

## 8 Leibniz and Clarke

### READING

#### *The Leibniz-Clarke Correspondence*

##### **Mr. Leibniz's First Paper**

1. Natural religion itself, seems to decay (in England) very much. Many will have human souls to be material: others make God himself a corporeal being.
2. Mr. Locke, and his followers, are uncertain at least, whether the soul be not material, and naturally perishable.
3. Sir Isaac Newton says, that space is an organ, which God makes use of to perceive things by. But if God stands in need of any organ to perceive things by, it will follow, that they do not depend altogether upon him, nor were produced by him.
4. Sir Isaac Newton, and his followers, have also a very odd opinion concerning the work of God. According to their doctrine, God Almighty wants to wind up his watch from time to time: otherwise it would cease to move. He had not, it seems, sufficient foresight to make it a perpetual motion. Nay, the machine of God's making, is so imperfect, according to these gentlemen; that he is obliged to clean it now and then by an extraordinary concourse, and even to mend it, as a clockmaker mends his work; who must consequently be so much the more unskilful a workman, as he is oftener obliged to mend his work and to set it right. According to my opinion, the same force and vigour remains always in the world, and only passes from one part of matter to another, agreeably to the laws of nature, and the beautiful pre-established order. And I hold, that when God works miracles, he does not do it in order to supply the wants of nature, but those of grace. Whoever thinks otherwise, must needs have a very mean notion of the wisdom and power of God.

##### **Dr. Clarke's First Reply**

1. That there are some in England, as well as in other countries, who deny or very much corrupt even natural religion itself, is very true, and much to be lamented. But (next to the vicious affections of men) this is to be principally ascribed to the false philosophy of the materialists, to which the mathematical principles of philosophy

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are the most directly repugnant. That some make the souls of men, and others even God himself to be a corporeal being; is also very true: but those who do so, are the great enemies of the mathematical principles of philosophy; which principles, and which alone, prove matter, or body, to be the smallest and most inconsiderable part of the universe.

2. That Mr. Locke doubted whether the soul was immaterial or no, may justly be suspected from some parts of his writings: but herein he has been followed only by some materialists, enemies to the mathematical principles of philosophy; and who approve little or nothing in Mr. Locke's writings, but his errors.

3. Sir Isaac Newton doth not say, that space is the organ which God makes use of to perceive things by; nor that he has need of any medium at all, whereby to perceive things: but on the contrary, that he, being omnipresent, perceives all things by his immediate presence to them, in all space wherever they are, without the intervention or assistance of any organ or medium whatsoever. In order to make this more intelligible, he illustrates it by a similitude: that as the mind of man, by its immediate presence to the pictures or images of things, form'd in the brain by the means of the organs of sensation, sees those pictures as if they were the things themselves; so God sees all things, by his immediate presence to them; he being actually present to the things themselves, to all things in the universe; as the mind of man is present to all the pictures of things formed in his brain. Sir Isaac Newton considers the brain and organs of sensation, as the means by which those pictures are formed: but not as the means by which the mind sees or perceives those pictures, when they are so formed. And in the universe, he doth not consider things as if they were pictures, formed by certain means, or organs; but as real things, form'd by God himself, and seen by him in all places wherever they are, without the intervention of any medium at all. And this similitude is all that he means, when he supposes infinite space to be (as it were) the *sensorium* of the Omnipresent Being.\*...

#### **Mr. Leibniz's Second Paper**

1. It is rightly observed in the paper delivered to the Princess of Wales, which Her Royal Highness has been pleased to communicate to me, that, next to corruption of manners, the principles of the materialists do very much contribute to keep up impiety. But I believe the author had no reason to add, that the mathematical principles of philosophy are opposite to those of the materialists. On the contrary, they are

\* See Newton's *Optics*, Query 28.

