
Doctrine shocks common Sense &
in the next Sentence, that it shocks
the clearest principles of Reason, I
presume that you use them in
considering this Subject as synonymous.
And I cannot indeed discern what
other meaning you could ^{w^h propriety} affix to it
where you had professedly to do with
the principles of Reason & their Con-

sequences. Whence it appears that one must still be as much at a loss as ever to know what principles of Reason you mean, since common sense here signifies nothing else but the principles of Reason. I doubt not however that you meant something definite & particular by the clearest & most natural principles of human Reason, since I question not that you meant something, & cannot understand if you did not mean so, how you meant anything directly to the Subject. How is it to be known then what Principles you intended? Must one enumerate all those Principles, & apply them one by one to the Demonstrations relating to the infinite Divisibility of Extension? But how is he to set about this Enumeration, to fix its Limits or after the most painful & diligent Search to be certain that it takes in all those Truths or Propositions w^{ch} appertain to

Reason clear & self-evident, almost as soon as they are proposed to it in terms w^{ch} make them be sufficiently understood. And these if I mistake not are what you mean by the Principles of human Reason. For Reason considered in itself can only be called one & the same Power, or principle, if you choose to give it that Name, w^{ch} makes use of these first distinct or evident Maxims, & exercises itself in a variety of Ways in applying them for the purpose of investigating Truths that lie farther removed & at a greater Distance. Now we know there are many Truths & Propositions, w^{ch} Reason admits as certain & self-evident as soon as they are presented to it in intelligible Terms; tho' if left to itself it might never have thought of them. The Axioms of Euclid are universally allowed to have a Title to be ranked in this Class; & yet I may affirm about

the least Hesitation, that more than
~~three fourths~~ ^{one half} of mankind never thought
of one half of them, or ^{asked} can tell in their
own Words what they are or what is
their meaning. But if you will not ^{allow}
this to be the Case with regard to so great
a Proportion of mankind, I dare say
you will however grant ~~these~~ ^{these} propo-
sitions as the following to be self-
evident to every one who knows
the things of w^{ch} they are affirmed.

A Rhombus is not a Rhomboid, a
Parabola is not an Ellipse, an Hy-
perbola is not a Chonchoid, a Cycloid
is not a Cifoid, a Cylinder is not a
Tetrahedron, a Tetrahedron is not an
Octahedron, an Octahedron is not
a Docecakhedron, a Docecakhedron is
not an Icosahedron &c. &c.

These are Distinct Propositions to every
one who knows these Figures & Solids.
And they will likewise be separate &
Distinct Propositions to Persons who

are informed that these Words denote
quite different things, though they even
should not know what those things are.
And all these particular self-evident Pro-
positions, are but illustrations of this
general one, that one thing is not
another thing. But if you deny that
more than three fourths of mankind
never formed ^{any Idea} nor thought of these Pro-
positions, you must either affirm, if
they know the Figures & Solids to w^{ch}
they relate, or that they could think
of the Propositions, before they had any
Idea or Conception of the things about
w^{ch} they are announced; neither of w^{ch}.
I dare say you will venture to affirm
In like Manner each Property of a Tri-
angle taken by itself may be declared
Different from the several Properties
of a Parallelogram one after another,
each of those of the Parallelogram Differ-
ent from each of those of the Circle, each
of those of the Circle different from each
of those of the Parabola, each of those
of the Parabola from each of those of
the Ellipse, each of those of the Ellipse

from each of those of the Cycloid,
each of those of the Cycloid from each
of those of the Cissoid, each of those of
the Cissoid from each of those of the
Conchoid, each of those of the Conchoid
from each of those of the Quadratrix,
each of those of the Quadratrix from
each of those of the Logarithmic Curve
& so on to Curves of all the different
Orders.

There is a great Number of Ways
in w. an endless or if you chuse
infinite Number of self-evident
Propositions both of an affirmative
& negative Nature may be performed.
I shall just mention one of these
Ways to you, w. is taken from Num-
bers as follows.

2 is greater than 1, 3 is greater than 1,
3 is greater than 2, 4 is greater than 1,
than 2, than 3, 5 is greater than 1, than 2,
than 3, than 4, 6 is greater than 1, than 2,
than 3, than 4, than 5; 7 is greater than 1,
than 2, than 3, than 4, than 5, than 6;
&c; &c. Now these are all affirmative

& it is plain they may be continued
without End, since whether finite nor
any other Numbers can be supposed
to be so often added together, but still
more may be added.

Precisely in the same Way we get an
endless or infinite Number of negative
self-evident Propositions.

Thus 2 is not 1, 3 is not 1, is not 2, 4 is not 1,
is not 2, is not 3; 5 is not 1, is not 2, is not 3,
is not 4; 6 is not 1, is not 2, is not 3, is not 4,
is not 5; 7 is not 1, is not 2, is not 3, is not 4,
is not 5, is not 6; and so on for ever.

The same Truths, that self-evident
Propositions or Maxims of the Under-
standing both of an affirmative and
negative Nature ^{are as plain as numbers} might be shown
in a great Variety of other Ways.

But I am persuaded, you will allow
it to be sufficiently clear from what I
have already observed. If by the clear
& natural Principles of human
Reason you mean such Truths as
the Understanding allows to be self-e-
vident as soon as it attends to them, &
I see nothing else that you can mean

by them, you ^{must charge} see that to enumerate
them would be an endless Under-
taking. If then your Reason sur-
mised you with Truths so clear as
to enable you to pronounce Con-
clusions to be absurd, we are drawn
as yourself acknowledge ~~by~~ ^{by} ~~the~~ ^{the}
of Reasoning as unexceptionable
as that by w. the three Angles of a
Triangle are equal to two right Angles,
from Principles contained in the
Elements of Euclid, it was certainly
your Business to have produced
these Truths, that the world might
have judged of the reasonableness
of your Assertion with regard to a
Matter w. you was professedly
making use of to destroy the Certain-
ty of Reason. But this you have
not done. Perhaps you will tell me
that your Reason made you pro-
nounce them absurd, by means
of something you cannot condescend
upon, & in a way you cannot describe.
But this Manner of speaking seems

to me very exceptionable & almost
unintelligible. For how are you to
know that it was a Principle of Rea-
son w. made you draw the Conclu-
sion unless you can condescend
upon it or show what it was, might
it ^{not} in this Case have been something
else than Principles of Reason, that
made you declare the Consequences
of the Demonstrations you mention
to be absurd. How are you certain
that it was not some vulgar Prejudice
with regard to the Nature of Extension
acquired by your Senses, somewhat
like that w. makes the ignorant &
illiterate imagine the Sun & Stars
to move round the Earth once in 24
hours, & pronounce the opposite opi-
nion of the Earth's Motion absurd?
You may alledge it is true, that in
common Life People very frequently
without any simple Asert such & such
Propositions to be nonsense, & others
to be true & unquestionably certain,
before they attend to the Principles

from w: they derive these Assertions
to see whether they are founded in
Reason & Prejudice or partly in both.

No doubt they do, & for that very
Reason judge often rashly; & draw
many foolish & ridiculous Conclusions.
But unless they examine them to see
that those are really ^{self-evident} maxims of
Reason w: they go upon, & take
Care to separate them from the Pre-
judices & professions w: spring
from Custom, Education & other
the like Causes, instead of amounting
any to more than counter Evidence
to truths w: Reason looks upon
as self-evident or Consequences
derived from them by Steps the
most satisfactory & convincing, they
even come short of a Presumption
in prejudice to their Certainty.

I endeavoured to show by taking your
Words in no stricter a Sense than
they may be taken in without doing
you any Injustice, that your way

Assertions imply an Impossibility.
You confess yourself that they seem
to contain an Absurdity, w: makes
you doubt even of your Doubts.
After attempting to demonstrate
that what you affirm is impossible,
I allowed you a wider field, & have
examined every Supposition
I could think of, from w: you could
receive any Aid, & upon examining
them have been unable to find
that any Advantage can accrue
to your Opinion from them.

Thus much may suffice for the
Nature of your ^{Attack} Attempt. I shall
now examine the particulars of it
upon w: you ground it.

The first then you take notice of is
this. "A real Quantity infinitely less
than any finite Quantity, containing
Quantities infinitely less than itself
& so on in infinitum; I would fain
ask you where you met with a De-
monstration of this, or what Geometrical

either asserts or demonstrates it. I
have examined the Demonstrations
with regard to the infinite Divisibility
of Extension w^{ch} are given by those
who are reputed the best Geometers
who treat of this Subject, & I cannot
safely say that I never discerned any
thing in them, that gives the least
Countenance to such a Conclusion.
I have likewise considered the Obser-
vations of some Metaphysicians
in relation to the same Doctrine,
& have not been able to discover any
thing asserted by them similar to this Con-
sequence w^{ch} you charge them as
well as the Geometers with. I strongly
suspect that there is some mis-
take with regard to it. I do not ima-
gine that you would have imposed
such a Conclusion to them, if you
had not been persuaded that they
had actually drawn it (taking it
for granted that you are more of a
Gentleman than to ~~doe~~ do so).
But I cannot help entertaining

strong Suspicions, that you have
been imposed on with regard to this
matter in some Shape or other, &
taken it upon Trust. However if
you will be so good as to mention
one Geometer or Metaphysician, that
so much as asserts it, I think I can
show you in a Way quite satisfactory
that the very first Step of the ^{general} Conclu-
sion is so far from being unaccepti-
onable, that it contains a palpable
absurdity & flat Contradiction. And
to convince you that I do not pretend
to more than I can effect, I beg your
attention to what I am now going
to say. You will readily allow I
dare say that a Quantity or Magni-
tude must either be finite or infinite.
You will I am persuaded as readily
acknowledge that an infinite Mag-
nitude is greater than any finite
Magnitude of the same kind, & if
it is possible for any Magnitude
to be infinitely less than the last, it is

likewise a fortiori possible for it to be infinitely less than the first.

In the first place then let the real Quantity or Magnitude you speak of be a finite Magnitude or Quantity.

Then a real Quantity infinitely less than any finite Quantity, comes to this a Quantity infinitely less than itself, w. is impossible.

