Leibniz

Published by the
University of Manchester at
The University Press
316-324, Oxford Road
Manchester 13
1956

Printed in Great Britain by Butler & Tanner Ltd., Frome and London

TABLE OF CONTENTS

ABBREVIATIONS

References to the Correspondence are given by paragraph numbers, e.g. L.I.1 for the first paragraph of Leibniz's first paper, C.IV.15 for the fifteenth paragraph of Clarke's fourth reply. Clarke numbered the paragraphs in his replies to correspond to those in the previous paper of Leibniz, e.g. C.III.5 answers L.III.5.

G.— *Die philosophischen Schriften von G.W. Leibniz*, ed. C. J. Gerhardt.

G.M.—*Leibnizens mathematische Schriften*, ed. C. J. Gerhardt.

INTRODUCTION

I

THE ORIGIN OF THE CORRESPONDENCE

The collection of papers which is now known as the Leibniz-Clarke Correspondence consists of five papers by Leibniz and five replies by Samuel Clarke. They were written in the years 1715 and 1716, and originally published in 1717 in an edition prepared by Clarke. Leibniz had been engaged in a controversy with the Newtonians for several years and in 1715 wrote a letter to Caroline, Princess of Wales, strongly criticizing the philosophical and theological implications of Newton's work. The first paper in the Correspondence is part of this letter. Clarke, a friend and disciple of Newton, attempted to answer these charges in a paper given to Caroline and sent by her to Leibniz.

The Newton-Leibniz Controversy, 1705–1716

The Correspondence was the last phase of a general controversy between Leibniz and the Newtonians which had started in 1705. The original point at issue was whether Leibniz or Newton had been the first to invent the calculus. With each accusing the other of plagiarism the dispute was protracted and acrimonious. Newton at first remained in the background and allowed his case to be argued by his friend Keill, a skilful and outspoken controversialist; Leibniz was more restrained, believing for many years that Keill's articles must have been written without Newton's approval.

Gradually the dispute spread to other issues, of which

CONTENTS

PREFACE

The exchange of papers between Leibniz and Clarke is the most frequently cited of all eighteenth-century philosophical controversies. For their contemporaries it was the final confrontation of ' the mathematical philosophy ', represented by Newton and his champion Clarke, and ' the metaphysical philosophy '. To many modern observers it appears to mark one of the final stages in that temporary emancipation of the natural sciences from philosophy and theology, which made possible the progress of science in the two succeeding centuries.

This is the first complete edition in English since 1738. The text follows exactly that of the first edition of 1717 prepared by Clarke himself, except that the spelling has been modernized, italics and capital letters have been removed, and the arrangement of the marginal references and footnotes simplified. The original punctuation has been retained. Clarke's translation of Leibniz's papers is extremely accurate, and editorial comment has been necessary only at a very few points.

Since the Correspondence is chiefly concerned with the wider implications of Newton's physics, we have added an appendix containing those passages in the *Principia* and *Opticks* which are mentioned in the Correspondence, and also the sections in which Newton expresses his general views on philosophy and scientific method.

I must thank Professor S. E. Toulmin of Leeds University for advice on a large number of topics ; Mr. E. Wild and Mr. M. B. Glauert of Manchester University for their help with the sections of the Introduction on relativity and Newtonian dynamics ; Professor G. Martin of Mainz for the information contained in the note on p. xlv ; and the general editor of the series for his assistance throughout.

H. G. A.

August, 1955.

the most prominent was Leibniz's attack on the Newtonian theory of gravity. He first made this criticism in print in the *Theodicy*, published in 1710 (*Discours de la Conformité de la Foi avec la Raison*, §19), where he accuses Newton of reintroducing the outmoded idea of action at a distance. He repeated the charge in a correspondence with the Dutch physician Hartsoeker, published in the *Journal de Trévoux* of 1712 and reprinted in the *Journal des Savants*. In this letter Leibniz refers to gravity as 'an occult quality' and says that it would be a perpetual miracle if planets were to move in circular orbits without some medium impelling them. Newton himself addressed a reply to the editor justifying his use of the concept of gravity, but his letter was never published.[1]

Leibniz's criticisms were also answered in Cotes's preface to the second edition of the *Principia* (1713), in a passage so forthright as to make Leibniz describe the preface as *pleine d'aigreur*. Even more strongly worded were two articles by Keill in the *Philosophical Transactions* of 1714, translated and reprinted in the *Journal Littéraire*. Keill here dismisses Leibniz's claim to have developed the calculus independently, and goes on to reject Leibniz's theory of gravity and pour scorn on his whole philosophical method.

During this controversy the only exchange of letters between Leibniz and Newton was in the winter of 1715–16 after the Correspondence with Clarke had begun. The intermediary was the Abbé Conti, a Venetian then visiting London, to whom Leibniz wrote defending himself from the accusations of plagiarism in the calculus and criticizing Newton on various grounds. In addition to his usual remarks on gravity, Leibniz in this letter touches on several points discussed in the Correspondence and concludes by accusing Newton of departing from the experimental method in physics.

Conti showed this letter to Newton, who wrote an indig-

[1] Brewster, *Memoirs of Sir Isaac Newton*, II, 283.

nant reply addressed to Conti but clearly intended for Leibniz. As far as is known, this correspondence ended with Leibniz's answer to this letter of Newton's.

The sections of these letters which deal with philosophical issues are reprinted in Appendix B (pp. 184–188); the remaining parts concern the calculus and are omitted.

Samuel Clarke (1675–1729)

Leibniz's letter to Caroline extended the dispute between him and the Newtonians to theological and philosophical issues. Undoubtedly the Englishman best qualified to deal with such questions was Clarke, who had a considerable knowledge of theology, philosophy and science.

Clarke's scientific work consists of two translations into Latin. The first (1697) was of Rohault's *Physics*, which was the standard Cartesian text-book on the subject; the other (1706) of Newton's *Opticks*. In his edition of Rohault Clarke added copious footnotes expounding parts of Newton's physics so that, in places, the footnotes refute the text. This composite work became very popular, was reprinted several times, and even translated into English. It was still used as a text-book in Cambridge as late as 1730.

In philosophy and natural theology, Clarke's reputation rested on the two sets of Boyle lectures which he delivered in 1704 and 1705. The first set is devoted to proving the existence of God by a method 'as near mathematical as the nature of such a discourse would allow'. In the second Clarke tries to show that moral laws are as certain as the propositions of mathematics.

Like Newton, Clarke's theological beliefs were strongly tinged with Arianism. His book *The Scripture Doctrine of the Trinity* was so violently criticized by orthodox churchmen that he was removed from his position as one of Queen Anne's chaplains. Voltaire—who had a very high regard for Clarke—tells a story (*Oeuvres*, 1785, LV, p. 96) of how Gibson, Bishop of Lincoln, prevented Clarke's elevation

to the See of Canterbury by telling Princess Caroline that Clarke was the most learned and honest man in her dominions, but had one defect—he was not a Christian.

Caroline, Leibniz, and Clarke

The letter from Leibniz to Caroline, which begins the Correspondence, was one of a series of letters exchanged by Caroline and Leibniz in the years between her arrival in England and his death. These concern both personal matters—such as Leibniz's arrears of pay—and philosophical and theological questions. The parts of these letters which bear on the Correspondence are given in Appendix B.

Caroline's friendship with Leibniz had begun in her youth when she had stayed at the Court of Berlin with Frederick I and his wife Sophia Charlotte, who was herself a close friend and disciple of Leibniz. It was renewed in 1705 on Caroline's marriage to the Electoral Prince of Hanover, later George II of England, as Leibniz was librarian and political secretary to the Elector. Her acquaintance with Clarke appears to have been the result of her efforts to find someone to translate the *Theodicy* into English. Although Clarke refused to undertake this, he became a frequent visitor at court and eventually almost took Leibniz's place as the Princess's philosophical mentor.

The letters of Caroline to Leibniz show that she took a close interest in the debate between him and Clarke. At first she was strongly in sympathy with Leibniz, but later became converted to Clarke's views on some of the topics under discussion. Her letters also provide evidence that Clarke asked Newton's advice before writing his replies, and that Leibniz considered the exchange of papers sufficiently important to be published.