the same; only with this difference, that the materialists, in imitation of Democritus, Epicurus, and Hobbes, confine themselves altogether to mathematical principles, and admit only bodies; whereas the Christian mathematicians admit also immaterial substances. Wherefore, not mathematical principles (according to the usual sense of that word) but metaphysical principles ought to be opposed to those of the materialists. Pythagoras, Plato, and Aristotle in some measure, had a knowledge of these principles; but I pretend to have established them demonstratively in my *Theodicy*, though I have done it in a popular manner. The great foundation of mathematics is the principle of contradiction, or identity, that is, that a proposition cannot be true and false at the same time; and that therefore A is A, and cannot be not A. This single principle is sufficient to demonstrate every part of arithmetic and geometry, that is, all mathematical principles. But in order to proceed from mathematics to natural philosophy, another principle is requisite, as I have observed in my *Theodicy*: I mean, the principle of a sufficient reason, viz. that nothing happens without a reason why it should be so, rather than otherwise. And therefore Archimedes being to proceed from mathematics to natural philosophy, in his book *De Æquilibrio*, was obliged to make use of a particular case of the great principle of a sufficient reason. He takes it for granted, that if there be a balance, in which everything is alike on both sides, and if equal weights are hung on the two ends of that balance, the whole will be at rest. 'Tis because no reason can be given, why one side should weigh down, rather than the other. Now, by that single principle, viz. that there ought to be a sufficient reason why things should be so, and not otherwise, one may demonstrate the being of a God, and all the other parts of metaphysics or natural theology; and even, in some measure, those principles of natural philosophy, that are independent upon mathematics: I mean, the dynamical principles, or the principles of force. . . .

#### Dr. Clarke's Second Reply

1. When I said that the mathematical principles of philosophy are opposite to those of the materialists; the meaning was, that whereas materialists suppose the frame of nature to be such as could have arisen from mere mechanical principles of matter and motion, of necessity and fate; the mathematical principles of philosophy show on the contrary, that the state of things (the constitution of the sun and planets) is such as could not arise from any thing but an intelligent and free cause. As to the propriety of the name; so far as metaphysical consequences follow demonstratively from mathematical principles, so far the mathematical principles may (if it be thought fit) be called metaphysical principles.

'Tis very true, that nothing is, without a sufficient reason why it is, and why it is thus rather than otherwise. And therefore, where there is no cause, there can be no effect. But this sufficient reason is oft-times no other, than the mere will of God. For instance: why this particular system of matter, should be created in one particular place, and that in another particular place; when, (all place being absolutely indifferent to all matter,) it would have been exactly the same thing *vice versa*, supposing the two systems (or the particles) of matter to be alike; there can be no other reason, but the mere will of God. Which if it could in no case act without a predetermining cause, any more than a balance can move without a preponderating weight; this would tend to take away all power of choosing, and to introduce fatality....

### Mr. Leibniz's Third Paper

1. According to the usual way of speaking, mathematical principles concern only mere mathematics, viz. numbers, figures, arithmetic, geometry. But metaphysical principles concern more general notions, such as are cause and effect.
2. The author grants me this important principle; that nothing happens without a sufficient reason, why it should be so, rather than otherwise. But he grants it only in words, and in reality denies it. Which shows that he does not fully perceive the strength of it. And therefore he makes use of an instance, which exactly falls in with one of my demonstrations against real absolute space, which is an idol of some modern Englishmen. I call it an idol, not in a theological sense, but in a philosophical one; as Chancellor Bacon says, that there are *idola tribus*, *idola specus*.
3. These gentlemen maintain therefore, that space is a real absolute being. But this involves them in great difficulties; for such a being must needs be eternal and infinite. Hence some have believed it to be God himself, or, one of his attributes, his immensity. But since space consists of parts, it is not a thing which can belong to God.
4. As for my own opinion, I have said more than once, that I hold space to be something merely relative, as time is; that I hold it to be an order of coexistences, as time is an order of successions. For space denotes, in terms of possibility, an order of things which exist at the same time, considered as existing together; without enquiring into their manner of existing. And when many things are seen together, one perceives that order of things among themselves.
5. I have many demonstrations, to confute the fancy of those who take space to be a substance, or at least an absolute being. But I shall only use, at the present, one demonstration, which the author here gives me occasion to insist upon. I say then,