Next let it be an infinite Quantity or Magnitude. Then since an infinite Quantity is greater than any finite Quantity of the same kind, a quantity infinitely less than any finite Quantity, must be infinitely less a fortiori than an infinite Quantity of the same kind, that is, must be infinitely less than itself, w. is impossible. Perhaps you will allege that I am not dealing fairly by you here, & that this w. I have just now shown to be impossible, is a part of that very Conclusion your Reason tells you is absurd. You

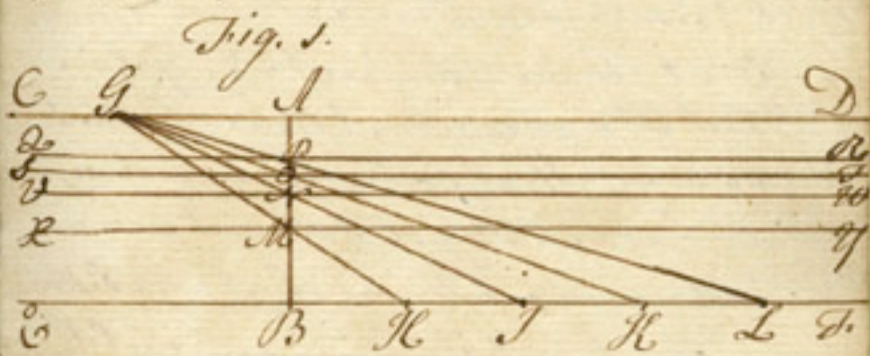
must grant then your Conclusion to be endless or infinite, since it says that this said imaginary Quantity w. I have shown cannot exist in Nature, contains Quantities infinitely less than itself & so on in infinitum. Here then it is evidently made a Step upon w. an infinite Number of others in the scale hang. Besides you may be very justly called upon here to produce the Demonstration upon w. this Step depends. I positively deny the Existence of any such Demonstration. But granting it even to exist, we must certainly conclude that it is incumbent upon you to produce it for Examination; and if it can be shown you in so satisfactory a manner that it is faulty as to convince you, that part of your attack upon the Certainty of Reasons founded thereon must undoubtedly fall to the ground. Be so kind then as to produce your Authority for it if you can find any,

that it may be examined. I am almost confident that you cannot & that you have been originally mistaken with regard to the fact.

I shall now endeavour to show you all that is generally allowed by Mathematicians to be understood by the infinite Divisibility of Extension, & to convince you that it does not run counter to any one Principle of Reason.

Let AB represent any Part of linear Extension however small, & through the Extremities A, B of this lineal Extension let two parallel right Lines $CD, E F$ be conceived to be drawn. Let any point G be taken at pleasure in one of these Lines on one Side of AB , & let equal parts be set off on the other of these Lines & on the opposite Side of AB . Then since parallel Lines are such as though produced ever so far will not meet, it is evident

that though the equal Parts BH, HI, IK, KL &c. be continued on ever so far they will not meet with the right Line CD produced. Now let the right Lines GH, GI, GK, GL &c. be drawn,



Then it is evident, since none of the Points H, I, K, L &c. though BH should be set off on $E F$ produced in continued Succession without End, can ever meet with CD , that none of these right Lines can ever coincide with CD . But since the Angles GHI, GKB taken together make two right Angles (12. E. 1) or w^c comes to the same thing since the right Line GH falls upon the right Line $E F$, GH, I are not in the same straight Line. Con.

Consequently GH is a Triangle, &
 G intersects AB in some point
 N nearer to A than the Point M ,
in w. GH intersects it.

In like Manner it is shown that
 GH intersects it in a Point O near-
er to A than the Point N , GH in
a Point P nearer to A than the Point
 O & so on. That is each succeeding
Line cuts AB in a Point nearer
the Extreme A than that in w. the
immediately preceding one cut it.

But as the Number of the Points
 H, I, K, L &c. may be increased
without End, so may likewise the
Number of the intersecting Lines
 GH, GI, GK, GL &c. w. is always
equal to the number of the said
Points; and of necessity the Num-
ber of the Points of Intersection
 M, N, O, P &c. may be increased
ever so far without our ever ar-
riving at the Extreme A .

After the same Manner, if through
the Points of Intersection $M, N, O,$
 P &c. though ever so great in number
right Lines $X Y, U W, S T, Q R$ &c.
be drawn, it may be demonstrated
by a similar Process, that though
we should make ever so many
Intersections of AM, AN, AO, AP &c.
respectively by means of Points
taken in AM, AN, AO, AP &c.
respectively; we could never reach
the extreme A .

Whence it is evident that after ever
so many Intersections of the Linear
Extension AB , or of the Parts $AM,$
 AN, AO, AP &c. there still will
remain a Part adjacent to the Ex-
treme A w. is real & finite

This Demonstration contains the Sub-
stance of what is generally advanced
by Geometers with regard to the Diver-
sibility of Linear Extension, tho' expressed
in a somewhat Different Manner; and

indeed comprehends the Substance
as a great Measure of what has
been or can be advanced concern-
ing this Matter from Principles
purely geometrical. For the var-
ious Methods of demonstrating
^{by different Diagrams}
it, when properly conducted, and
cautiously expressed, ultimately
leave one in the same Conclusion.

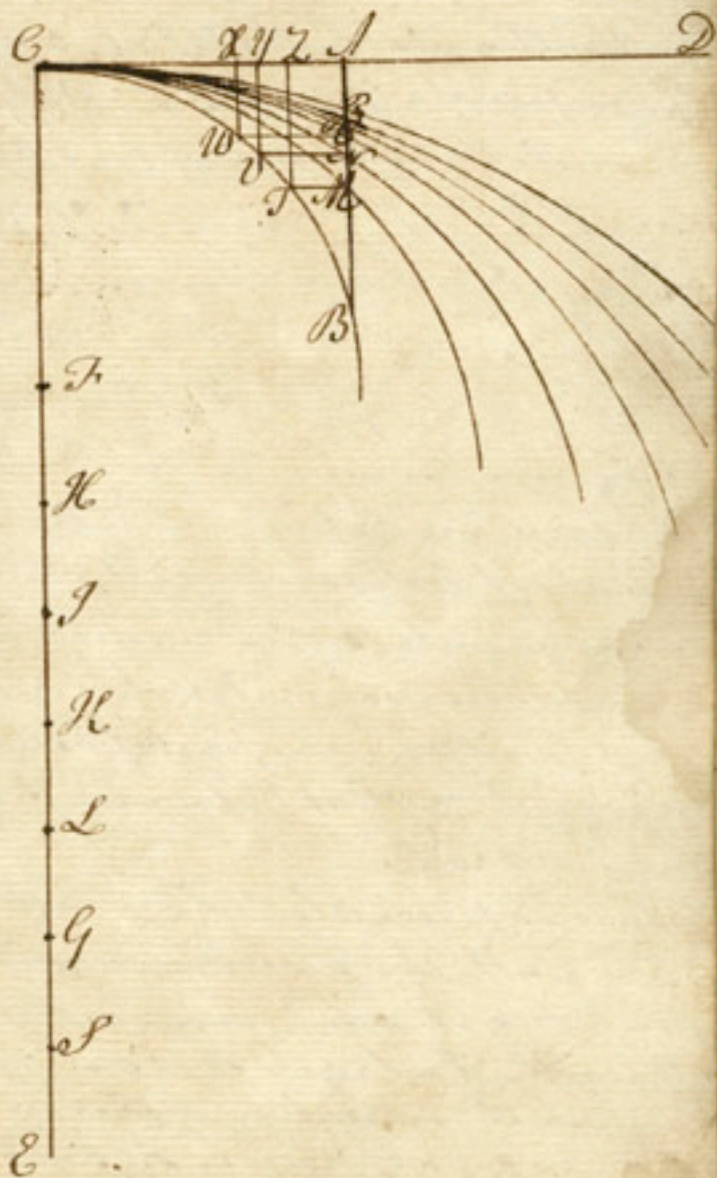
I have here supposed the Lines
 XY, VW, ST, QR &c. to be drawn
parallel to CD, E & F , tho' Mathematicians seldom draw them
thinking the Matter plain enough
without them, in order to show
you, that the Line AB be in-
tersected ever so often, yet each
even the smallest of the Parts ly-
ing between the Extreme A & the
Points of Intersection, though in-
tersected themselves in like man-
ner ever so often, will still leave
a real finite part adjacent to the
Extreme A .

Let us now take the well known
Method of illustrating it by means
of Circles, & push the Illustration
a little farther than is usually done,
for the Sake of Perspicuity.

Let AB be the linear Extension as be-
fore. From any Point F without it
as a Centre with the Distance F, B
describe an Arc of a Circle. Through
the Point F draw an indefinite right
Line CE parallel to AB & meeting
the Arc described in some Point C .
From the Point C draw an indefinite
right Line CD at right Angles to CE .
Take on CE from the Point F any
number of equal Distances $F, H,$
 $H, I, I, K, K, L, L, G, G, S$ &c. and from
the Points H, I, K, L, G, S &c. as Centres
with the Distances $H, C, I, C, K, C, L, C,$
 G, C, S, C &c. respectively describe Arcs
w^h will cut AB respectively in Points
 M, N, O, P, Q, R &c. Now this con-

:Dent that the further any one of the
 Points in the Line CE is removed
 from C , the nearer will the Arc de-
 scribed from it as a Centre cut AB
 to the Extreme A . And since CD is
 a Common Tangent at the Point C
 to all the Arcs that can be described
 from the Points H, I, K, L, G, S &c.
 with the Radii $HC, IC, KC, LC,$
 GC, SC &c. if the number of these
 Points be increased ever so far, just
 so far will the Intersections $M, N,$
 O, P, Q, R &c. of AB be increased.
 But though the number of the in-
 tersecting Arcs should be increased
 ever so much, they must still fall
 below their common Tangent CD ,
 in every Point but C where they
 meet it. Whence it is evident, if
 if we should suppose the Number
 of the Intersections to be increased
 ever so far, there still would remain
 a real & finite Part of linear Extension
 adjacent to the Extreme A .

Fig. 2.



From the Points of Intersection
 M, N, O &c. Draw $M I, N V, O W$ &c.
parallel to CD & meeting the Arc CB
in the Points I, V, W &c. and from
these points Draw $I Z, V Y, W X$ &c.
parallel respectively to AB & meet-
ing CD in the Points Z, Y, X &c.

Then it may be shown precisely
in the same way, that each of the
Lines $Z I, Y V, X W$ &c. w. are
respectively equal to the Parts lying
between the Extreme A & the several
Points of Intersection M, N, O &c.
may be intersected a number of
Times ever so great, & still leave a
real finite linear part of Extension
adjacent to that Extreme w. is in
the Line CD .