II

THE ARGUMENT OF THE CORRESPONDENCE

Summary of the Argument

The Correspondence as published in 1717 starts with the part of Leibniz's letter to Caroline in which he asserts that Newton's works have contributed to a decline of natural religion in England. He refers to two passages in Newton's writings. The first is where Newton speaks of space as the 'sensorium of God', a phrase which Leibniz interprets as meaning that space is God's sense-organ. The other is the passage which implies that God occasionally intervenes in the universe; Leibniz comments that such a theory assimilates God to a watchmaker who has from time to time to wind up and even to mend the watch he has made.

In later papers Leibniz makes other criticisms. One of these is the charge that gravity is a scholastic occult quality, and that it would be a miracle for planets to move round the sun without some medium to impel them. Another is that the notion of a vacuum is only a 'pleasing imagination' which can be disproved on *a priori* grounds.

The major part of the Correspondence starts from a discussion of the principle of sufficient reason, namely that there must be a sufficient reason why everything is as it is and not otherwise. Leibniz in his third paper accuses the Newtonians of not understanding this principle. For it entails the principle of the identity of indiscernibles; and this can be used to refute the Newtonian theory of space and time according to which points of space and instants of time are real, distinct, but indiscernible entities. Leibniz develops, in opposition to this, his own theory of space as the order of coexistent phenomena, and time as the order of successive phenomena. That is, space and time are for Leibniz not real substances but relations, and consequently 'ideal things'.

All these points are taken up by Clarke. He tries to

explain what Newton meant by saying that space 'is, as it were, the sensorium of God' and shows that this does not imply that God needs any sense-organ. Clarke admits that on Newton's theory God has to intervene in the universe, but denies that this derogates from God's perfection since such interventions are part of his plan. This gives rise to a discussion of the notion of the miraculous, in which Clarke repudiates the accusation that gravity is, for the Newtonians, a perpetual miracle, and retorts that Leibniz's pre-established harmony which precludes any interaction between soul and body, would be far more miraculous.

When in his fourth paper he comes to discuss the existence of the vacuum and the nature of space and time, Clarke cites empirical evidence in support of the Newtonian position. He interprets Guerike's experiments with the air pump and Torricelli's work with mercury barometers as conclusive proof of the existence of vacua. As further evidence he refers to other experiments which show that different liquids have different specific gravities and provide different degrees of resistance to moving bodies. These results, he suggests, indicate that some substances contain more matter per unit volume than others, and that therefore there must be, in at least some substances, empty space between the ultimate particles of matter.

In his treatment of space and time Clarke refers to the arguments used by Newton in the *Principia* and the experiments quoted there. Clarke argues that these show that one must distinguish absolute from relative motion, and therefore absolute space and time from relative space and time. He goes on to say that, in themselves, space and time are neither substances nor relations, but attributes. He clearly implies that they are attributes of God but refuses to say so explicitly when pressed by Leibniz.

The following are detailed comments on some of the more important topics.

Natural Religion [L.I.1] [1]

The correspondence develops out of Leibniz's accusation that Newtonian views are contributing to a decline of natural religion in England. This was a charge that must have particularly incensed Newton and Clarke. In the *Principia* and *Opticks* Newton had expressed his conviction that his discoveries in physics provided new evidence for the existence and providence of God; in their Boyle lectures, both Clarke and Bentley had drawn arguments for God's existence from Newtonian physics; and Newton had written to Bentley about these lectures, 'When I wrote my treatise about our system, I had an eye upon such principles as might work with considering men for the belief of a Deity, and nothing can rejoice me more than to find it useful for that purpose' (first letter to Bentley, 10th December 1692).

Space as the Sensorium of God [L.I.3, L.II.3–4, L.III.10–12, L.IV.24f., L.V.78f.]

The first point in Leibniz's attack on Newton's theology is that Newton regards the universe as independent of God since God is represented as needing an organ, namely space, in order to perceive created things. This is a reference to the two passages in which Newton speaks of space as the sensorium of God. In *Opticks*, Query 28 (Appendix A, p. 174), he writes: '. . . does it not appear from phenomena that there is a Being incorporeal, living, intelligent, omnipresent, who in infinite space, as it were in his sensory, sees the things themselves intimately, and throughly perceives them, and comprehends them wholly by their immediate presence to himself: of which things the images only carried through the organs of sense into our little sensoriums, are there seen and beheld by that which

[1] Since Clarke numbered the paragraphs of his replies to match those of Leibniz's papers, only the references to Leibniz's papers are given here and at the head of the following sections.

which suggested something very like the continual divine action which Leibniz ridiculed. In his third letter to Bentley, Newton says : ' It is inconceivable that inanimate brute matter should, without the mediation of something else which is not material, operate upon and affect other matter without mutual contact ' ; and Clarke in his Boyle Lectures (*Works*, II, p. 601) speaks of gravity as due to something ' superior to matter *continually* exerting on it a certain force or power ', the world therefore ' depending every moment on some superior being, for the preservation of its frame '.

The Vacuum [L.II.2, L.III.9, L.IV.7, 21–23, PS., L.V.33–35]

Leibniz uses two arguments against the existence of vacua in nature. He argues first (L.II.2, etc.) that the more matter there is in the universe, the more perfect it will be ; and therefore God will have filled the whole universe with matter. His second argument (L.IV, PS.) is that if there were vacua, there would be no sufficient reason for determining the exact proportion of matter to empty space.

These, however, were not the considerations which had first led Leibniz to deny the existence of the vacuum. In his youth he had accepted the Cartesian theory according to which extension and matter were equivalent terms and *vacuum*, therefore, a self-contradictory expression. Leibniz abandoned this view on his discovery in dynamics of inertia (mass). For, if matter was only extension, it would be equally easy to move large and small bodies. (See e.g. *Specimen Dynamicum*, G.M.VI, 234–246.) He writes, for example : ' I make the very notion of *materia prima* or of mass consist in this passive force of resistance (involving impenetrability and something more) which is always the same in bodies and proportional to their size ' (G.IV.5). Leibniz later returned to the opinion that there was no vacuum. This first rejection of the Cartesian theory

explains why he always held the non-existence of a vacuum to be a contingent rather than a necessary truth—that is, its truth depended on the principle of sufficient reason, not just on the principle of contradiction.

In the Correspondence (L.IV, PS.) he tells how he abandoned the ' pleasing imagination of a vacuum and atoms '. The phrase gives the clue to his real reasons for denying the vacuum. For Leibniz, the vacuum and atoms went together, so that the choice was between this picture of the universe—the picture that Newton accepted—and what was essentially the Cartesian view of an infinite plenum with infinitely divisible bodies moving in vortices of aether. Once Leibniz rejected atoms, he also had to reject the vacuum.

For denying atoms he had several reasons. It involved a breach of continuity to suppose that at a certain stage in division one came to ultimate units ; philosophically, atomism led to materialism since the atoms would inevitably be regarded as fully real ; the existence of atoms would contradict the principle of the identity of indiscernibles ; and in dynamics they would contradict the principle of the conservation of moving force (kinetic energy) since atoms are hard and inelastic, while for motive force to be conserved all particles would have to be perfectly elastic (cf. G.VII.285 note).

Having once abandoned his former belief in a vacuum and atoms, Leibniz never seriously considered the empirical evidence which was adduced by Guerike, Torricelli, and the Newtonians. In the Correspondence (L.V.34–35) he mentions some of the experiments but claims that they do not prove the existence of a vacuum for there will still be, in the apparent vacuum, beams of light, magnetic effluvia and other matter ' void of heaviness '. To Clarke's argument that the different resistances of mercury and water show that mercury is more dense, Leibniz replies that it is not so much the quantity of matter as its ' difficulty of giving place ' (viscosity) that causes resistance.