that if space was an absolute being, there would something happen for which it would be impossible there should be a sufficient reason. Which is against my axiom. And I prove it thus. Space is something absolutely uniform; and, without the things placed in it, one point of space does not absolutely differ in any respect whatsoever from another point of space. Now from hence it follows, (supposing space to be something in itself, besides the order of bodies among themselves,) that 'tis impossible there should be a reason, why God, preserving the same situations of bodies among themselves, should have placed them in space after one certain particular manner, and not otherwise; why every thing was not placed the quite contrary way, for instance, by changing East into West. But if space is nothing else, but that order or relation; and is nothing at all without bodies, but the possibility of placing them; then those two states, the one such as it now is, the other supposed to be the quite contrary way, would not at all differ from one another. Their difference therefore is only to be found in our chimerical supposition of the reality of space in itself. But in truth the one would exactly be the same thing as the other, they being absolutely indiscernible; and consequently there is no room to enquire after a reason of the preference of the one to the other. . . .

7. It appears from what I have said, that my axiom has not been well understood; and that the author denies it, tho' he seems to grant it. 'Tis true, says he, that there is nothing without a sufficient reason why it is, and why it is thus, rather than otherwise: but he adds, that this sufficient reason, is often the simple or mere will of God: as, when it is asked why matter was not placed elsewhere in space; the same situations of bodies among themselves being preserved. But this is plainly maintaining, that God wills something, without any sufficient reason for his will: against the axiom, or the general rule of whatever happens. This is falling back into the loose indifference, which I have confuted at large, and showed to be absolutely chimerical even in creatures, and contrary to the wisdom of God, as if he could operate without acting by reason. . . .

### **Dr. Clarke's Third Reply**

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2. Undoubtedly nothing is, without a sufficient reason why it is, rather than not; and why it is thus, rather than otherwise. But in things in their own nature indifferent; mere will, without any thing external to influence it, is alone that sufficient reason. As in the instance of God's creating or placing any particle of matter in one place rather than in another, when all places are originally alike. And the case is the same,

- even though space were nothing real, but only the mere order of bodies: for still it would be absolutely indifferent, and there could be no other reason but mere will, why three equal particles should be placed or ranged in the order *a, b, c*, rather than in the contrary order. And therefore no argument can be drawn from this indifference of all places, to prove that no space is real. For different spaces are really different or distinct one from another, though they be perfectly alike. And there is this evident absurdity in supposing space not to be real, but to be merely the order of bodies; that, according to that notion, if the earth and sun and moon had been placed where the remotest fixed stars now are, (provided they were placed in the same order and distance they now are with regard one to another,) it would not only have been, (as this learned author rightly says,) *la même chose*, the same thing in effect; which is very true: but it would also follow, that they would then have been in the same place too, as they are now: which is an express contradiction.

The ancients<sup>a</sup> did not call all space which is void of bodies, but only extramundane space, by the name of imaginary space. The meaning of which, is not, that such space is not real;<sup>b</sup> but only that we are wholly ignorant what kinds of things are in that space. Those writers, who by the word, *imaginary*, meant at any time to affirm that space was not real; did not thereby prove, that it was not real.

3. Space is not a being, an eternal and infinite being, but a property, or a consequence of the existence of a being infinite and eternal. Infinite space, is immensity: but immensity is not God: and therefore infinite space, is not God. Nor is there any difficulty in what is here alleged about space having parts. For infinite space is one, absolutely and essentially indivisible: and to suppose it parted, is a contradiction in terms; because there must be space in the partition itself; which is to suppose it parted, and yet not parted at the same time. The immensity or omnipresence of God, is no more a dividing of his substance into parts; than his duration, or continuance of existing, is a dividing of his existence into parts. There is no difficulty here, but what arises from the figurative abuse of the word, *parts*.