This is precisely the same Conclu-
sion with the preceding one drawn
from Fig. 1. and no geometrical
Process whatever can carry one
beyond it in treating of the Divisibility
of linear Extension. In short this

is all that is meant by Geometru-
sians when they speak of the infi-
nite Divisibility of ^{such} Extension.

I shall now show you how the same
Reasoning may be applied to Super-
ficial & solid Extension.

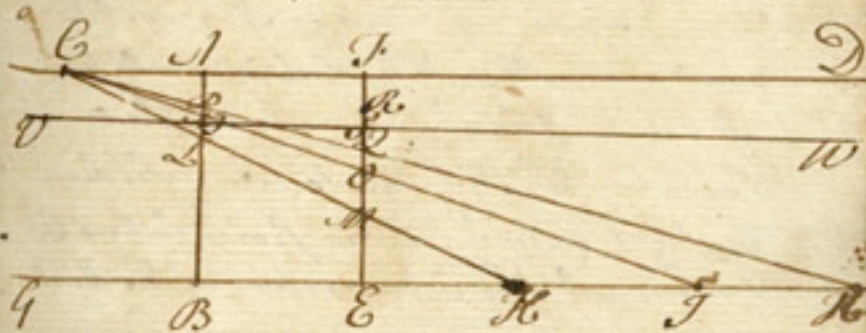
Let $ABED$ represent in general
any one of the four Species of Parallelo-
grams, to wit the Square, Rectangle,
Rhombus & Rhomboid. ^{Let the Sides AB, BE be produced indefinitely} Take any
Point C without it in the Line CD ,
and on CE from the Point E set off
equal Parts EH, HI, IK &c. Then it
is evident that, if CH, CI, CK &c. be
drawn, their Intersections L, M, N
 O, P &c. with the Parallelogram will
cut off Trapezia $BELM, LMOX,$
 $XOPQ$ &c. But ^{the} Number of the
equal Parts EH, HI, IK &c. should
be increased ever so far, those of their
Extreme Points H, I, K &c. would
meet with the Line CD produced.
Therefore ^{the} right Lines intersecting

the Parallelogram, though their Num-
ber should be ever so much increased
would ever coincide with the Line CD .
Consequently there always will re-
main Trapezia $ALMP$, $ANOP$,
 APQ &c. between the Linear Extremes
 AP of the Parallelogram & its Inter-
sections LM , NO , PQ &c. with the
said right Lines, let their Number
be increased ever so much.

In like manner it may be demon-
strated, that if the Trapezia APQ
&c. be reduced to Parallelograms ^{equal}
to them, by bisecting the Differences
 RQ &c. of the Sides PQ , AP &c. of the
Trapezia, and drawing Lines thro'
the Points of Bisection. &c. each of
these Parallelograms tho' interceded
ever so often, will still leave a real
single Trapezium adjacent to the Es-
treme AP .

Also if the Points A , E had been
joined, & right Lines drawn from

the Point A , to the several Points H , I ,
 K &c. there would successively Triangles
be cut off from the Triangular Space APQ
& tho' their Number should be increased
ever so much, there still would remain



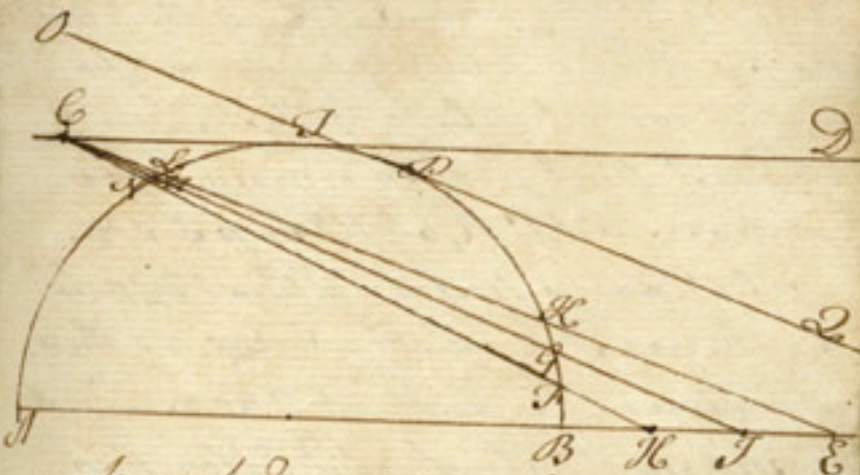
a Triangle adjacent to the Side AP .

The same Conclusion might be
drawn with regard to all rectilinear
Figures, either by reducing them to
Parallelograms by (H. 5. C. 1.) or with-
out doing so.

Now let $ATBA$ represent the
Space contained by a Segment of
any Curve whatever, let the Base
 AB be produced indefinitely, & let
 CTD be a Tangent to the Curve, &
parallel to AB . Let there be any

Point C taken in the Line CD on
 one side of the Point of Contact I, and
 let equal linear Parts BH, HI, HX
 be set off in an opposite Direction from
 I on AB produced. Then it is evident
 that just so many Area or Spaces AB
 GH, AG, M, M, H, L &c. will be
 cut off from the Segment, as there
 are Points H, I, E &c. to w. right lines
 are respectively drawn from the Point C,
 But though the Number of the Points
 H, I, E &c. should be increased ever
 so much, none of them would ever
 meet with the Line CD. Whence it
 clearly follows, that though the Num-
 ber of the Area cut off from the Seg-
 ment should be increased ever so
 much, there still would remain a
 Segment adjacent to the Point of Con-
 tact I.

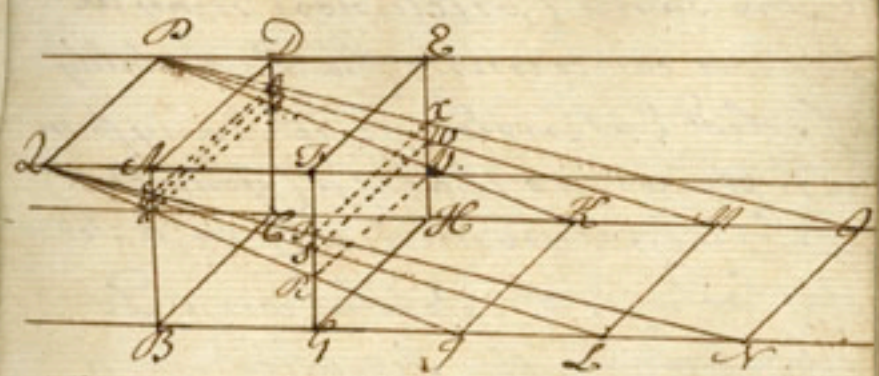
And if right Lines OQ &c. were drawn
 parallel to the Bases LK &c. of the
 Segments, & touching them in Points
 P &c. it might be demonstrated in the
 same Way, that each of them though



intersected in a similar manner
 ever so often would still leave a real
 finite Segment adjacent to its cor-
 responding Point of Contact.

Lastly let ABCDE & FGH ^{represent} denote
 in general any ^{one} of the four different Spe-
 cies of Parallelograms, comprehended
 respectively by 6 parallel Planes, w.
 are Squares, Rectangles, Rhombuses &
 Rhomboids, and let the Planes AD
 E, BC & H be produced indefinitely.
 In the Plane ADE F produced draw
 PQ ^{at any distance from one side of the parallelogram} parallel to AD, & at equal Distances
 G, I, J, L, M &c. taken in an opposite

Direction from the other Side of the
 Parallelopiped, draw IK, LM, NO &c.
 in the Plane $BCGH$ produced, & par-
 allel respectively to GH . Then it
 is evident that just so many Inter-
 sections as $VR, bh, WS, cp, \& I$ &c.
 will Planes passing thro' PQ and
 the Lines IK, LM, NO &c. as there
 are Lines IK, LM, NO &c. and just
 so many Parts of solid Extension
 as $BCD, UHGR, bad, h, W, VRS,$
 $cb, h, p, \& W, S, I$ &c. will be cut off by
 these Intersections. But to explain
 since parallel Planes thro' produced
 ever so far will not meet, it is plain
 that though the Number of the Lines
 IK, LM, NO &c. be increased ever
 so much, none of these Lines will
 be in the Plane $ADEI$ produced.
 Wherefore thro' the Number of the In-
 tersections as $VR, bh, WS, cp, \& I$ &c.
 should be increased ever so much,
 they all would be behind the Plane
 $ADEI, BCGH,$ & consequently



these would still remain a part of
 the solid Extension adjacent to the
 Plane $ADEI$.
 And if the Differences between $EV,$
 Dd &c. be bisected, and Planes be
 drawn through the Points of Bisection
 parallel to $ADEI$, it may be demon-
 strated in like manner that each
 of the Parallelopipeds formed thereby
 will be respectively equal to the
 Solids $Aad, D, E, VR, I, Ab, h, DE, WS, I,$
 $Ac, p, DE, \& I, I,$ &c., though intersected
 ever so often in a similar manner,
 will still leave a part of solid Exten-
 sion adjacent to the Plane $ADEI$.

The same Conclusion may be drawn concerning the Divisibility of solid Extension under any form whatever, as that of a Cylinder, a Sphere, a Pyramid, a Cone, a Tetrahedron, an Octahedron, a Dodecahedron, an Icosahedron, a Spheroid, a Conoid &c.

These Conclusions contain the Substance of all that has been advanced by Geometricians or indeed can be advanced by them from Principles purely Geometrical with regard to what is usually called the infinite Divisibility of Extension. It might perhaps be as proper to call it the indefinite or unlimited Divisibility of Extension. But to dwell long on this Topic would be to quibble & dispute about Names. And if we examine attentively our Notions or Conceptions with regard

to Infinitude, we shall find that we have really no Idea of such a thing as it is in itself, but that being conscious ~~we~~ can conceive of Processes carried on Step by Step indefinitely, we come to get this Idea that there is such a thing as we never can reach by any Process or Operation however far continued, & w^{ch} is as it were the Locus & Compuser of all things.

Thus for Example, if ^{we} suppose the Parallelopiped in the last Figure to be a Cube, we can easily conceive that by a continued Addition the three linear Dimensions of it may be gradually increased indefinitely, and thence come to form this Idea, that there is such a thing as the To ∞ or an infinite solid Extension, w^{ch} must be the Locus of the said Cubic Solidly increased to a Degree ever so great, & w^{ch} it can never fill. We

thareby get this Idea, that it is; but we get no Idea of itself or of what it is.