Leibniz is, in fact, right in arguing that viscosity is a more important factor than density in the resistance of liquids to moving bodies. His attempt to deal with the first objection by postulating matter ' void of heaviness ' is less satisfactory. Both Leibniz and the Newtonians agreed that matter was to be defined by its inertial properties, and so matter without inertia, as seems to be implied here, is self-contradictory.

The Principle of Sufficient Reason [L.II.1, L.III.7–8, L.IV.1–2, 13–20, L.V.1–20, 66–73, 76–77]

One of the topics discussed at length by Leibniz and Clarke is the interpretation to be placed on the principle of sufficient reason. Leibniz claims at the beginning of his second paper that from this one principle (together with the principle of contradiction) one can deduce the whole of metaphysics and natural theology. In reply Clarke admits the importance of the principle but suggests that sometimes the reason may be the mere will of God as when He created any body in one part of space rather than another. From this there ensues a dispute about the principle of sufficient reason as applied to God's actions, a discussion of the principle of the identity of indiscernibles, and the whole argument about the nature of space and time.

Closer examination of Leibniz's work shows, however, that at least three distinct principles are indiscriminately referred to as the principle of sufficient reason. There is first what would now be called the causal principle, viz. that nothing happens without a cause. Clarke always interprets the principle in this sense and thus argues that sometimes the sufficient and only reason for an event may be the will of God.

This, however, contradicts the second form of the principle, that God must always have a motive for acting. With human actions, the sufficient reason may be either a motive or, in the case of motiveless actions, e.g. stepping left foot first across a threshold, a cause such as a sub-

conscious perception or passion : for God, the sufficient reason must always be a motive.

The third principle is a stronger form of the second : God must always act for the best. Leibniz uses this in arguing that there cannot be a vacuum since the more matter there is in the universe, the more perfect it is.

The Principle of the Identity of Indiscernibles [L.III.2–6, L.IV.3–6, L.V.21–26]

Although Leibniz usually speaks of the two principles of contradiction and sufficient reason as adequate for metaphysics, he occasionally (e.g. L.IV.5) seems to regard the principle of the identity of indiscernibles as equally important. There are two forms of the principle.

The first is virtually an application of the modern verification principle—that if there is no method of distinguishing between what are alleged to be two distinct states of affairs then there is in fact only one state. Leibniz uses this principle to show that no meaning can be attached to Clarke's contention that the whole universe might be moved in space. Although he applies the principle in the form ' God could have no reason for moving the whole universe ', this reference to God is unnecessary. God's choice is here impossible, not because He has to have certain motives for choosing, but because there are not two genuine alternatives between which choice is possible.

The other and more usual sense of the principle is that there cannot exist two indistinguishable things. In the Correspondence (L.IV.3 etc.), Leibniz deduces this from the principle of sufficient reason by arguing that God could have no motive for arranging two identical pieces of matter in one position rather than the reverse. This argument is, however, fallacious. For consider the example of a chess problem. If a chess player sets out to arrange the pieces on his board in accordance with the diagram of a problem, he will be confronted with choices. For if on the diagram there are white pawns shown on KR4 and

QB2, he will, when he takes the first pawn piece out of the box, have to decide on which of those two squares on his board to place it. If he was Leibniz's God—who always acts rationally—or Buridan's ass, he would never succeed in setting out the problem at all.

The position of the man who invents the problem is quite different. For when in his mind, he decides to put pawns on KR4 and QB2, no choice is involved; the pawns, as it were, only come into existence *in situ*. Now clearly God, when he created the world, was in the position of the man who invented the problem, not the man who set it out on the board. God would have been confronted with a choice only if he already had the constituent parts of the universe piled together in a box, or if he first devised the plan and then had to create it one part at a time.

This fallacious line of argument was not, however, Leibniz's only reason for holding the principle. Almost certainly he regarded it as a necessary consequence of his whole theory of monads, according to which each monad mirrored the universe from its own point of view. From this it would seem to follow that every monad is different. But this argument is also invalid. One weakness is that Leibniz is relying on a spatial analogy although he holds that spatial relations are unreal. The other is that even if the analogy is accepted, there is no reason why the universe should not be symmetrical. If one had a two-dimensional universe shaped like this,

1	2	3
4	5	6
7	8	9

then monads 1, 3, 7, 9 could be identical, and monads 2, 4, 6, 8, even if they did each mirror the universe from their own viewpoints.

Space and Time [L.III.2–6, L.IV.8ff., L.V.27–32, 36–65, 79–80, 104–106]

The theory of space and time put forward here by Leibniz is the same as had been expressed in all his later writings: space is the order of coexistent phenomena; time is the order of successive phenomena; and both are ideal. Leibniz contrasts this view of space and time as dependent on things with the Newtonian theory of space and time as real independent entities. This is the theory implied by Clarke when he speaks (C.II.1.) of God choosing to create any body in one part of space rather than another.

The ideality of space and time follows, for Leibniz, from the fact that they are neither individual substances nor aggregates of individual substances; for only these are fully real. This line of thought is most clearly expressed in his fifth paper (L.V.47) where he compares spatial and temporal relations with the ratio between two lengths. Such a ratio between two lines can be considered in three ways: as a ratio of the greater to the lesser, in which case logicians would regard it as an accident inhering in the former; or as a ratio of the lesser to the greater; or 'as something abstracted from both'. In this third way the relation is in neither subject but 'being neither a substance, nor an accident, it must be a mere ideal thing, the consideration of which is nevertheless useful'. That is to say, propositions which concern space and time, like statements about ratios, cannot be expressed in subject-predicate form; therefore space and time cannot be fully real. Nevertheless they must not be taken as unreal and groundless since 'their truth is grounded in God' (*New Essays*, II.13.17).

A relational theory of space and time appears to imply that no meaning can be attached to such phrases as *absolute position* or *absolute motion*. It would seem to be impossible to say that A is moving and B and C stationary rather than that B and C are moving and A stationary. Leibniz draws

Leibniz is, in fact, right in arguing that viscosity is a more important factor than density in the resistance of liquids to moving bodies. His attempt to deal with the first objection by postulating matter ' void of heaviness ' is less satisfactory. Both Leibniz and the Newtonians agreed that matter was to be defined by its inertial properties, and so matter without inertia, as seems to be implied here, is self-contradictory.

The Principle of Sufficient Reason [L.II.1, L.III.7–8, L.IV.1–2, 13–20, L.V.1–20, 66–73, 76–77]

One of the topics discussed at length by Leibniz and Clarke is the interpretation to be placed on the principle of sufficient reason. Leibniz claims at the beginning of his second paper that from this one principle (together with the principle of contradiction) one can deduce the whole of metaphysics and natural theology. In reply Clarke admits the importance of the principle but suggests that sometimes the reason may be the mere will of God as when He created any body in one part of space rather than another. From this there ensues a dispute about the principle of sufficient reason as applied to God's actions, a discussion of the principle of the identity of indiscernibles, and the whole argument about the nature of space and time.

Closer examination of Leibniz's work shows, however, that at least three distinct principles are indiscriminately referred to as the principle of sufficient reason. There is first what would now be called the causal principle, viz. that nothing happens without a cause. Clarke always interprets the principle in this sense and thus argues that sometimes the sufficient and only reason for an event may be the will of God.

This, however, contradicts the second form of the principle, that God must always have a motive for acting. With human actions, the sufficient reason may be either a motive or, in the case of motiveless actions, e.g. stepping left foot first across a threshold, a cause such as a sub-

conscious perception or passion : for God, the sufficient reason must always be a motive.

The third principle is a stronger form of the second : God must always act for the best. Leibniz uses this in arguing that there cannot be a vacuum since the more matter there is in the universe, the more perfect it is.

The Principle of the Identity of Indiscernibles [L.III.2–6, L.IV.3–6, L.V.21–26]

Although Leibniz usually speaks of the two principles of contradiction and sufficient reason as adequate for metaphysics, he occasionally (e.g. L.IV.5) seems to regard the principle of the identity of indiscernibles as equally important. There are two forms of the principle.