4. If space was nothing but the order of things coexisting; it would follow, that if God should remove in a straight line the whole material world entire, with any swiftness whatsoever; yet it would still always continue in the same place: and that nothing would receive any shock upon the most sudden stopping of that motion. And if time was nothing but the order of succession of created things; it would follow, that if God had created the world millions of ages sooner than he did, yet it

a. This was occasioned by a passage in the private letter wherein Mr. Leibniz's third paper came inclosed.

b. Of nothing, there are no dimensions, no magnitudes, no quantity, no properties.

would not have been created at all the sooner. Further: space and time are quantities; which situation and order are not.

5. The argument in this paragraph, is; that because space is uniform or alike, and one part does not differ from another; therefore the bodies created in one place, if they had been created in another place, (supposing them to keep the same situation with regard to each other,) would still have been created in the same place as before: which is a manifest contradiction. The uniformity of space, does indeed prove, that there could be no (external) reason why God should create things in one place rather than in another: but does that hinder his own will, from being to itself a sufficient reason of acting in any place, when all places are indifferent or alike, and there be good reason to act in some place? . . .

7 and 8. Where there is any difference in the nature of things, there the consideration of that difference always determines an intelligent and perfectly wise agent. But when two ways of acting are equally and alike good, (as in the instances before mentioned;) to affirm in such case, that God cannot act at all, or that 'tis no perfection in him to be able to act, because he can have no external reason to move him to act one way rather than the other, seems to be denying God to have in himself any original principle or power of beginning to act, but that he must needs (as it were mechanically) be always determined by things extrinsic. . . .

#### **Mr. Leibniz's Fourth Paper**

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3. 'Tis a thing indifferent, to place three bodies, equal and perfectly alike, in any order whatsoever; and consequently they will never be placed in any order, by him who does nothing without wisdom. But then he being the author of things, no such things will be produced by him at all; and consequently there are no such things in nature.

4. There is no such thing as two individuals indiscernible from each other. An ingenious gentleman of my acquaintance, discoursing with me, in the presence of Her Electoral Highness the Princess Sophia, in the garden of Herrenhausen; thought he could find two leaves perfectly alike. The Princess defied him to do it, and he ran all over the garden a long time to look for some; but it was to no purpose. Two drops of water, or milk, viewed with a microscope, will appear distinguishable from each other. This is an argument against atoms; which are confuted, as well as a vacuum, by the principles of true metaphysics.

5. Those great principles of a *sufficient reason*, and of the *identity of indiscernibles*, change the state of metaphysics. That science becomes real and demonstrative by means of these principles; whereas before, it did generally consist in empty words.

6. To suppose two things indiscernible, is to suppose the same thing under two names. And therefore to suppose that the universe could have had at first another position of time and place, than that which it actually had; and yet that all the parts of the universe should have had the same situation among themselves, as that which they actually had; such a supposition, I say, is an impossible fiction.

7. The same reason, which shows that extramundane space is imaginary, proves that all empty space is an imaginary thing; for they differ only as greater and less.

8. If space is a property or attribute, it must be the property of some substance. But what substance will that bounded empty space be an affection or property of, which the persons I am arguing with, suppose to be between two bodies?

9. If infinite space is immensity, finite space will be the opposite to immensity, that is, 'twill be mensurability, or limited extension. Now extension must be the affection of some thing extended. But if that space be empty, it will be an attribute without a subject, an extension without any thing extended. Wherefore by making space a property, the author falls in with my opinion, which makes it an order of things, and not any thing absolute.

10. If space is an absolute reality; far from being a property or an accident opposed to substance, it will have a greater reality than substances themselves. God cannot destroy it, nor even change it in any respect. It will be not only immense in the whole, but also immutable and eternal in every part. There will be an infinite number of eternal things besides God.

11. To say that infinite space has no parts, is to say that it does not consist of finite spaces; and that infinite space might subsist, though all finite spaces should be reduced to nothing. It would be, as if one should say, in the Cartesian supposition of a material extended unlimited world, that such a world might subsist, though all the bodies of which it consists, should be reduced to nothing. . . .

13. To say that God can cause the whole universe to move forward in a right line, or in any other line, without making otherwise any alteration in it; is another chimerical supposition. For, two states indiscernible from each other, are the same state; and consequently, 'tis a change without any change. Besides, there is neither rhyme nor reason in it. But God does nothing without reason; and 'tis impossible there should be any here. Besides, it would be *agendo nihil agere*, as I have just now said, because of the indiscernibility.