In like manner by concerning the two linear Dimensions of a plim Surface to be continually or indefinitely increased in all Directions we get this Idea, that there must be infinite Superficial Space, in w^{ch}. this increased superficial Space is comprehended, & which it can never fill. And in the same way ^{by} concerning a line to be continually or indefinitely increased or produced, we obtain this Idea, that there must be infinite linear Extension, in w^{ch}. this Line must always be, & w^{ch}. it can never equal. Methods somewhat similar to these must every Person make use of to come by these Ideas, if he wishes to have them. Let any

man who has formed these Ideas examine his own mind, & say whether he did not acquire them by some way or other similar to what I have mentioned. I dare say he will not affirm that he has any distinct Idea of ^{infinite} Space itself, or of what it is, tho' he has this Idea that it is. And I am fully persuaded that the Bulk of mankind never formed any such Idea, & that their notions w^{ch}. regard to Space seldom reach far beyond the Information of their Sense. Pray what else do people mean by saying that Number in its own Nature is infinite, than this, that no Number can be so great, that still more may not be added to it? Thus by adding 1 to 1 for 2, 1 to 2 for 3, 1 to 3 for 4, 1 to 4 for 5, 1 to 5 for 6, 1 to 6 for 7, &c. & saying that this Operation may be continued indefinitely, we get the

Idea of Number's being infinite.
In like manner we come at
this Idea that Number is infinitely
Divisible, by finding it to ^{be} divisible
indefinitely. Thus the Terms either
of the following arithmetical or geo:
metrical decreasing Series may
be continued indefinitely.

$\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{6}, \frac{1}{7}, \frac{1}{8}, \frac{1}{9}, \frac{1}{10}$ &c.

$\frac{1}{7}, \frac{2}{9}, \frac{2}{11}, \frac{2}{13}, \frac{1}{15}, \frac{1}{17}, \frac{2}{19}, \frac{1}{21}, \frac{1}{23}$ &c.

$\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \frac{1}{32}, \frac{1}{64}, \frac{1}{128}, \frac{1}{256}, \frac{1}{512}$ &c.

$\frac{1}{7}, \frac{1}{14}, \frac{1}{28}, \frac{1}{56}, \frac{1}{112}, \frac{1}{224}, \frac{1}{448}, \frac{1}{896}, \frac{1}{1792}$ &c.

Now if we suppose I w^e may de:
scribe Unity of any thing, to represent
a Mile, a Yard, a foot, an Inch &c. &
^{of these} ^{expressions}
the Numbers 2, 3, 4, 5, 6, 7, 8, 9, 10 &c.
the Denominators of the Terms in the
last arithmetical Series, to express
respectively the Part of any one of
them, w^e remains after each successive
intersection or Division, it is evident

that though the Series should be conti:
nued indefinitely & the Number of the
Terms become ever so great, there still
would remain Part a real Part of the
Extension, w^e part though divided in
a similar manner ever so often
would likewise still leave a real part
of Extension, & so on continually.
And all this is perfectly reconcilable
to every Principle of right Reason.
For none of these Operations how:
ever far continued is infinite, but
the infinite Divisibility is that w^e
comprehend them all, & w^e they
never can reach or equal, though
ever so often repeated.

In the first Case we supposed Unity
to be continually added to itself, tho'
any other Number or Numbers
might have been used as well.
In this there is likewise an Addition
tho' of a different kind, Unity being
successively added to the Denomi:
nators of the Terms of the Series.

In the one the Number however great
always expresses the Multiple of
a Mile, a Yard, a Foot or an Inch &c. of
linear, superficial or solid Extension
in the other, the part.

In the same Way the number 2
is successively added to the Deno-
minators of the terms of the second
Arithmetical Series. And in the
two Geometrical Series the Deno-
minator of each Term is added to
itself to form that of the immediately
succeeding one. To illustrate the
general Idea I might make the
of an endless Variety of different
Series both Arithmetical & Geome-
trical. However I imagine these
^{part of your} few ^{Dem. illustrations} will be sufficient to let you un-
derstand my meaning, & to con-
vince you that what is generally
called the infinite Divisibility of Ex-
tension is not repugnant to any
one Principle of Reason, when

properly understood & examined.
Before I proceed any farther I shall
consider the
However I still cannot help observing
that I could wish you had not spoken
in a manner quite so vague & unde-
terminate, and I appeal to yourself
if you have not done so, in mention-
ing the clearest & most natural Prin-
ciples of human Reason, by w^{ch} I pre-
sume you meant some Axioms or
self evident Truths, w^{ch} you affirm
enabled you to pronounce the Doc-
trine of what is usually called the
infinite Divisibility of Extension ab-
surd & contradictory & w^{ch} you have
not been so good as to specify or men-
tion.

Before I proceed to examine the second
part of your Charge w^{ch} on Geometry
I shall consider the Note you annex
to the first part of it. Your Words are
these. "Whatever Disputes there may

be about Mathematical Points, we
must allow, that there are physical
Points; that is parts of Extension, w.
can, ~~not be divided~~ ^{not be divided} be referred either by the
Eye or Imagination. These Images
then w. are present to the Fancy or
Senses, are absolutely indivisible,
& consequently must be allowed by
Mathematicians to be infinitely less
than any ical Part of Extension; &
yet nothing appears more certain to
Reason, than that an infinite Num-
ber of them composes an infinite
Extension. How much more an
infinite Number of these infinitely
small Parts of Extension, w. are
still supposed infinitely divisible?
Here you in the first Place make a
Distinction betwixt mathematical
& physical Points; and since the for-
mer of these have from their Definition
no Parts of Extension, & the latter
are expressly Defined by you to be
Parts of Extension, the only Distin-
ction betwixt a mathematical & phy-

ysical Point evidently consists in
this, that the one is not, & the other is a
Part of Extension. I can easily dis-
cern that in this Note you exclude
the Existence of Matter by your call-
ing these Parts of Extension Images,
a method of speaking w. you know
yourself you have borrowed from others.
I fancy you think yourself sufficiently
authorized to do so by one Objection to
it, w. you have added in the first
Part of your Essay, to those w. were
formerly started by Dr. Berkeley & others.
However I shall not dispute with
you in this Place the Property of
your doing so, since the Existence of
Matter does ^{not} in the smallest Degree
affect the reasoning I am ^{now} engaged
in. I shall even grant you what
you assert, & surely you cannot ask more
you positively affirm, than that these
Physical Points as you call them
are absolutely indivisible. And though
I should not allege that they cannot be

infinite both because if they were,
they never could make up a finite
Extension of the same kind, & because
we cannot conceive it to be possible
for infinite indivisible Extension
to exist, I say that although I should
not even have recourse to these Ar-
guments, your own words exclude
you from the Privilege of asserting
them to be so, since you say that it
takes an infinite Number of them
to compose an infinite Extension.
They must of Necessity then be finite
Parts of Extension, & since they are
Points, you seem confined to linear
Extension. But the Extremes of any
finite linear Extension are mathema-
tical Points; and as you have offered
no argument to show that the Use
of such Points is not perfectly scien-
tific I am certainly at full Liberty
for any thing that you have advanced
to use them. Now it is evident that
between any two mathematical

Points however near ~~each other~~
each other, there must necessarily be
other such Points, w^{ch} as necessarily
divide the ^{Part of} Extension betwixt them
into smaller Parts of Extension. For
If you deny this you must hold
their ^{total} ~~total~~ compression, & consequent-
ly no part of Extension to lie between
them, w^{ch} is fundamentally & essen-
tially contrary to your Supposition.
For since mathematical Points
have no Magnitude nor Parts of any
kind & of Course can be no parts of
Extension, they cannot touch one
another & at the same time remain
distinct & separate, nor do they admit
of partial Compression. But even
supposing that to be possible, w^{ch} in its
own Nature is altogether impossible,
to wit, that they could either touch or
partially compress each other, we
should find that the Supposition would
not make one single whit more for you
Opinion! I have made more Conceptions

in your favour in the Course of this Examination, than I was under any Necessity of doing, & I will still make more.

"Here then you are unavoidably under the Necessity of asserting these Points you speak of to be Inconsistent in their own Nature, since if you do not, you necessarily hold them both to be & not to be Parts of Extension at the same time, I shall even allow that you meant by these ~~Physical~~ Points, superficial Parts of extension. Then since the Extremes of such Parts of Extension are mathematical Lines w^{ch} are mere Length or linear Extension without Breadth, it is plain that between them there must necessarily be other such Lines, w^{ch} as necessarily divide each of these Parts of superficial Extension into other such Parts. For if this be denied it manifestly follows, that these

mathematical Lines or Extremes totally penetrate each other, & consequently admit no ^{such} Extension between ^{them}, w^{ch} is diametrically opposite to the Supposition.

Lastly I shall suppose that you meant by these Points, solid Parts of Extension, & see what you can make of this Supposition. Then since the Boundaries or Extremes of a Solid are Surfaces w^{ch} are mere Length & Breadth without thickness, it is evident that between any two of them, however near to each other, there are necessarily others, w^{ch} as necessarily divide this Solid Part of Extension into other such Parts. For if you refuse to admit this Conclusion, you must necessarily admit the total Impenetrability of these surfaces, & of Course allow that there is no Part of solid Extension between them, w^{ch} is perfectly destructive of the Supposition. So

that, taken you must necessarily grant
that the Supposition of indivisible
Parts of Extension, take it what way
you will unavoidably leaves you
in a manifest Absurdity. And I
would ask yourself if in Drawing
these Conclusions, I have attempted
to cut off any of your Resources, or
once endeavoured to rob you of any
thing that could make for your Opinion.
What I have now said amounts to a
Demonstration drawn from self-evident
& most unexceptionable Principles
of Geometry, & w^{ch} you have
not once endeavoured to attack,
that the measure of Extension, to wit
the Eye & Imagination, upon w^{ch} you
ground your Assertion is perfectly
altogether false. I need not indeed
have taken the trouble to demonstrate
it to be so. Had you barely affirm'd
that the Eye & Imagination, are the
measures of the Durability of Extension

without bringing one Argument
to support your Position, I might have
answered it by merely asserting the
Contrary, & could with as much Justice
have demanded Audience to
my negative as you could to your
affirmative Assertion. For one Assertion
may very justly be placed
in Opposition to another. But I
chose to take a more demonstrative
method of going to work, though I
was under no necessity of doing so.
Besides proving however from certain
& unexceptionable Principles the
Absurdity of the Opinion w^{ch} you have
taken up with regard to this Subject,
I think I can point out the Mistake
upon w^{ch} your Observations in this Note
are founded. You first affirm that
the Eye & Imagination are the ultimate
measures of the Durability of Extension

in saying just that there are parts
of it w^{ch} can neither be divided or lessened
by them, & then concluding that these
Parts are absolutely indivisible.