The first is virtually an application of the modern verification principle—that if there is no method of distinguishing between what are alleged to be two distinct states of affairs then there is in fact only one state. Leibniz uses this principle to show that no meaning can be attached to Clarke's contention that the whole universe might be moved in space. Although he applies the principle in the form ' God could have no reason for moving the whole universe ', this reference to God is unnecessary. God's choice is here impossible, not because He has to have certain motives for choosing, but because there are not two genuine alternatives between which choice is possible.

The other and more usual sense of the principle is that there cannot exist two indistinguishable things. In the Correspondence (L.IV.3 etc.), Leibniz deduces this from the principle of sufficient reason by arguing that God could have no motive for arranging two identical pieces of matter in one position rather than the reverse. This argument is, however, fallacious. For consider the example of a chess problem. If a chess player sets out to arrange the pieces on his board in accordance with the diagram of a problem, he will be confronted with choices. For if on the diagram there are white pawns shown on KR4 and

this conclusion explicitly in one of his letters to Huygens (June 1694, G.M.II.184).

> For if there are 1000 bodies, I still hold that phenomena cannot give us any infallible way of determining which are moving and in what degree ; and that each separately could be considered as being at rest . . . Mr. Newton recognizes the equivalence of hypotheses in the case of rectilinear motion, but with regard to circular motion he believes that the effort which revolving bodies make to recede from the axis of rotation enables one to know their absolute motion. But I have reasons for believing that nothing breaks this general law of equivalence. [Leibniz does not state what these reasons are.]

But there are other passages which contradict this. In some of these it is suggested that moving force (kinetic energy) is real, and therefore when a body possesses moving force it has an absolute and real motion. In his letter to Huygens just quoted he writes : 'As for the difference between absolute and relative motion, I believe that if motion, or rather the moving force of bodies is something real, as it seems one must admit, it is necessary that it has a *subjectum*.' The same view is expressed more clearly in the *Discourse on Metaphysics*, § 18, and *Phoronamus* (*Arch. f. Gesch. d. Phil.* I.577).

In the Correspondence also, Leibniz admits (L.V.53) that '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.' Clarke naturally enough claims that this admission is quite incompatible with the theory that space is only the order of coexistent bodies. But Leibniz does not say here whether it is ever possible in practice to determine in which of several bodies the cause of their change of relative position lies and so to discover which is truly in motion. He may therefore have held that the distinction between absolute and relative motion is metaphysical, not physical : that is, the absolute motion of a body can never be experimentally

determined ; and so the concept of absolute motion is of no use in physics. Such an interpretation is supported by his statement in the *Discourse on Metaphysics*, that moving force is a metaphysical concept. There is, however, no doubt that this admission of the distinction between absolute and relative motion is inconsistent with his general theory of space.

Clarke raises three main objections against Leibniz's relational theory. One of these (C.III.2, etc.) is that the theory is self-contradictory since it implies that if the whole universe were displaced, it would still be in the same position—which is impossible. Leibniz points out that this objection evades the whole point at issue.

Clarke's second argument (C.IV.13, etc.) is that experiments show that it is necessary to distinguish absolute from relative motion ; but absolute motion implies absolute space and time. Most of his examples are drawn from the Scholium to Definition 8 in the *Principia*, the section in which Newton elaborates his theory of space and time. The Scholium is discussed below, pp. xxxiv–xl.

The third argument which Clarke uses against Leibniz (C.III.4), is that space and time cannot be merely relations, since they are quantities. Leibniz attempts to meet the objection (L.V.54) by saying that numerical ratios are relations but yet 'have their quantity' ; but it is difficult to see how the analogy holds. In fact, the objection shows that any relational theory of space and time is radically incomplete unless supplemented by an analysis of the process of measurement. Leibniz never provides such an analysis.

This deficiency in his theory is also evident in the Correspondence when he discusses the finiteness of the universe and the existence of the vacuum. Leibniz holds that the universe is spatially infinite, though finite in time, and that there are no vacua ; but he explicitly states that these are contingent truths. Although God could have willed otherwise, he has not done so because an infinite, fully-filled universe is the best possible.

But, Clarke asks, how could the universe possibly be finite if space is relational? What meaning can be attached either to the finiteness of the universe or the existence of vacua unless space is regarded as independent of material things?

In an essay on the Correspondence,[1] Broad attempts to meet this objection. He suggests that, on the relational theory, the statement that the universe is finite can be interpreted thus: if the distance PQ is taken as standard, then there is a finite number N such that for any points x, y the distance xy is less than N times the distance PQ. The statement that there are no vacua in nature might be interpreted by developing the definition of an empty linear segment as a pair of particles PQ such that there was no particle between them—a definition that seems to presuppose the infinite divisibility of matter.

Such an interpretation, however, goes far beyond any suggestion made by Leibniz, who never realized this weakness of his theory. In fact, like his opponents, Leibniz in his less reflective moments seems to have thought of space as some infinite aethereal substance containing and, at the same time, permeating the material world.

Clarke, however, does not confine himself to defending Newton's theory and attacking Leibniz's. He also puts forward a theory of his own—that space and time are neither substances nor relations, but attributes. This theory also appears in Clarke's Boyle Lectures (*Works*, II, 527–530), but there is no evidence that it was held by anyone else on the Newtonian side.

As Leibniz points out, such a view is untenable. It implies either that space and time are properties of a God who pervades the whole universe; or else that they are properties which belong to one thing after another—'subjects will leave off their accidents, like clothes; that other subjects may put them on'. A passage in Des Maiseaux's preface to his 1720 edition of the Correspondence shows that even Clarke realized some of the difficulties of the theory.

[1] C. D. Broad, *Ethics and the History of Philosophy*, pp. 168–191.

Since the terms *quality* or *property* have normally a sense different from that in which they must be taken here, M. Clarke has asked me to warn his readers that "when he speaks of infinite space or immensity and infinite duration or eternity, and gives them, through an inevitable imperfection of language, the name of qualities or properties of a substance which is immense or eternal, he does not claim to take the term *quality* or *property* in the same sense as they are taken by those who discuss logic or metaphysics when they apply them to matter; but that by this name he means only that space and duration are modes of existence of the Substance which is really necessary, and substantially omnipresent and eternal. This existence is neither a substance nor a quality nor a property; but is the existence of a Substance with all its attributes, all its qualities, and all its properties; and place and duration are modes of this existence of such a kind that one cannot reject them without rejecting the existence itself. When we speak of things which do not fall under the senses it is difficult to speak without using figurative expressions".

Measurement of Force (C.V.93–95)

In Clarke's fifth paper there occurs a long footnote in which he discusses the proper way of computing the impulsive force of a moving body. Clarke is here taking up an issue which had been disputed for the previous thirty years and which was to continue under dispute for the next thirty. On the one side Leibniz and his followers maintained that the 'force' of moving bodies should be measured by the product of mass and velocity squared (mv^2); on the other, the Cartesians and the Newtonians contended that it should be measured by the simple product of mass and velocity (mv). (This, of course, is not the same as the Newtonian concept of force as mass multiplied by acceleration.)

Both sides were, to some extent, right; for, as Newtonian dynamics was developed, it became clear that both concepts were important. The product mv is called *momentum*

On the opposite page is printed the relevant part of the original title page. The edition of 1717 also included as an addition separately paginated *Letters to Dr. Clarke concerning Liberty and Necessity*; *From a Gentleman of the University of Cambridge* [actually R. Bulkeley] : *With the Doctor's Answers to them*, and *Remarks upon a Book* [by A. Collins], *Entituled, A Philosophical Enquiry concerning Human Liberty*.

A

COLLECTION OF PAPERS

which passed between the late Learned

Mr. LEIBNITZ

AND

Dr. CLARKE

in the years 1715 and 1716

relating to the

PRINCIPLES

OF

NATURAL PHILOSOPHY AND RELIGION

With an Appendix

*

by SAMUEL CLARKE, D.D.
Rector of St. James's, Westminster

*

LONDON : Printed for JAMES KNAPTON
at The Crown in St. Paul's Churchyard
MDCCXVII

the noble zeal and spirit of the father; the affability, goodness, and judicious exactness of the mother; may, with glory to themselves, and with the happiest influences both upon these and foreign countries, descend to all succeeding generations; to the establishment of universal peace, of truth and right amongst men; and to the entire rooting out that greatest enemy of Christian religion, the spirit of Popery both among Romanists and Protestants: and that Your Royal Highness may your self long live, to continue a blessing to these nations, to see truth and virtue flourish in your own days, and to be a great instrument, under the direction of providence, in laying a foundation for the highest happiness of the public in times to come; is the prayer of,

Madam,
Your Royal Highnesses
most humble and
most obedient servant,
Sam. Clarke.