14. These are *idola tribus*, mere chimeras, and superficial imaginations. All this is only grounded upon the supposition, that imaginary space is real. . . .

16. If space and time were any thing absolute, that is, if they were any thing else, besides certain orders of things; then indeed my assertion would be a contradiction. But since it is not so, the hypothesis [that space and time are any thing absolute] is contradictory, that is, 'tis an impossible fiction.

17. And the case is the same as in geometry; where by the very supposition that a figure is greater than it really is, we sometimes prove that it is not greater. This indeed is a contradiction; but it lies in the hypothesis, which appears to be false for that very reason.

18. Space being uniform, there can be neither any external nor internal reason, by which to distinguish its parts, and to make any choice among them. For, any external reason to discern between them, can only be grounded upon some internal one. Otherwise we should discern what is indiscernible, or choose without discerning. A will without reason, would be the chance of the Epicureans. A God, who should act by such a will, would be a God only in name. The cause of these errors proceeds from want of care to avoid what derogates from the divine perfections.

19. When two things which cannot both be together, are equally good; and neither in themselves, nor by their combination with other things, has the one any advantage over the other; God will produce neither of them.

20. God is never determined by external things, but always by what is in himself; that is, by his knowledge of things, before any thing exists without himself. . . .

41. The author contends, that space does not depend upon the situation of bodies. I answer: 'tis true, it does not depend upon such or such a situation of bodies; but it is that order, which renders bodies capable of being situated, and by which they have a situation among themselves when they exist together; as time is that order, with respect to their successive position. But if there were no creatures, space and time would be only in the ideas of God. . . .

#### Dr. Clarke's Fourth Reply

1 and 2. This notion leads to universal necessity and fate, by supposing that motives have the same relation to the will of an intelligent agent, as weights have to a balance;<sup>a</sup> so that of two things absolutely indifferent, an intelligent agent can no more choose

a. See above, Mr. Leibniz's Second Paper, §1.

either, than a balance can move itself when the weights on both sides are equal. But the difference lies here. A balance is no agent, but is merely passive and acted upon by the weights; so that, when the weights are equal, there is nothing to move it. But intelligent beings are agents; not passive, in being moved by the motives, as a balance is by weights; but they have active powers and do move themselves, sometimes upon the view of strong motives, sometimes upon weak ones, and sometimes where things are absolutely indifferent. In which latter case, there may be very good reason to act, though two or more ways of acting may be absolutely indifferent. This learned writer always supposes the contrary, as a principle; but gives no proof of it, either from the nature of things, or the perfections of God.

3 and 4. This argument, if it was true, would prove that God neither has created, nor can possibly create any matter at all. For the perfectly solid parts of all matter, if you take them of equal figure and dimensions (which is always possible in supposition,) are exactly alike; and therefore it would be perfectly indifferent if they were transposed in place; and consequently it was impossible (according to this learned author's argument,) for God to place them in those places wherein he did actually place them at the creation, because he might as easily have transposed their situation. 'Tis very true, that no two leaves, and perhaps no two drops of water are exactly alike; because they are bodies very much compounded. But the case is very different in the parts of simple solid matter. And even in compounds, there is no impossibility for God to make two drops of water exactly alike. And if he should make them exactly alike, yet they would never the more become one and the same drop of water, because they were alike. Nor would the place of the one, be the place of the other; though it was absolutely indifferent, which was placed in which place. The same reasoning holds likewise concerning the original determination of motion, this way or the contrary way.

5 and 6. Two things, by being exactly alike, do not cease to be two. The parts of time, are as exactly like to each other, as those of space: yet two points of time, are not the same point of time, nor are they two names of only the same point of time. Had God created the world but this moment, it would not have been created at the time it was created. And if God has made (or can make) matter finite in dimensions, the material universe must consequently be in its nature moveable; for nothing that is finite, is immoveable. To say therefore that God could not have altered the time or place of the existence of matter, is making matter to be necessarily infinite and eternal, and reducing all things to necessity and fate.