By observing that there are Parts of
Extension w^{ch} the Imagination
can ^{neither} divide or lessen, I presume,
you mean that the mind cannot
form distinct Ideas of Parts
or Divisions beyond these. I also
take it for granted that you make
the Imagination keep Pace with
the Eye in this respect. Nay if you
are consistent with yourself you
must do so. For if you allow that
the imagination can furnish us wth
distinct Ideas of Parts & Divisions
beyond the Images got by the Eye
(to adopt your own Language, since
whether we use it or not, it can make
no Difference in the Reasoning) you
must certainly grant that the Eye is

not an ultimate Measure of these
things, w^{ch} is contrary to your Sup-
position. Or if you will not acknow-
ledge this, you must confess that the
Information given by the Imagination
is false. Whence then, since you
are under the necessity of acknowledging
either that these Measures are of the
same Extent or that one or the other
is false, w^{ch} acknowledgement would
surely render the other very doubtful,
it is plain that they must stand or fall
together. You seem to me then in this
Particular to have confounded the dis-
tinct Idea of a thing wth its Nature, with
the Ideas of the Possibility & Necessity of
the thing. For finding your Eye & Im-
agination as far as they go to agree per-
fectly with Reason in declaring Ex-
tension to be divisible, when these stop
short, you conclude that it is no farther
divisible. But you will certainly allow
that tho' you cannot have a clear Idea of
a particular thing, of its Nature, of how it is

that you can ^{form} such Ideas as these, that
it may be or that it is necessary.

The Idea of a thing is totally distinct
from the Idea of the Nature of the thing
and of the manner in w. it is; and these
again are perfectly different from the
Idea of the Possibility of the thing or from
the Idea of its Necessity. The first of
these however you have confounded
with these two last, as is plain from
your concluding, both that the Durability
of Extension is not, & is not possible
beyond the Limits of your Eye & Imagination,
because you have no distinct
Idea of it beyond the Information w.
they give us of it. I dare say you would
not take it well were I to allege that
you sometimes draw Conclusions w.
out Evidence or Premises. But I leave
it to yourself to determine in the present
Case, whether it was not incumbent
on you to have shown that
there is no Difference between those
Ideas, & that they are entirely ^{the same} ~~the same~~
^{on each other}, before you argued from the Extension
of the one to that of the other.
It was certainly necessary for you

to have attempted & not only attempted
but accomplished this Proof before you
ventured upon your Conclusion, w.
however you have not once offered to do.
Indeed were you to attempt such a Proof
I should not hesitate to say to you *Algeum
navigis*, since I think the Contrary
may be shown to be true from a great
Variety of Instances. Take the following
one, w. I hope will convince you of the
Truth of what I now say. Suppose then
that you take a Boy, who simply un-
derstands what is meant by a Circle
& a right angled Triangle, & knows no-
thing about the Properties of these Fi-
gures. Tell him that it is possible for
the two Circles Described on the Sides
comprehending the right Angle to be
equal to the Circle Described on the Hy-
pothenuse or the Side opposite to the
right Angle, & he will easily under-
stand your Assertion, though he himself
does not discern the Possibility. Again
tell him that it is possible to demonstrate

this Equality, & he will easily under-
stand you, though he does not himself
see the Possibility of the Demonstration.
In like manner inform him that this
Equality necessarily takes Place, ^{that}
it is impossible it should be otherwise,
and he will readily conceive your
meaning, though he does not see
this necessary Equality itself. Tell
him again that this ^{has} been demon-
strated or proved, & in Effect by Euclid
himself, as appears from (2. L. 12. 18. E. 5
& 47. E. 1.) whose Demonstrations you
positively affirm in the Beginning
of your 4th Essay are not only true,
but will remain for ever so inde-
pendent on whatever is existent in
the Universe; I say tell him this, &
he will immediately understand
you, though he has no Conception
of the Demonstration or Proof of this
necessary Equality. I might multi-
ply Examples to this Purpose, but
it is needless to do so, since from the

one I have now made use of it is suffi-
ciently evident, that we can both
conceive that a thing is possible &
is necessarily, without having a
distinct Idea of the thing itself, of
what it is, or of how it is. The Contrary
of all this however it lay upon you
to demonstrate before you had re-
course to an Assertion, in Support of
w^{ch} you have not produced the least
Shadow of Proof. You cannot here-
fly to Reason & say that it is though
you to call your Eye & Imagination
the ultimate Measure of Extension,
since Reason on all Hands declares
against you. I first proved from Prin-
ciples w^{ch} yourself, as I have already
observed acknowledge not only to be
true, but to be in their own Nature
eternally so, that your Position of in-
divisible Parts of Extension implies
an Impossibility, & of Course that the
Measure from w^{ch} you take it is false
& absurd. I have now shown that

the Idea upon w^{ch} you graft your
measure itself goes upon a Confusion
of distinct & separate Ideas, & is direct-
ly opposite to all the Knowledge we
have of many of our Ideas. Besides
Reason furnishes us with Axioms
w^{ch} instantaneously almost declare
~~your~~ ~~argument~~ against the whole of your
Position. For whatever is absolutely
indivisible can have no parts ^{of any kind}, and
whatever has no parts ^{of any kind}, can be no part of Extension.
Before we have done with this Sub-
ject, I think it may not be amiss
to apply this measure of yours to
increased Extension; & surely you
can have no Objection to the Appli-
cation, since it is the only one you
condescend upon or leave to be applied.
Now since you affirm that no Exten-
sion can be left than what this measure
extends to, & since it is the only measure
you have fixed on, there must likewise
be no Extension greater than what
it takes in. For if it bound one Extreme

it ought certainly to bound likewise the
other. For if it does ^{not}, you must allow
that your measure of Extension is
imperfect & incomplete; & if it does not
hold for one Extreme, how are you sure
that it holds for the other. This supposi-
tion would undoubtedly furnish a
strong Presumption against its doing
so, particularly since you have ad-
vanced Nothing to show that it is
more adapted to the one than the other,
w^{ch} in this Case it was indisputably
your Business to have done. Besides
as the Application of this measure
is the only ground you go upon in
drawing this Conclusion, that it
limits one Extreme, confounding as
I have already shown the Idea of a
thing with the Idea of the Possibility
of the thing or with that of its necessary
Existence you have left yourself no
Bottom to rest upon in drawing any
other Consequence w^{ch} regard to the other
Extreme. What then must be the Re-

result of the Application I propose?
Plainly this; That no Extension
can exist but that w^{ch} the Eye takes
in or reaches. For you must make
the Imagination keep Pace wth the
Eye in your Position for the Reasons
I have mentioned above, if you
want to avoid the Imputation of
Absurdity & Contradiction in mak-
ing it. That I may give you all
Manner of fair Play I shall adopt
your own Expressions. I dare say
you will not maintain them, that
those Images w^{ch} the Eye supplies
us with extend beyond what is
usually called the Heavens, or what
commonly goes by the Name of the
Region of the fixed Stars. No longer
or greater Extension then does or can
possibly exist. A clearer Conclusion
than this cannot possibly be drawn
from your Principle, & I am con-
scious I have done you no sort of
Injustice in drawing it. This Ex-
tension then I suppose you hold to be

infinite; since if you do not, you must
deny the Existence of infinite Extensi-
on. And I do not see how you can well
deny this, after saying that nothing
appears more certain to reason, than
that an infinite Number of those indi-
visible Points you mention, com-
poses an infinite Extension. Whence
then you are necessarily forced into
this Conclusion, ^{either} that the Extent be-
twixt you & what is generally called
the Region of the fixed Stars is infinite,
or that there is no such thing as infinite Extension.
& I shall allow yourself to judge
of the Propriety of it. I have made several
Concessions to you in managing this
Dispute, w^{ch} I was not obliged to do; &
yet after all you see, that every Chain
of Arguments however short & unex-
ceptionable ^{drawn from} raised on your own
Principles leads directly either to an
Absurdity or Contradiction.

• I shall conclude my Examination
of this Matter with taking Notice of one
other Circumstance, w^{ch} tho' it does not
indeed fall immediately under my

Consideration at present, yet as you
make it the Basis of your Objections
to the Existence of Matter in the first
Part of this 12th Essay, I shall briefly con-
sider, & point out some Consequences
flowing from it, w^{ch} strike equally
at your Principles & Dr. Berkeley's, w^{ch}
seem I must own to me, scarcely
different. You affirm in the first part
of your Essay that the mind ^{2nd part} perceives
things external, but that there are
only Images present to it, without
bringing any Proof however in Sup-
port of your Affirmation; & in this
Note you call the Parts of Extension
you speak of as indivisible Images
& say that they are present to the senses
& Sense, that is, to the mind, since it
alone perceives & imagines. These
Images, tho' you deny that they are
divisible or have parts, you allow to
form larger Images w^{ch} have parts.
For you positively declare that an
infinite number of them compose
an infinite Image or infinite Extension

w^{ch} you must of Course acknowledge
contains an infinite Number of parts.
And the number of Parts w^{ch} any I-
mage, ^{yet we call Extension} consists of must likewise be
equal to the Number of those com-
ponent indivisible Images, w^{ch} go
to make it up. Every one of those I-
images then w^{ch} we call parts of Ex-
tension except these indivisible I-
images, must according to your own
Declaration consist of Parts. If then
Images ^{w^{ch} have parts} are present to & in the
Mind as you every where assert,
when you speak of them, you must
certainly confess that the Mind w^{ch}
contains them also consists of Parts,
For if you do not you must affirm
that things w^{ch} have Parts can be
contained in a thing w^{ch} has no
Parts. Now as such Images ac-
cording to your own Principles &
Language may be linear or surface
or solid Extension, the Mind must
possess linear superficial & solid Ex-

extension. Also since every Figure
has Extension, those Images w.
we call Figures must have ex-
tension, & the mind must possess
extended Figurability. Wherefore
it follows from your Principles
that the mind is extended, consists
of Parts, & possesses Figurability con-
sider great Variety of the Capacity
of being figured in a great Variety
of Ways. I do not see how you can
possibly ward off this Blow. But
this is not all, you allow the Ex-
istence of that infinite Image w. you
call infinite Extension, & that it is
made up of an infinite Number
of those indivisible Parts of Extension
or indivisible Images w. you make
mention of. I formerly showed that
according to your Principles there
can be no such thing as infinitelate-
nion, unless you hold the Extent be-
lieve yourself & those Images w. you