ADVERTISEMENT TO THE READER [1]

The reader will be pleased to observe

1. That the following letters are all printed exactly as they were written; without adding, diminishing, or altering a word. The marginal notes only, and the Appendix, being added.

2. That the translation is made with great exactness, to prevent any misrepresentation of Mr. Leibnitz's sense.

3. That the numbers of sections in each of Dr. Clarke's papers, refer respectively to the numbers or sentences of each of Mr. Leibnitz's papers immediately foregoing.

[1] Clarke inserted in the original edition a large number of marginal references. In this edition we have omitted those which refer to subsequent paragraphs of the Correspondence, to previous paragraphs of the same paper, and to Clarke's Appendix of passages from Leibniz; but we have added before each section of the Appendix a list of the paragraphs in the text where Clarke had inserted a reference to that section. The many marginal references to Leibniz's Fifth Paper in Clarke's Fifth Reply have been incorporated into the text. His remaining references (i.e. those to previous papers) are printed as footnotes.

Clarke's footnotes have here been assigned letters; numbered footnotes are the editor's. Square brackets in footnotes indicate editorial insertions.

the workman. But with regard to God, the case is quite different; because he not only composes or puts things together, but is himself the author and continual preserver of their original forces or moving powers: and consequently 'tis not a diminution, but the true glory of his workmanship, that nothing is done without his continual government and inspection. The notion of the world's being a great machine, going on without the interposition of God, as a clock continues to go without the assistance of a clockmaker; is the notion of materialism and fate, and tends, (under pretence of making God a *supra-mundane intelligence*,) to exclude providence and God's government in reality out of the world. And by the same reason that a philosopher can represent all things going on from the beginning of the creation, without any government or interposition of providence; a sceptic will easily argue still farther backwards, and suppose that things have from eternity gone on (as they now do) without any true creation or original author at all, but only what such arguers call all-wise and eternal nature. If a king had a kingdom, wherein all things would continually go on without his government or interposition, or without his attending to and ordering what is done therein; it would be to him, merely a nominal kingdom; nor would he in reality deserve at all the title of king or governor. And as those men, who pretend that in an earthly government things may go on perfectly well without the king himself ordering or disposing of any thing, may reasonably be suspected that they would like very well to set the king aside: so whosoever contends, that the course of the world can go on without the continual direction of God, the Supreme Governor; his doctrine does in effect tend to exclude God out of the world.

MR. LEIBNITZ'S SECOND PAPER

being

An Answer to Dr. Clarke's First Reply

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,[1] 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 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

[1] 'les passions vitieuses'.

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.

2. The author proceeds, and says, that according to the mathematical principles, that is, according to Sir Isaac Newton's philosophy, (for mathematical principles determine nothing in the present case,) matter is the most inconsiderable part of the universe. The reason is, because he admits empty space, besides matter; and because, according to his notions, matter fills up only a very small part of space. But Democritus and Epicurus maintained the same thing: they differ'd from Sir Isaac Newton, only as to the quantity of matter; and perhaps they believed there was more matter in the world, than Sir Isaac Newton will allow: wherein I think their opinion ought to be preferred; for, the more matter there is, the more God has occasion to exercise his wisdom and power. Which is one reason, among others, why I maintain that there is no vacuum at all.

3. I find, in express words, in the Appendix to Sir Isaac Newton's *Opticks*, that space is the *sensorium* of God. But the

word *sensorium* hath always signified the organ of sensation. He, and his friends, may now, if they think fit, explain themselves quite otherwise: I shall not be against it.

4. The author supposes that the presence of the soul is sufficient to make it perceive what passes in the brain. But this is the very thing which Father Malebranche, and all the Cartesians deny; and they rightly deny it. More is requisite besides bare presence, to enable one thing to perceive what passes in another. Some communication, that may be explained; some sort of influence, is requisite for this purpose. Space, according to Sir Isaac Newton, is intimately present to the body contained in it, and commensurate with it. Does it follow from thence, that space perceives what passes in a body; and remembers it, when that body is gone away? Besides, the soul being indivisible, its immediate presence, which may be imagined in the body, would only be in one point. How then could it perceive what happens out of that point? I pretend to be the first, who has shown how the soul perceives what passes in the body.

5. The reason why God perceives every thing, is not his bare presence, but also his operation. 'Tis because he preserves things by an action, which continually produces whatever is good and perfect in them. But the soul having no immediate influence over the body, nor the body over the soul; their mutual correspondence cannot be explained by their being present to each other.

6. The true and principal reason why we commend a machine, is rather grounded upon the effects of the machine, than upon its cause. We don't enquire so much about the power of the artist, as we do about his skill in his workmanship. And therefore the reason alleged by the author for extolling the machine of God's making, grounded upon his having made it entirely, without wanting any materials to make it of;[1] that reason, I say, is not sufficient. 'Tis

[1] 'sans avoir emprunté de la matière de dehors', i.e. without having taken materials from elsewhere.

have no occasion ever to be amending any thing amongst them ; would be only a nominal king.

12. To conclude. If God is oblig'd to mend the course of nature from time to time, it must be done either supernaturally or naturally. If it be done supernaturally, we must have recourse to miracles, in order to explain natural things : which is reducing an hypothesis *ad absurdum* : for, every thing may easily be accounted for by miracles. But if it be done naturally, then God will not be *intelligentia supramundana* : he will be comprehended under the nature of things ; that is, he will be the soul of the world.

DR. CLARKE'S SECOND REPLY [1]

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

[1] Transmitted 10th Jan. 1716 (p. 193).

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.

2. Many ancient Greeks, who had their philosophy from the Phœnicians, and whose philosophy was corrupted by Epicurus, held indeed in general matter and vacuum ; but they knew not how to apply those principles by mathematics, to the explication of the phenomena of nature. How small soever the quantity of matter be, God has not at all the less subject to exercise his wisdom and power upon : for, other things, as well as matter, are equally subjects, on which God exercises his power and wisdom. By the same argument it might just as well have been proved, that men, or any other particular species of beings, must be infinite in number, lest God should want subjects, on which to exercise his power and wisdom.

3. The word *sensory* does not properly signify the organ, but the place of sensation. The eye, the ear, etc., are organs, but not sensoria. Besides, Sir Isaac Newton does not say, that space is the sensory ; but that it is, by way of similitude only, *as it were the sensory*, *&c.*

4. It was never supposed, that the presence of the soul was sufficient, but only that it is necessary in order to perception. Without being present to the images of the things perceived, it could not possibly perceive them : but being present is not sufficient, without it be also a living substance. Any inanimate substance, tho' present, perceives nothing : and a living substance can only there perceive, where it is present either to the things themselves, (as the omnipresent God is to the whole universe ;) or to the images of things, (as the soul of man is in its proper sensory.) Nothing can any more act, or be acted upon,

the governing and ordering of the natural world. But the truth is; *natural* and *supernatural* are nothing at all different with regard to God, but distinctions merely in our conceptions of things. To cause the sun (or earth) to move regularly, is a thing we call natural: to stop its motion for a day, we call supernatural: but the one is the effect of no greater power, than the other; nor is the one, with respect to God, more or less natural or supernatural than the other. God's being present in or to the world, does not make him to be the soul of the world.[a] A soul, is part of a compound, whereof body is the other part; and they mutually affect each other, as parts of the same whole. But God is present to the world, not as a part, but as a governor; acting upon all things, himself acted upon by nothing. He is not far from every one of us, for in him we (and all things) live and move and have our beings.