7. Extra-mundane space, (if the material world be finite in its dimensions,) is not imaginary, but real. Nor are void spaces in the world, merely imaginary. In an

exhausted receiver,<sup>a</sup> though rays of light, and perhaps some other matter, be there in an exceeding small quantity; yet the want of resistance plainly shows, that the greatest part of that space is void of matter. For subtleness or fineness of matter, cannot be the cause of want of resistance. Quicksilver is as subtle, and consists of as fine parts and as fluid, as water; and yet makes more than ten times the resistance: which resistance arises therefore from the quantity, and not from the grossness of the matter.

8. Space void of body, is the property of an incorporeal substance. Space is not bounded by bodies, but exists equally within and without bodies. Space is not inclosed between bodies; but bodies, existing in unbounded space, are, themselves only, terminated by their own dimensions.

9. Void space, is not an attribute without a subject; because, by void space, we never mean space void of every thing, but void of body only. In all void space, God is certainly present, and possibly many other substances which are not matter; being neither tangible, nor objects of any of our senses.

10. Space is not a substance, but a property; and if it be a property of that which is necessary, it will consequently (as all other properties of that which is necessary must do,) exist more necessarily, (though it be not itself a substance,) than those substances themselves which are not necessary. Space is immense, and immutable, and eternal; and so also is duration. Yet it does not at all from hence follow, that any thing is eternal *hors de Dieu*. For space and duration are not *hors de Dieu*, but are caused by, and are immediate and necessary consequences of his existence. And without them, his eternity and ubiquity (or omnipresence) would be taken away.

11 and 12. Infinites are composed of finites, in no other sense, than as finites are composed of infinitesimals. In what sense space has or has not parts, has been explained before, Reply III, §3. Parts, in the corporeal sense of the word, are separable, compounded, ununited, independent on, and moveable from, each other: but infinite space, though it may by us be partially apprehended, that is, may in our imagination be conceived as composed of parts; yet those parts (improperly so called) being essentially indiscernible and immoveable from each other, and not partable without an express contradiction in terms, (see above, Reply II, §4 and Reply III, §3;) space consequently is in itself essentially one, and absolutely indivisible.

13. If the world be finite in dimensions, it is moveable by the power of God and therefore my argument drawn from that moveableness is conclusive. Two places,

a. This was occasioned by a passage in the private letter wherein Mr. Leibniz's paper came inclosed.

though exactly alike, are not the same place. Nor is the motion or rest of the universe, the same state; any more than the motion or rest of a ship, is the same state, because a man shut up in the cabin cannot perceive whether the ship sails or not, so long as it moves uniformly. The motion of the ship, though the man perceives it not, is a real different state, and has real different effects; and, upon a sudden stop, it would have other real effects; and so likewise would an indiscernible motion of the universe. To this argument, no answer has ever been given. It is largely insisted on by Sir Isaac Newton in his *Mathematical Principles*, (Definit. 8.) where, from the consideration of the properties, causes, and effects of motion, he shows the difference between real motion, or a body's being carried from one part of space to another; and relative motion, which is merely a change of the order or situation of bodies with respect to each other. This argument is a mathematical one; showing, from real effects, that there may be real motion where there is none relative; and relative motion, where there is none real: and is not to be answered, by barely asserting the contrary.

14. The reality of space is not a supposition, but is proved by the foregoing arguments, to which no answer has been given. Nor is any answer given to that other argument, that space and time are quantities, which situation and order are not. . . .

#### Mr. Leibniz's Fifth Paper

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 29. I have demonstrated, that space is nothing else but an order of the existence of things, observed as existing together; and therefore the fiction of a material finite universe, moving forward in an infinite empty space, cannot be admitted. It is altogether unreasonable and impracticable. For, besides that there is no real space out of the material universe; such an action would be without any design in it: it would be working without doing any thing, *agendo nihil agere*. There would happen no change, which could be observed by any person whatsoever. These are imaginations of philosophers who have incomplete notions, who make space an absolute reality. Mere mathematicians, who are only taken up with the conceits of imagination, are apt to forge such notions; but they are destroyed by superior reasons.