called the fixed Stars to be so. Now whe-
ther I take your Principles as laid down
by yourself or keep by this Conclusion, I
can most ^{capitally} obtain this Consequence, if
the mind as containing this Image
consists of an infinite Number of Parts.
And if I confine myself to your own
Principles solely, I can draw this Con-
clusion most unexceptionably, that
the mind is infinitely extended, &
since it contains an infinitely extend-
ed Image. I am not sensible of hav-
ing taken any wide Step in order to
arrive at these Conclusions, nor of
having twisted in the smallest De-
gree your Words & Expressions. For
you expressly call Parts of Extension
Images, & you suppose that these Im-
ages may be combined or increased
by Addition, & consequently that Im-
ages composed of these may be divided
by Division. They must therefore pos-
sess Extension according to all the Ideas

we have of it. The Mind then is ex-
tended & not only extended but extended
infinitely, consists of an infinite Num-
ber of Parts w^{ch} are capable of an endless
Variety of Figureability; that is, it possesses
all those Qualities of what is called Body,
w^{ch} are usually denominated primary.
Besides you allow it to possess all the
secondary Qualities of Body, such as
hard soft, hot, cold, white, black &c. since
following Dr. Berkeley you affirm that
these are Qualities in the Mind not
in the Object. You plainly acknow-
ledge then that the Mind is the Sub-
stratum of all those Qualities w^{ch}
are usually ascribed to matter, or
is that thing in w^{ch} there are organs.
Now what is this but making it
Matter? For all that Mr. Locke meant
or indeed any other Person could reason-
ably mean by Matter was this, that
it is the substratum of the Qualities,
knowing nothing further about it.
But this Conclusion throws new light

upon the Nature of it, since it informs
us that it not only possesses those Quali-
ties w^{ch} mankind generally ascribe
to it, but likewise the Qualities of think-
ing, willing, perceiving &c. Qualities
w^{ch} they formerly very foolishly refer
to something they call Spirit different
from Body or the substratum of those
other Qualities. However we now learn
that Body is the substratum of these
as well as of the other. Your mind
then is Matter w^{ch} thinks, wills & per-
ceives its own Qualities, & not only
is Matter, but is Matter infinitely
extended, & of course fills the Universe.
Also there is nothing but Matter in
the Universe, since those very Quali-
ties by w^{ch} alone we were led to think
there was something different from Body
w^{ch} we called Spirit, are found to have
been unsupplied, & really to belong to
Body. You must therefore either draw
necessarily this Conclusion that your

are Matter & Matter too infinitely ex-
tended, & of course filling the Universe;
capable of having your Parts variously
figured & coloured, ~~some~~ some of them hard,
others soft, some cold, others hot, ~~and~~
you must give up those very Prin-
ciples, w. you had Recourse to in
order to prove that Matter does not
Exist, & by means of w. you seem to
have thought you had accomplished
your Proof. And since you fill the Uni-
verse with Matter, there can no
Matter exist without you, unless
you allege that some of your Parts
are external to other Parts, ^{in the same Places}. Nor
can you possibly hold any other
Matter to exist at all, since if it
does it must exist in yourself, &
two Things of the same kind exist
at the same time in the same Place.
Neither have you the smallest Rea-
son to conclude the Existence of Spirit
or any thing Different from Matter in
the Universe; since those very Quanta

of thinking, ^{by w. alone you could draw the Conclusion} willing, ^{perceiving} &c. are
found to belong to Matter. Thus it ap-
pears then that the Principles you made
Use of to prove that Matter does not exist,
when pushed to their proper Consequences
necessarily leave you in this Conclusion
that nothing else but Matter exists in
the Universe, w. is full of it, & that
you yourself are this infinite Matter
w. fills it.

I now proceed to examine the next part
of your Charge, w. is expressed in the fol-
lowing Words. "Nothing can be more
convincing & satisfactory than all the Con-
clusions concerning the Properties of Cir-
cles & Triangles; & yet when these are once
received, how can we deny, that the Angle
of Contact betwixt a Circle & its Tangent
is infinitely less than any rectilinear
Angle, that as you may increase the Dia-
meter of the Circle in infinitum, this Angle
of Contact becomes still less even in infi-
nitum, & that the Angle of Contact be-

twixt other Curves & their Tangents may
be infinitely less ^{than} those betwixt any Circle
& its Tangent, & so on in infinitum. I
am sorry that I am again under
the Necessity of refusing the Fact.
For I deny that any Mathematician
ever demonstrated that the Angle form'd
by a Circle & its Tangent is infinitely
less than any rectilineal Angle, or even
strictly speaking, that it is less than any
rectilineal Angle, instead of being infi-
nitely less. It is true indeed that Euclid
concludes the Demonstration of the 16.th
Prop. of his third Book with saying ^{that} the An-
gle of a semicircle is greater than any
acute rectilineal Angle, & the remaining
Angle or Angle of Contact less than any
rectilineal Angle. But by this Expression
it is undoubtedly loose & unguarded, tho'
at the same time it falls infinitely short
of your Assertion, he can only be under-
stood to mean, that no straight Line can
be drawn from the Point where a right
line touches a Circle between the tangent
and the Diameter passing thro' the Point of

Contact, so as not to cut the Circumference;
and amounts to the same thing, that how-
ever small an Angle any straight Line
drawn from the Point of Contact makes
with the Tangent, or however great an
acute Angle it makes with the Diameter
passing thro' that Point, some part of the
Circumference will always lie betwixt
this right Line & the Tangent. This is all
that Euclid has demonstrated, & indeed
that he could have demonstrated with re-
gard to this matter. And this is therefore
all that he can be supposed to have meant
by the foregoing Expression. Indeed it is
an Expression w^{ch} has appeared to some
very judicious Geometers, so unguarded
& exceptionable, that they have I think
with a good Deal of Reason looked on that
Part of the Proposition as spurious or adul-
terated. But whether it be Euclid's or not
it must have its Sense & meaning limited
by what he has demonstrated, & there
is not one Word in all his Performances
from Beginning to End, that gives the least
Countenance to this Assertion, that the
Angle of Contact is infinitely less than

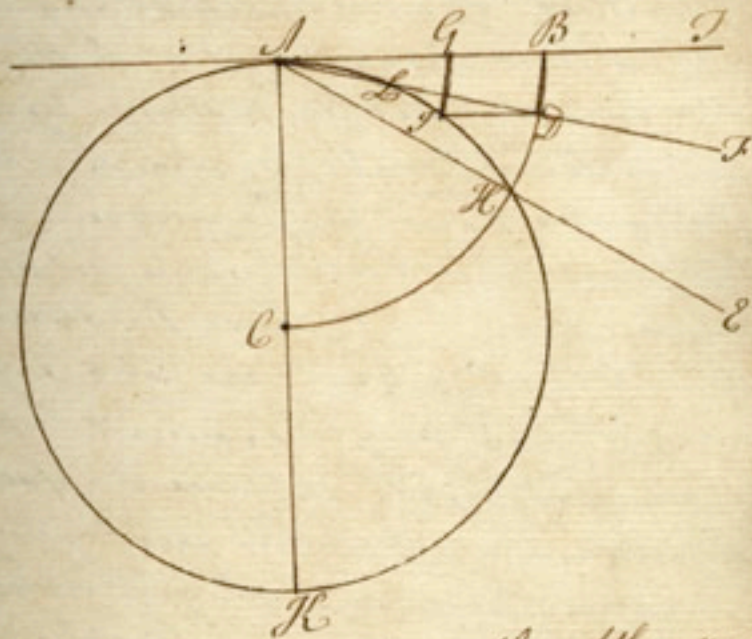
any acclineal Angle. Besides as mix-
tilineal Angles are entirely of a different
Kind from rectilineal ones, & as it were
heterogeneous, he could not with any
Propriety compare them together in
respect of Magnitude, till he had found
out some common Measure of Magni-
tude to w^{ch}. they might both be refer'd.
But from all that Mathematicians
have been yet able to Discover, it does
not appear, that he could from all the
Propositions in his Elements have
investigated such a Standard measure.
But tho' great Improvements have
been made in the exact Sciences in
modern Times, w^{ch}. Euclid knew nothing
of, particularly by Sir Isaac Newton
that Sun beam of the human Race,
yet no such measure has been found.
We know that the Magnitudes of incli-
neal Angles are measured contain-
ed by rightlines of the same Length, are
measured by arcs of a Circle Described
from the common Angular Point as
a Center with one of these Lines as
a Radius, & may be compar'd together

by means of these Arcs. But this mea-
sure is not applicable to mixtilineal Angles;
nor is there any common Measure
known to Mathematicians that can
be equally apply'd to both ^{these} Sorts of Angles.
And it cannot be question'd, that till
some such thing be found out, it is
absurd to compare them together in
respect of Magnitude. Euclid's De-
monstration with regard to the Angle
of Contact, tho' it comprehended the Sub-
stance of what his Principles enabled
him to conclude concerning it, could not
have furnish'd him with the smallest
ground for such a Comparison. That
this Angle properly speaking is less than
any rectilineal Angle is what no man
can prove, since Geometry as far
as is yet known, does not afford Data
for comparing their Magnitudes; &
that it is infinitely less than any rec-
tilineal Angle, is what no Person, who
is in the smallest Degree acquainted wth
the Principles of Geometry, would ever

take in hand or attempt to demonstrate.
 In Proof of what I said in relation to the
 Magnitudes of these two Sorts of Angles,
 that the same measure is not applicable
 to both, take the following illustration.