[a] [Clarke quotes here from the General Scholium in the *Principia*, parts of the paragraph that begins 'This Being governs all things . . .', Appendix A, p. 166.]

MR. LEIBNITZ'S THIRD PAPER [1]

being

An Answer to Dr. Clarke's Second Reply

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*.[2]

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 [3] relative, as time is; that I hold it to be an order of coexistences, as

[1] Despatched 25th Feb. 1716 (p. 193).

[2] 'idols of the tribe, idols of the cave', *Novum Organum* I, Aphor. 38 ff.

[3] 'purement'.

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.

6. The case is the same with respect to time. Supposing any one should ask, why God did not create every thing

a year sooner ; and the same person should infer from thence, that God has done something, concerning which 'tis not possible there should be a reason, why he did it so, and not otherwise : the answer is, that his inference would be right, if time was any thing distinct from things existing in time. For it would be impossible there should be any reason, why things should be applied to such particular instants, rather than to others, their succession continuing the same. But then the same argument proves, that instants, consider'd without the things, are nothing at all ; and that they consist only in the successive order of things : which order remaining the same, one of the two states, viz. that of a supposed anticipation, would not at all differ, nor could be discerned from, the other which now is.

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 otherwhere 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.

8. The author objects against me, that if we don't admit this simple and mere will, we take away from God the power of choosing, and bring in a fatality. But the quite contrary is true. I maintain that God has the power of choosing, since I ground that power upon the reason of a choice agreeable to his wisdom. And 'tis not this fatality,

between these two things; but it plainly appears, it has not been duly consider'd. That which is supernatural, exceeds all the powers of creatures. I shall give an instance, which I have often made use of with good success. If God would cause a body to move free in the aether round about a certain fixed centre, without any other creature acting upon it: I say, it could not be done without a miracle; since it cannot be explained by the nature of bodies. For, a free body does naturally recede from a curve in the tangent. And therefore I maintain, that the attraction of bodies, properly so called, is a miraculous thing, since it cannot be explained by the nature of bodies.

DR. CLARKE'S THIRD REPLY [1]

1. This relates only to the signification of words. The definitions here given, may well be allowed; and yet mathematical reasonings may be applied to physical and metaphysical subjects.

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 indifferency of all places, to prove that no space

[1] Transmitted 15th May 1716, delayed (p. 194).

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 [a] 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; [b] 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.[c] The

[a] This was occasioned by a passage in the private letter wherein Mr. Leibnitz's third paper came inclosed. [Gerhardt says that there is no trace among the Leibniz papers of this letter. Klopp's edition of the Leibniz-Caroline correspondence also contains nothing relevant.]

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

[c] See above, § 4 of my Second Reply.

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 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 ?

6. The same reasoning takes place here, as in the foregoing.

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 a 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.

9. I suppose, that determinate quantity of matter, which is now in the world, is the most convenient for the present frame of nature, or the present state of things : and that a greater (as well as a less) quantity of matter, would have made the present frame of the world less convenient ; and consequently would not have been a greater object for God to have exercised his goodness upon.

10. The question is not, what Goclenius, but what Sir Isaac Newton means by the word *sensorium*, when the debate is about the sense of Sir Isaac Newton's, and not about the sense of Goclenius's book. If Goclenius takes the eye, or ear, or any other organ of sensation, to be the sensorium ; he is certainly mistaken. But when any writer expressly explains what he means by any term of art ; of what use is it, in this case, to enquire in what different senses perhaps some other writers have sometimes used the same word ? Scapula [1] explains it by *domicilium*, the place where the mind resides.

11. The soul of a blind man does for this reason not see, because no images are conveyed (there being some obstruction in the way) to the sensorium where the soul is present. How the soul of a seeing man, sees the images to which it is present, we know not : but we are sure it cannot perceive what it is not present to ; because nothing can act, or be acted upon, where it is not.

12. God, being omnipresent, is really present to every

[1] This is not quite accurate. Scapula : *Lexicon Graeco-Latinum* (1639 edition) says '*αἰσθητήριον* : sentienti instrumentum. Nonnulli exp. domicilium sensus', i.e. 'instrument of sensation. Sometimes, place where the sense resides.'

MR. LEIBNITZ'S FOURTH PAPER [1]

being

An Answer to Dr. Clarke's Third Reply.

---

1. In things absolutely indifferent, there is no [foundation for] [2] choice; and consequently no election, nor will; since choice must be founded on some reason, or principle.

2. A mere will without any motive, is a fiction, not only contrary to God's perfection, but also chimerical and contradictory; inconsistent with the definition of the will, and sufficiently confuted in my Theodicy.

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,[3] 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.

[1] Despatched with letter dated 2nd June 1716 (p. 195).

[2] Clarke's addition.

[3] Sophia, Electress of Hanover, mother of George I of England. Herrenhausen was the residence of the Electors of Hanover.

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.[1] 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.

[1] 'il sera plus subsistant que les substances'.

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.

12. The author ascribes parts to space, p. 19. of the 3rd edition of his *Defense of the Argument against Mr. Dodwell* ; [1] and makes them inseparable one from another. But, p. 30 of his *Second Defense*,[1] he says they are parts *improperly so called* : which may be understood in a good sense.

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.

15. It is a like fiction, (that is) an impossible one, to suppose that God might have created the world some millions of years sooner. They who run into such kind of fictions, can give no answer to one that should argue for the eternity of the world. For since God does nothing without reason, and no reason can be given why he did not create the world sooner ; it will follow, either that he has created nothing at all, or that he created the world before any assignable time, that is, that the world is eternal. But when once it has been shown, that the beginning, whenever it was, is always the same thing ;

[1] Clarke, *Works*, vol. III, p. 763 and p. 794.

the question, why it was not otherwise ordered, becomes needless and insignificant.

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] [1] 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.[2] 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.

21. There is no possible reason, that can limit the

[1] Clarke's addition.

[2] Epicurus held that while most atoms moved in regular courses, some occasionally made entirely uncaused swerves. Such a swerve occurring in the atoms of a man's brain gives rise to what the man regards as an act of free will.

quantity of matter ; and therefore such limitation can have no place.

22. And supposing an arbitrary limitation of the quantity of matter, something might always be added to it without derogating from the perfection of those things which do already exist ; and consequently something must always be added, in order to act according to the principle of the perfection of the divine operations.

23. And therefore it cannot be said, that the present quantity of matter is the fittest for the present constitution of things. And supposing it were, it would follow that this present constitution of things would not be the fittest absolutely, if it hinders God from using more matter. It were therefore better to choose another constitution of things, capable of something more.

24. I should be glad to see a passage of any philosopher, who takes *sensorium* in any other sense than Goclenius does.

25. If Scapula says that *sensorium* is the place in which the understanding resides, he means by it the organ of internal sensation. And therefore he does not differ from Goclenius.

26. *Sensorium* has always signified the organ of sensation. The *glandula pinealis* would be, according to Cartesius, the sensorium, in the above-mentioned sense of Scapula.

27. There is hardly any expression less proper upon this subject, than that which makes God to have a sensorium. It seems to make God the soul of the world. And it will be a hard matter to put a justifiable sense upon this word, according to the use Sir Isaac Newton makes of it.

28. Though the question be about the sense put upon that word by Sir Isaac Newton, and not by Goclenius ; yet I am not to blame for quoting the philosophical dictionary of that author, because the design of dictionaries is to show the use of words.

29. God perceives things in himself. Space is the place of things, and not the place of God's ideas : unless we look upon space as something that makes an union between

God and things, in imitation of the imagined union between the soul and the body ; which would still make God the soul of the world.

30. And indeed the author is much in the wrong, when he compares God's knowledge and operation, with the knowledge and operation of souls. The soul knows things, because God has put into it a principle representative of things without. But God knows things, because he produces them continually.

31. The soul does not act upon things, according to my opinion, any otherwise than because the body adapts itself to the desires of the soul, by virtue of the harmony, which God has pre-established between them.

32. But they who fancy that the soul can give a new force to the body ; and that God does the same in the world, in order to mend the imperfections of his machine ; make God too much like the soul, by ascribing too much to the soul, and too little to God.