30. Absolutely speaking, it appears that God can make the material universe finite in extension; but the contrary appears more agreeable to his wisdom.

31. I don't grant, that every finite is moveable. According to the hypothesis of my adversaries themselves, a part of space, though finite, is not moveable. What is moveable, must be capable of changing its situation with respect to something else,

and to be in a new state discernible from the first: otherwise the change is but a fiction. A moveable finite, must therefore make part of another finite, that any change may happen which can be observed. . . .

47. I will here show, how men come to form to themselves the notion of space. They consider that many things exist at once and they observe in them a certain order of co-existence, according to which the relation of one thing to another is more or less simple. This order, is their *situation* or distance. When it happens that one of those co-existent things changes its relation to a multitude of others, which do not change their relation among themselves; and that another thing, newly come, acquires the same relation to the others, as the former had; we then say, it is come into the place of the former; and this change, we call a motion in that body, wherein is the immediate cause of the change. And though many, or even all the co-existent things, should change according to certain known rules of direction and swiftness; yet one may always determine the relation of situation, which every co-existent acquires with respect to every other co-existent; and even that relation which any other co-existent would have to this, or which this would have to any other, if it had not changed, or if it had changed any otherwise. And supposing, or feigning, that among those co-existents, there is a sufficient number of them, which have undergone no change; then we may say, that those which have such a relation to those fixed existents, as others had to them before, have now the *same place* which those others had. And that which comprehends all those places, is called *space*. Which shows, that in order to have an idea of place, and consequently of space, it is sufficient to consider these relations, and the rules of their changes, without needing to fancy any absolute reality out of the things whose situation we consider. And, to give a kind of a definition: *place* is that, which we say is the same to A and, to B, when the relation of the co-existence of B, with C, E, F, G, etc. agrees perfectly with the relation of the co-existence, which A had with the same C, E, F, G, etc. supposing there has been no cause of change in C, E, F, G, etc. It may be said also, without entering into any further particularity, that *place* is that, which is the same in different moments to different existent things, when their relations of co-existence with certain other existents, which are supposed to continue fixed from one of those moments to the other, agree entirely together. And *fixed existents* are those, in which there has been no cause of any change of the order of their co-existence with others; or (which is the same thing,) in which there has been no motion. Lastly, *space* is that, which results from places taken together. And here it may not be amiss to consider the difference between place, and the relation of situation, which is in the body that fills up the place. For, the place of A and B, is the same; whereas the relation of A to fixed

bodies, is not precisely and individually the same, as the relation which B (that comes into its place) will have to the same fixed bodies; but these relations agree only. For, two different subjects, as A and B, cannot have precisely the same individual affection; it being impossible, that the same individual accident should be in two subjects, or pass from one subject to another. But the mind not contented with an agreement, looks for an identity, for something that should be truly the same; and conceives it as being extrinsic to the subjects: and this is what we call *place* and *space*. But this can only be an ideal thing; containing a certain order, wherein the mind conceives the application of relations. In like manner, as the mind can fancy to itself an order made up of genealogical lines, whose bigness would consist only in the number of generations, wherein every person would have his place; and if to this one should add the fiction of a *metempsychosis*, and bring in the same human souls again; the persons in those lines might change place; he who was a father, or a grandfather, might become a son, or a grandson, etc. And yet those genealogical places, lines, and spaces, though they should express real truth, would only be ideal things. I shall allege another example, to show how the mind uses, upon occasion of accidents which are in subjects, to fancy to itself something answerable to those accidents, out of the subjects. The ratio or proportion between two lines L and M, may be conceived three several ways; as a ratio of the greater L, to the lesser M; as a ratio of the lesser M, to the greater L; and lastly, as something abstracted from both, that is, as the ratio between L and M, without considering which is the antecedent, or which the consequent; which the subject, and which the object. And thus it is, that proportions are considered in music. In the first way of considering them, L the greater; in the second, M the lesser, is the subject of that accident, which philosophers call relation. But, which of them will be the subject, in the third way of considering them? It cannot be said that both of them, L and M together, are the subject of such an accident; for if so, we should have an accident in two subjects, with one leg in one, and the other in the other; which is contrary to the notion of accidents. Therefore we must say, that this relation, in this third way of considering it, is indeed out of the subjects; but being neither a substance, nor an accident, it must be a mere ideal thing, the consideration of which is nevertheless useful. To conclude: I have here done much like Euclid, who not being able to make his readers well understand what *ratio* is absolutely in the sense of geometricians; defines what are the *same ratios*. Thus, in like manner, in order to explain what *place* is, I have been content to define what is the *same place*. Lastly; I observe, that the traces of moveable bodies, which they leave sometimes upon the immoveable ones on which they are moved; have given men occasion to form in their imagination such an idea, as if