From any Point C as a Centre with
 any Radius CA describe a Circle AKK ;
 Draw the Diameter ACK , & from one
 of its Extremities A a Tangent AI .
 Also from the Centre C with any or the
 same Radius AC describe an Arc DKE ,
 which is a Quadrant. Through the Point
 K where this Arc meets the Circle AK
 from the Point of Contact A draw a
 right Line AK ; from the same Point
 any other right Line between AK &
 the Tangent AI , will intersect
 the Arc BK in some Point D . Draw
 DI parallel to AK & IG to BD , & through
 the Points G, I let an Arc be described
 with a Radius equal to AB .
 Then it is evident that since the Chords
 BD, GI are equal & parallel, the Arcs
 BD, GI are also equal & parallel. But
 the Magnitude of the Angle EAI is to

the Magnitude of the Angle DAK as the
 Arc BK , to the Arc BD . Now the Arc BK
 subtends the mixtilineal Angle DAK
 at the Distance AB , and ^{the Arc} BD only at the



Distance AG . But neither of these arcs
 has any Title in preference to the other
 to become the Measure of this Angle; &
 as they both cannot, neither of them is.
 In like manner it may be shown
 that no Arc whatever subtending the
 mixtilineal Angle DAK & described at
 any Distance from the Point A can be
 become the Measure of this Angle, so as to

enable us to compare its Magnitude
with that of a rectilinear Angle. An
indefinite Number of Arcs ^{may be} described
at different Distances from the Point
of Contact A; and whether any one
of these Arcs measures it or not, if it
is, has not yet been shown by any
Geometer or Mathematician. Nay
if any one of ^{them} can be the measure of it,
it is plain that there is some rectilinear
Angle equal to it; since however
small the Arc be, there is always
a right-lined Angle so small as to be
measured by it. Whence it appears
that we are not authorized by any
common Measure w^{ch} Geometry of-
fords us for comparing together the
Magnitudes of mixtilineal & right-
lined Angles, to draw this Consequence
that the Angle of Contact between a
Circle & its Tangent is either greater
or less than any right-lined Angle.
And All that we can conclude ^{therefore} with
regard to it is what Euclid himself
has demonstrated, w^{ch} is, that there

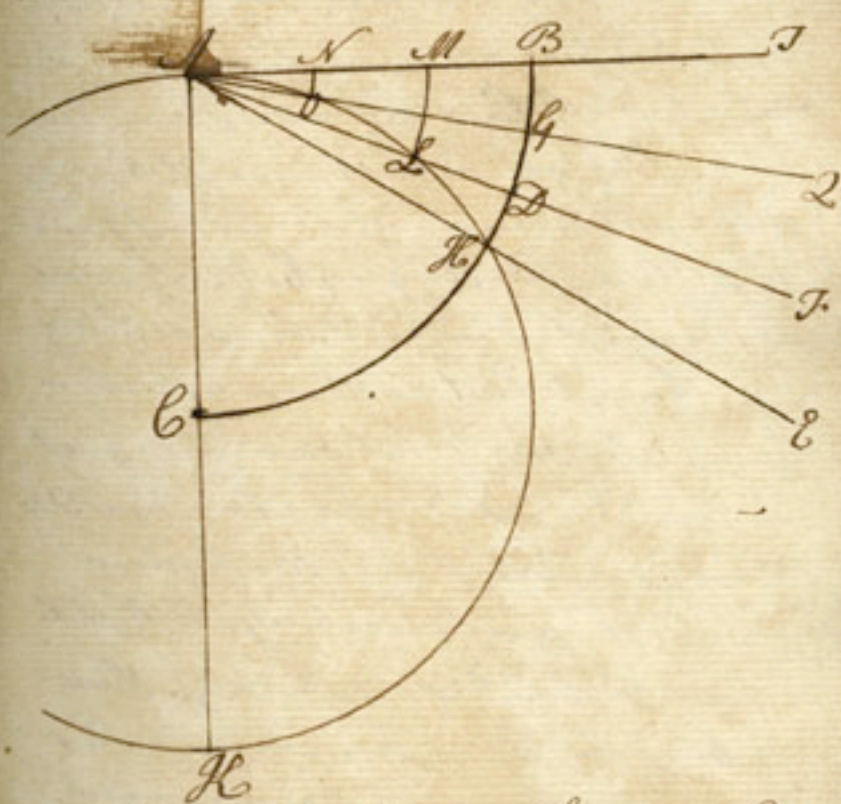
is no rectilinear Angle so small formed
by the Tangent & a right Line drawn
from the Point of Contact on the same
Side of the Tangent with the Curve, as
not to include some Part of the Cir-
cumference intersected or cut off
by the right Line so drawn. And more
than this he has not demonstrated
in Preference to the Angle of Contact.

Much less then have we any ground
to go upon in drawing this Inference
that the said Angle is infinitely less
than any rectilinear Angle, w^{ch} is an
Conclusion, I am persuaded, that
was never attempted to be drawn by
any Geometrician whatever, & w^{ch}
I am ready to show, he never could
have deduced from unexceptionable
geometrical Principles, having al-
ready demonstrated that he has no
Data on w^{ch} he can ground his reasoning.
If you will permit me out any such
Conclusion, I shall undertake to show
it indisputably to be false.

Otherwise

The Magnitudes of the Angles EAT , FAT , LAT , have to one another respectively the Ratios of the Arcs BH , BD , BG . But the Magnitudes of the Angles FAT , LAT , at the Distances AM , AN respectively are measured by the Arcs ML , NO . Now it is evident that the Magnitude of the mixtilinear Angle HAT at the Distances AB , AM , AN &c. from the Point of Contact A be expressed by the Arcs BH , ML , NO &c. joining the several Points of the Tangent with the Circumference AH , it cannot be supposed subject to the same Law of Variation with rectilinear Angles, & of Course be compared with their Magnitudes. For let it be so. Then since BD , BG &c. are fourth Proportionals to AL , AO and ML ; NO , AG & AO &c. the measure of the same mixtilinear Angle HAT at the same Distance AB will be represented by each of the Arcs BH ,

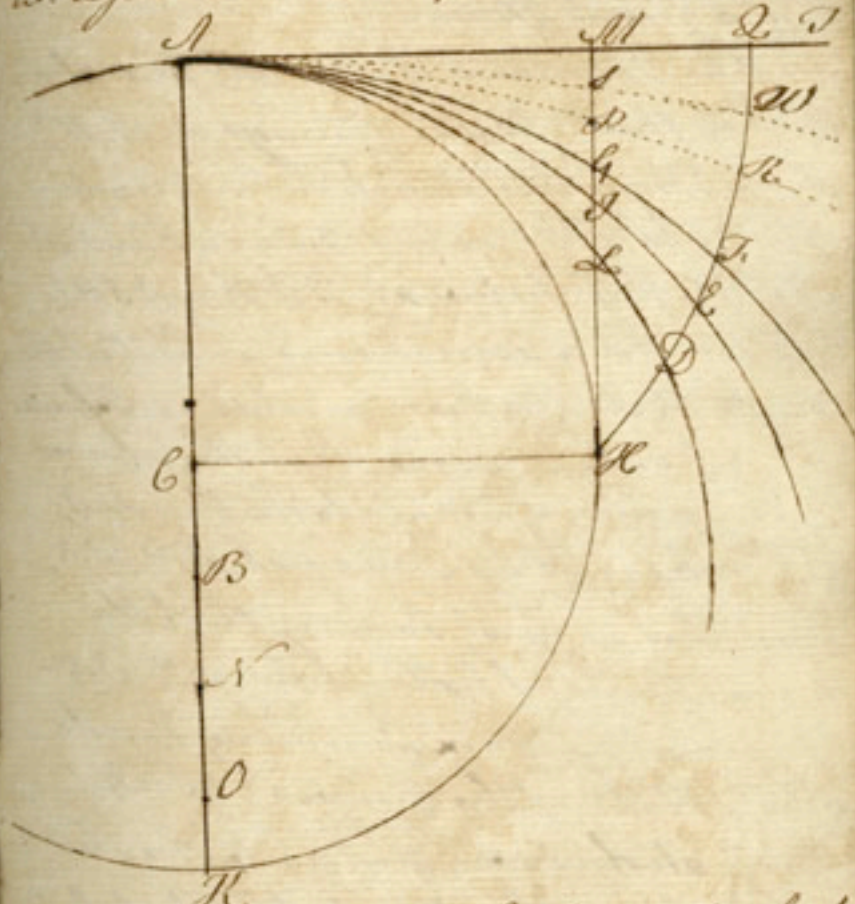
BD , BG &c. w. is absurd. The Arcs BH , BD , BG &c. may ^{be} indefinite in Number.



We would arrive at the same Conclusion, by taking Mr. Potes measure of an Angle, that mixtilinear & right-lined Angles cannot be compared together by any Method yet known.

Let MH touch the Circle AHL , &
 with AH as Radius describe HD . Also
 let there be any Number of Distances
 $CB, BX, X O$ &c. be set off from the
 Centre C on the Circle C produced. Then it is
 plain that all that is meant by any
 Mathematician when he happens
 to say that the Angle HAT of Contact
 is diminished infinitely, is nothing
 more than what is demonstrated in
 Fig. 2. viz. that however great
 the Number of Circles AD, AE, AF ,
 were Described from the Centres
 B, X, O &c. & intersecting MH & HD
 in Points L, I, G &c. D, E, F &c. there
 shall may be Described more Circles
 interlocking them in Points nearer
 to M & D . Now if APR be such a
 Curve that MP is always a right
 Line, P, R will be points to w^{ch} the Inter-
 sections L, I, G &c. D, E, F &c. approach
 nearer & nearer, but however great
 their Number do not reach. And

what is this but saying that HP, HD
 may be divided or intersected indefinitely
 as I have already shown to be possible
 wth regard to all Sorts of Extension.



Now as this will be the Case at what-
 ever Distance the Point H be from the
 Point of Contact A , it is unquestionable
 that nothing can be understood by the
 Expression but this, that any Part of

Extension may be cut indefinitely
so that an indefinite Number of Curves
having the same Tangent may pass
thro' a given Space

In like Manner if $A S W$ be such a
Curve that $M A$ is always as $A M$,
there may an indefinite Number
of Curves of the same Order & kind w^t.
 $A P R$ pass betwixt $A P R$ & $A S W$.
Whence it is sometimes said that the
Angle $R A S$ is diminished indefinitely,
w^t. only means that these Curves
fall nearer & nearer to the Points S ,
 W , when they intersect $S P$, $W R$.
And this is just saying that the
linear Parts of Extension $S P$, $W R$
between the corresponding Points
 S , W ; P , R of the Curves $A S W$,
 $A P R$ at whatever Distance they be
taken from the Point of Contact A ,
may be cut indefinitely. And so we
may proceed on indefinitely. Now
this is perfectly consistent w^t. what I
formerly demonstrated in relation
to the indefinite Diversibility of any Part

of Extension, & shou'd to be agreeable to
every self-evident Maxim or Principle
of Reason. I might extend the same
Observations to Solids generated by
these Curves by supposing $A P R$
to be any Section whatever of a Spher-
ical Sphere thro' its Center, & $A S W$
a right Line drawn in a Tangent-
Plane to the Sphere in the Point A .
But any Person can make the Ap-
plication who is in the least acquaint-
ed with Geometry.