33. For, none but God can give a new force to nature ; and he does it only supernaturally. If there was need for him to do it in the natural course of things ; he would have made a very imperfect work. At that rate, he would be with respect to the world, what the soul, in the vulgar notion, is with respect to the body.

34. Those who undertake to defend the vulgar opinion concerning the soul's influence over the body, by instancing in God's operating on things external ; make God still too much like a soul of the world. To which I add, that the author's affecting to find fault with the words, *intelligentia supramundana*, seems also to incline that way.

35. The images, with which the soul is immediately affected,[1] are within itself ; but they correspond to those of the body. The presence of the soul is imperfect, and can only be explained by that correspondence. But the presence of God is perfect, and manifested by his operation.

[1] 'affected' is used here not in the sense of 'caused' or 'influenced', but rather in the sense in which a quality is an affect of an object.

36. The author wrongly supposes against me, that the presence of the soul is connected with its influence over the body; for he knows, I reject that influence.

37. The soul's being diffused through the brain, is no less inexplicable, than its being diffused through the whole body. The difference is only in more and less.

38. They who fancy that active force lessens of itself in the world, do not well understand the principal laws of nature, and the beauty of the works of God.

39. How will they be able to prove, that this defect is a consequence of the dependence of things?

40. The imperfection of our machines, which is the reason why they want to be mended, proceeds from this very thing, that they do not sufficiently depend upon the workman. And therefore the dependence of nature upon God, far from being the cause of such an imperfection, is rather the reason why there is no such imperfection in nature, because it depends so much upon an artist, who is too perfect to make a work that wants to be mended. 'Tis true that every particular machine of nature, is, in some measure, liable to be disordered; but not the whole universe, which cannot diminish in perfection.

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.

42. The author seems to acknowledge here, that his notion of a miracle is not the same with that which divines and philosophers usually have. It is therefore sufficient for my purpose, that my adversaries are obliged to have recourse to what is commonly called a miracle.

43. I am afraid the author, by altering the sense commonly put upon the word *miracle*, will fall into an inconvenient opinion. The nature of a miracle does not at all consist in usualness or unusualness; for then monsters would be miracles.

44. There are miracles of an inferior sort, which an angel can work. He can, for instance, make a man walk upon the water without sinking. But there are miracles, which none but God can work; they exceeding all natural powers. Of which kind, are creating and annihilating.

45. 'Tis also a supernatural thing, that bodies should attract one another at a distance, without any intermediate means; and that a body should move round, without receding in the tangent, though nothing hinder it from so receding. For these effects cannot be explained by the nature of things.

46. Why should it be impossible to explain the motion of animals by natural forces? Tho' indeed, the beginning of animals is no less inexplicable by natural forces, than the beginning of the world.

P. S.[1]

All those who maintain a vacuum, are more influenced by imagination than by reason. When I was a young man, I also gave into the notion of a vacuum and atoms; but reason brought me into the right way. It was a pleasing imagination. Men carry their inquiries no farther than those two things: they (as it were) nail down their thoughts to them: they fancy, they have found out the first elements of things, a *non plus ultra*. We would have nature to go no farther; and to be finite, as our minds are: but this is being ignorant of the greatness and majesty of the author of things. The least corpuscle is actually subdivided *in infinitum*, and contains a world of other creatures, which would be wanting in the universe, if that corpuscle was

[1] This 'postscript' was actually written and despatched by Leibniz as a postscript to a private letter to Caroline, dated 12th May 1716. It was occasioned by Caroline's mention of experiments on the vacuum in her letter of 15th May 1716. See Appendix B, p. 194.

an atom, that is, a body of one entire piece without subdivision. In like manner, to admit a vacuum in nature, is ascribing to God a very imperfect work : 'tis violating the grand principle of the necessity of a sufficient reason ; which many have talked of, without understanding its true meaning ; as I have lately shown, in proving, by that principle, that space is only an order of things, as time also is, and not at all an absolute being. To omit many other arguments against a vacuum and atoms, I shall here mention those which I ground upon God's perfection, and upon the necessity of a sufficient reason. I lay it down as a principle, that every perfection, which God could impart to things without derogating from their other perfections, has actually been imparted to them. Now let us fancy a space wholly empty. God could have placed some matter in it, without derogating in any respect from all other things : therefore he has actually placed some matter in that space : therefore, there is no space wholly empty : therefore all is full. The same argument proves that there is no corpuscle, but what is subdivided. I shall add another argument, grounded upon the necessity of a sufficient reason. 'Tis impossible there should be any principle to determine what proportion of matter there ought to be, out of all the possible degrees from a plenum to a vacuum, or from a vacuum to a plenum.[1] Perhaps it will be said, that the one should be equal to the other : but, because matter is more perfect than a vacuum, reason requires that a geometrical proportion should be observed, and that there should be as much more matter than vacuum, as the former deserves to have the preference before the latter. But then there must be no vacuum at all ; for the perfection of matter is to that of a vacuum, as something to nothing. And the case is the same with atoms : what reason can any one assign for confining nature in the progression of subdivision? These are fictions

[1] 'de determiner la proportion de la matière, ou du rempli au vuide, ou du vuide au plein'.

merely arbitrary, and unworthy of true philosophy. The reasons alleged for a vacuum, are mere sophisms.

DR. CLARKE'S FOURTH REPLY [1]

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 ; [a] so that of two things absolutely indifferent, an intelligent agent can no more choose 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

[a] See above, Mr. Leibnitz's Second Paper, § 1.

[1] Transmitted 26th June 1716 (p. 196).

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,[a] though rays of light, and perhaps some other matter, be there in an exceeding small quantity ;

[a] This was occasioned by a passage in the private letter wherein Mr. Leibnitz's paper came inclosed. [This was Leibniz's letter of 2nd June 1716, the relevant parts of which are given in Appendix B, p. 195.]

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 ; [1] 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.[a] And without them, his eternity and ubiquity (or omnipresence) would be taken away.

[a] [Clarke quotes here from the General Scholium in the *Principia*, the passage, ' He is eternal and infinite, . . . cannot be never and nowhere. He is omnipresent not virtually only but also substantially ; for virtue cannot subsist without substance ', Appendix, pp. 167–8.]

[1] Clarke qualifies this use of the term *property* in a note contained in the preface to Des Maiseaux's editions of the Correspondence. Cf. Introduction, p. xxix.

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, 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.

15. It was no impossibility for God to make the world sooner or later than he did: nor is it at all impossible for him to destroy it sooner or later than it shall actually be destroyed. As to the notion of the world's eternity; they who suppose matter and space to be the same, must indeed suppose the world to be not only infinite and eternal, but necessarily so; even as necessarily as space and duration, which depend not on the will, but on the existence of God. But they who believe that God created matter in what quantity, and at what particular time, and in what particular spaces he pleased, are here under no difficulty. For the wisdom of God may have very good reasons for creating this world, at that particular time he did; and may have made other kinds of things before this material world began, and may make other kinds of things after this world is destroyed.

16 and 17. That space and time are not the mere order of things, but real quantities (which order and situation are not;) has been proved above, (See Third Reply, § 4; and in this paper, § 13,) and no answer yet given to those proofs. And till an answer be given to those proofs, this learned author's assertion is (by his own confession in this place) a contradiction.

18. The uniformity of all the parts of space, is no argument against God's acting in any part, after what manner he pleases. God may have good reasons to create finite beings, and finite beings can be but in particular places. And, all places being originally alike, (even though place were nothing else but the situation of bodies;) God's placing one cube of matter behind another equal cube of matter, rather than the other behind that; is a choice no way unworthy of the perfections of God, though both these

situations be perfectly equal : because there may be very good reasons why both the cubes should exist and they cannot exist but in one or other of equally reasonable situations. The Epicurean chance, is not a choice of will, but a blind necessity of fate.

19. This argument, (as I now observed, § 3,) if it proves anything, proves that God neither did nor can create any matter at all ; because the situation of equal and similar parts of matter, could not but be originally indifferent : as was also the original determination of their motions, this way, or the contrary way.