some trace did still remain, even when there is nothing unmoved. But this is a mere ideal thing, and imports only, that if there was any unmoved thing there, the trace might be marked out upon it. And 'tis this analogy, which makes men fancy places, traces and spaces; though those things consist only in the truth of relations, and not at all in any absolute reality.

48. To conclude. If the space (which the author fancies) void of all bodies, is not altogether empty; what is it then full of? Is it full of extended spirits perhaps, or immaterial substances, capable of extending and contracting themselves; which move therein, and penetrate each other without any inconveniency, as the shadows of two bodies penetrate one another upon the surface of a wall? Methinks I see the revival of the odd imaginations of Dr. Henry More (otherwise a learned and well-meaning man,) and of some others who fancied that those spirits can make themselves impenetrable whenever they please. Nay, some have fancied, that man, in the state of innocency, had also the gift of penetration; and that he became solid, opaque, and impenetrable by his fall. Is it not overthrowing our notions of things, to make God have parts, to make spirits have extension? The principle of the want of a sufficient reason does alone drive away all these spectres of imagination. Men easily run into fictions, for want of making a right use of that great principle. . . .

52. In order to prove that space, without bodies, is an absolute reality; the author objected, that a finite material universe might move forward in space. I answered, it does not appear reasonable that the material universe should be finite; and, though we should suppose it to be finite; yet 'tis unreasonable it should have motion any otherwise, than as its parts change their situation among themselves; because such a motion would produce no change that could be observed, and would be without design. 'Tis another thing, when its parts change their situation among themselves; for then there is a motion in space; but it consists in the order of relations which are changed. The author replies now, that the reality of motion does not depend upon being observed; and that a ship may go forward, and yet a man, who is in the ship, may not perceive it. I answer, motion does not indeed depend upon being observed; but it does depend upon being possible to be observed. There is no motion, when there is no change that can be observed. And when there is no change that can be observed, there is no change at all. The contrary opinion is grounded upon the supposition of a real absolute space, which I have demonstratively confuted by the principle of the want of a sufficient reason of things. ✓

53. I find nothing in the Eighth Definition of the *Mathematical Principles of Nature*, nor in the Scholium belonging to it, that proves, or can prove, the reality of space

in itself. However, I grant there is a difference between an absolute true motion of a body, and a mere relative change of its situation with respect to another body. For when the immediate cause of the change is in the body, that body is truly in motion; and then the situation of other bodies, with respect to it, will be changed consequently, though the cause of that change be not in them. 'Tis true that, exactly speaking, there is not any one body, that is perfectly and entirely at rest; but we frame an abstract notion of rest, by considering the thing mathematically. Thus have I left nothing unanswered, of what has been alleged for the absolute reality of space. And I have demonstrated the falsehood of that reality, by a fundamental principle, one of the most certain both in reason and experience; against which, no exception or instance can be alleged. Upon the whole, one may judge from what has been said that I ought not to admit a moveable universe; nor any place out of the material universe....

62. I don't say that matter and space are the same thing. I only say, there is no space, where there is no matter; and that space in itself is not an absolute reality. Space and matter differ, as time and motion. However, these things, though different, are inseparable.