When Mathematicians affirm
one multilinear Angle to be less than
another, they only mean this, that
the Curve forming the one lies
nearer to the Common Tangent at
any certain Distances from the
Point of Contact, than that w^t forms
the other. Thus is the only Way they
have of denoting their Magnitudes.
As they have no common Meas-
ure for them & right lined Angles, & I
am persuaded never will. In Con-
firmation of what I say I might

bring the concurring Testimony of all Geometers & Mathematicians who treat of this Subject. I shall satisfy myself with mentioning the Authority of one of the greatest Mathematicians that the World can boast of, & who, if any Person, was of such a Genius & such Studies, as would have enabled him to find out such a common Measure, w^{ch} however he nowhere takes notice of. And the only Method, w^{ch} he employs, to compare the Magnitudes of multilinear Angles is what I have just now described, as appears from his Scholium to his Doctrine of sines & ultimate Ratios.

Note To suppose one to have an Idea of Infinitude, is to affirm that he has already finished & completed the Process of adding his Ideas of what is finite, w^{ch} is infinite & never can end, w^{ch} is absurd. For it is maintaining that what never can end, is already ended.

Genesis Chapter 4th

In this Chapter there are enumerated 7 Generations from Adam before the Flood in the Line of Cain, w^{ch} stand thus
 Adam, Cain, Enoch, Irad, Methusael, Lamech, and Jabel
 Lamech's Sons by Adah,
 { Jabel }
 { Tubal-cain } his Son & Daughter by Zillah
 { Naamah }

Chapter 5th

In this Chapter there are reckoned 9 Generations from Adam to the Flood in the Line of Seth, w^{ch} follow with the Years from the Creation to the Flood

	Created	Ages
Adam	.....	930
Seth	..... 130 years	912
Enos	..... 105	905
Cainan	..... 90	910
Mahalaleel	..... 70	895

		Ages
Jared	65	962
Enoch	162	365 translated
Methuselah	65	969
Lamech	187	777
Noah	152	950 (Ch. 9. v. 29)

Noah's Age
at the Flood }
Ch. 7. Verse 11.) 600
From the Creation 1656 to the Flood

Chapters 7th & 8th.

From these Chapters it appears that Noah made use of the Sun or solar Year consisting of 360 Days, or of 12 Months of 30 Days each. For Ch. 7. Verse 11. we are told that Noah entered into the Ark on the 17th Day of the 2^d Month, & in Ch. 8. Verse 3^d & 4th that at the End of 150 Days it rested on the Mountains of Ararat on the 17th Day of the 7th Month, that is, at the End of 5 Months, w. at 30 Days

a piece make 150 Days. This year was originally used by all Ancient Nations, that we know any true Account of.

The Anticipation of Infinites or
Method of Indivisibles is only the
Method of Exhaustions made use
by the Ancients a little disguised
& altered.

You declare the "Absurdity of the
Determination of the abstract Sciences
to be ^{still more probable} with regard to Time than Extension"

"An infinite Number of real Parts
of Time, you say, passing in suc-
cession, & exhausted one after an-
other, is so manifest a Contradiction,
that no man, one should think,
whose Judgement is not corrupted
instead of being improved by the Sciences
would ever be able to admit of it."

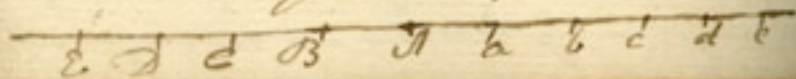
By an infinite Number of real parts
of Time passing in Succession & ex-
hausted one after another, you must
either mean, that after one Part in
the Succession is infinite years over
and, is exhausted another begins to

be exhausted & soon; or that all the
Parts are actually exhausted. If
you mean the first I confess I cannot
discover the Contradiction you
speak of, since it seems to me to sig-
nify nothing more than this, that
Parts of Duration differing from &
succeeding one another propose what
ever coming to an End or Conclu-
sion. But if you mean the second,
I dare say there is no Person capable
of understanding the Terms of the Pro-
position who will not immediately
reject it. For if the Parts can ever
be all exhausted they are not infinite.
And if you understand the Proposi-
tion in this Light, I will venture
to affirm that no Person ever embraced
it, at least I am certain that I never
met with any Mathematician or
Metaphysician that asserted it. At any
Rate I am positive that no one ever
demonstrated it, since it is in itself

demonstratively absurd from the very
Principles of the abstract Sciences,
& that these consequently cannot
be changed with it. As to the second
ever I must acknowledge I do not
discern the Contradiction in the terms
of it; since though the Parts of Dura-
tion are exhausting successively
one after another, yet as their num-
bers is infinite, they never can be
exhausted. An Infinite Number
does not appear to me to be a very
proper Expression. For tho' the Number
in itself is endless or infinite, yet
there is no such thing as an infinite
Number. Thus let a number be ever
so great or what Ratio we from Unity
you will, Unity or other Numbers
may still be added to it without End.
And whatever ^{may} be increased, is
not surely infinite. The Admissibility
of Numbers is endless or infinite &
consequently leaves no room for suppo-

expressing a Number that cannot
 be increased. By adding any partic-
 -ular Measure of time backwards by
 -seconds from the present Instant, by
 finding this Portion of time to be ad-
 -dible to itself without End in the same
 Way with Numbers, we necessarily
 conclude that there is infinite Dura-
 -tion or Eternity, w^{ch} can never be
 filled or equalled by this Increase of
^{time}
~~any measure of time~~ however far
 continued. And this is all that is
 meant by Metaphysicians, when
 they speak of Eternity or infinite Du-
 -ration; & in this I think there is not
 the smallest Contradiction or Absur-
 -dity. I have already observed the
 same thing w^{ch} regard to Extension, a
 Space or Expansion if you choose
 to give it these Names.

Infinite Duration may likewise
 be illustrated by means of linear Extension.



Observation on the Idea of Power
As every one of our Perceptions, either
of external Objects or of our own thoughts
furnishes us with the Idea of Unity,
being that by w. anything is called so;
so every thing w. we consider as pro-
duced, every Change or Alteration, ob-
servable in any thing or Idea, every
Motion of the Body, every Act of the
Mind, gives us the Idea of Power.
Every Person must therefore have the
Idea of Power almost as soon as he
is capable from the Exercise of his
Senses to form a distinct Idea of any thing.
Nor there is scarce any one that does
not very early find a Sort of Necessity be-
hind Productions Changes & Alterations
beginning to be or exist; each of w.
unavoidably affords him the Idea of
Power or of something producing it.
The Idea of any Production of what ever
kind necessarily infers the Idea of Power
since the Mind can not avoid recurring

it, seeing it to be impossible for any
thing produced to produce itself, w:
would be the same thing as supposing
it to be, before it began to be or exist.

This is only however the Idea of the
Existence of Power somewhere, pro-
priety speaking, since ^{w^e} know nothing
about the real Value of any Power.
In like manner we know

M^r. Locke mentions the Idea of Power
Book 2^d. Ch. 7. Sect. 8. Book 2^d. Ch. 21.

Book 2^d. Ch. 23. from Sect. 7th to the End.

I think that M^r. Locke might with
more Propriety have called the Power
w:^h produces any Effect the Cause, than
the Subject in w:^h it inheres or is con-
veyed.

The Idea of every Effect, by w:^h I mean any
thing whatever produced, depending upon
some Power for its Production, w:^h Power
I call the Cause, is different from this

Idea that the same or an equal Power
operating precisely in the same Con-
circumstances would always have pro-
duced, & always will produce the same
or an equal Effect. The first refers to the
necessary Dependence of the one for its
Existence on the other; the last to the
necessary Production of the one in Con-
sequence of ^{the other} a, connected with Time
in general past or present, or to come.

One single Effect informs us as effectually
as ten thousand of the ^{necessary} Existence of some
Power at the time of its Production.

And if this Relation is necessary, it
must have been so, & must always be
so *calenus peribus*.

M^r. Hume does not treat M^r. Locke fully
in saying that he derives the Idea of
Powers in particular Substances, as
the Power w:^h Flame has to produce heat
from reasoning, & then calling it
an original simple Idea. For he
derives such Ideas from Sensation

& in Sect. 7. Chap. 23, Book 2. he ex-
pressly affirms that these Ideas are
actually complex ones, & asks the
Judgment of his Readers for using them
as one original simple Idea en-
tering into the complex ones of
Substances. His Words are.

"Therefore it is that I have reckoned
these Powers amongst the simple
Ideas, which make the complex ones
of the sorts of Substances; though
these Powers considered in themselves
are truly complex Ideas. And in
this looser Sense, I shall leave to be
understood, when I name any of
these Potentialities, among the
simple Ideas, viz. we recollect in our
Minds, when we think of particular
Substances."

And Mr. Locke indeed in this Chapter,
& in the Beginning of Ch. 26. has
said all that Mr. Hume has ad-
vanced concerning the Connexion

betwixt certain Effects, & particular
Substances, imagining that he at
the same time was saying something
new contrary to Mr. Locke's Obser-
vations.

Mr. Locke evidently makes a dis-
tinction betwixt the Idea of the ne-
cessary Dependence of any Effect
upon some Cause, & that of any
particular Effect depending upon
some Power in a certain Substance.

For towards the End of Sect. 2. Ch. 26.
he says that "to have the Idea of
Cause & Effect, it suffices to consider
any simple Idea or Substance, as
beginning to exist by the Operation
of some other, without knowing
the Manner of that Operation."

That is one Instance as well as a
thousand suffices to give us the Idea
of necessary connexion betwixt an
Effect & some Cause.

And in Sect. 1 of the same Chapter
he says that it is by repeated Obser-

...ations we come to connect
strongly particular Effects to certain
Subjects. Thus says he finding
that in that Substance w^{ch} we call
Wax, Fluidity, w^{ch} is a simple Idea,
"that was not in it before, is con-
stantly produced by the Application
of a certain Degree of heat, we call
"the simple Idea of heat in Relation
"to fluidity in Wax the Cause of it,
"fluidity, the Effect; & so on"

Definitions

Cause is that Power by w^{ch} any
thing of whatever kind or nature
Substance motion, thought, Change &c.
is produced or begins to be or exist
And the thing so produced is called
the Effect.