20. What this tends to prove, with regard to the argument before us ; I understand not.

21. That God cannot limit the quantity of matter, is an assertion of too great consequence, to be admitted without proof. If he cannot limit the duration of it neither, then the material world is both infinite and eternal necessarily and independently upon God.

22 and 23. This argument, if it were good, would prove that whatever God can do, he cannot but do ; and consequently that he cannot but make every thing infinite and every thing eternal. Which is making him no governor at all, but a mere necessary agent, that is, indeed no agent at all, but mere fate and nature and necessity.

24–28. Concerning the use of the word, *sensory* ; (though Sir Isaac Newton says only, *as it were the sensory* ;) enough has been said in my Third Reply, § 10 ; and Second Reply, § 3 ; and First Reply, § 3.

29. Space is the place of all things, and of all ideas : just as duration is the duration of all things, and of all ideas. That this has no tendency to make God the soul of the world, see above, Reply II, § 12. There is no union between God and the world. The mind of man might with greater propriety be styled the soul of the images of things which it perceives, than God can be styled the soul of the world, to which he is present throughout, and acts upon it as he pleases, without being acted upon by it.

Though this answer was given before, (Reply II, § 12.) yet the same objection is repeated again and again, without taking any notice of the answer.

30. What is meant by *representative principle*, I understand not. The soul discerns things, by having the images of things conveyed to it through the organs of sense : God discerns things, by being present to and in the substances of the things themselves. Not by producing them continually ; (for he rests now from his work of creation :) but by being continually omnipresent to every thing which he created at the beginning.

31. That the soul should not operate upon the body ; and yet the body, by mere mechanical impulse of matter, conform itself to the will of the soul in all the infinite variety of spontaneous animal-motion ; is a perpetual miracle. *Pre-established harmony*, is a mere word or term of art, and does nothing towards explaining the cause of so miraculous an effect.

32. To suppose that in spontaneous animal-motion, the soul gives no new motion or impression to matter ; but that all spontaneous animal-motion is performed by mechanical impulse of matter ; is reducing all things to mere fate and necessity. God's acting in the world upon every thing, after what manner he pleases, without any union, and without being acted upon by any thing ; shows plainly the difference between an omnipresent governor, and an imaginary soul of the world.

33. Every action is (in the nature of things) the giving of a new force to the thing acted upon. Otherwise 'tis not really action, but mere passiveness ; as in the case of all mechanical and inanimate communications of motion. If therefore the giving a new force, be supernatural ; then every action of God is supernatural and he is quite excluded from the government of the natural world : and every action of man, is either supernatural, or else man is as mere a machine as a clock.

34 and 35. The difference between the true notion of

God, and that of a soul of the world, has been before shown : Reply II, § 12, and in this Paper, § 29 and 32.

36. This has been answered just above, § 31.

37. The soul is not diffused through the brain ; but is present to that particular place, which is the sensorium.

38. This is a bare assertion, without proof. Two bodies, void of elasticity, meeting each other with equal contrary forces, both lose their motion. And Sir Isaac Newton has given a mathematical instance, (p. 341 of the Latin Edition of his *Opticks* [1]), wherein motion is continually diminishing and increasing in quantity, without any communication thereof to other bodies.

39. This is no defect, as is here supposed ; but 'tis the just and proper nature of inert matter.

40. This argument (if it be good,) proves that the material world must be infinite, and that it must have been from eternity, and must continue to eternity : and that God must always have created as many men, and as many of all other things, as 'twas possible for him to create ; and for as long a time also, as it was possible for him to do it.

41. What the meaning of these words is ; *an order*, (or situation,) *which makes bodies to be situable* ; I understand not. It seems to me to amount to this, that situation is the cause of situation. That space is not merely the order of bodies, has been shown before ; and that no answer has been given to the arguments there offered, has been shown in this Paper, § 13 and 14. Also that time is not merely the order of things succeeding each other, is evident ; because the quantity of time may be greater or less, and yet that order continue the same. The order of things succeeding each other in time, is not time itself : for they may succeed each other faster or slower in the same order of succession, but not in the same time. If no creatures existed, yet the ubiquity of God, and the continuance of his existence, would make space and duration to be exactly the same as they are now.

[1] p. 176 below.

42. This is appealing from reason to vulgar opinion ; which philosophers should not do, because it is not the rule of truth.

43. Unusualness is necessarily included in the notion of a miracle. For otherwise there is nothing more wonderful, nor that requires greater power to effect, than some of those things we call natural. Such as, the motions of the heavenly-bodies, the generation and formation of plants and animals etc. Yet these are for this only reason not miracles, because they are common. Nevertheless, it does not follow, that every thing which is unusual, is therefore a miracle. For it may be only the irregular and more rare effect of usual causes : of which kind are eclipses, monstrous births, madness in men, and innumerable things which the vulgar call prodigies.

44. This is a concession of what I alleged. And yet 'tis contrary to the common opinion of divines, to suppose that an angel can work a miracle.

45. That one body should attract another without any intermediate means, is indeed not a miracle, but a contradiction : for 'tis supposing something to act where it is not. But the means by which two bodies attract each other, may be invisible and intangible, and of a different nature from mechanism ; and yet, acting regularly and constantly, may well be called natural ; being much less wonderful than animal-motion, which yet is never called a miracle.

46. If the word *natural forces*, means here mechanical ; then all animals, and even men, are as mere machines as a clock. But if the word does not mean, mechanical forces ; then gravitation may be effected by regular and natural powers, though they be not mechanical.

N.B. The arguments alleged in the postscript to Mr. Leibnitz's fourth paper, have been already answered in the foregoing replies. All that needs here to be observed, is, that his notion concerning the impossibility of physical

atoms, (for the question is not about mathematical atoms) is a manifest absurdity. For either there are, or there are not, any perfectly solid particles of matter. If there are any such; then the parts of such perfectly solid particles, taken of equal figure and dimensions (which is always possible in supposition) are physical atoms perfectly alike. But if there be no such perfectly solid particles, then there is no matter at all in the universe. For, the further the division and subdivision of the parts of any body is carried, before you arrive at parts perfectly solid and without pores; the greater is the proportion of pores to solid matter in that body. If therefore, carrying on the division *in infinitum*, you never arrive at parts perfectly solid and without pores; it will follow that all bodies consist of pores only, without any matter at all: which is a manifest absurdity. And the argument is the same with regard to the matter of which any particular species of bodies is composed, whether its pores be supposed empty, or always full of extraneous matter.[1]

[1] In the 1717 edition of the Correspondence, this sentence is added in the Errata.

MR. LEIBNITZ'S FIFTH PAPER [1]

being

An Answer to Dr. Clarke's Fourth Reply [2]

1. I shall at this time make a larger answer; to clear the difficulties; and to try whether the author be willing to hearken to reason, and to show that he is a lover of truth; or whether he will only cavil, without clearing any thing.

2. He often endeavours to impute to me necessity and fatality; though perhaps no one has better and more fully explained, than I have done in my *Theodicy*, the true difference between liberty, contingency, spontaneity, on the one side; and absolute necessity, chance, coaction, on the other. I know not yet, whether the author does this, because he will do it, whatever I may say; or whether he does it, (supposing him sincere in those imputations,) because he has not yet duly considered my opinions. I shall soon find what I am to think of it, and I shall take my measures accordingly.

3. It is true, that reasons in the mind of a wise being, and motives in any mind whatsoever, do that which answers to the effect produced by weights in a balance. The author objects, that this notion leads to necessity and

[1] Despatched in part with letter dated 18th August 1716 (p. 196).

[2] In the 1717 edition there occurs the following note in French at the beginning of the French version of Leibniz's Fifth Paper: 'The variant readings printed in the margin of the following paper, are changes made in Mr. Leibnitz's own hand in another copy of this paper which he sent to one of his friends in England a short time before his death.' In this edition they have been inserted in the text within square brackets.

For a man never has a sufficient reason to act, when he has not also a sufficient reason to act in a certain particular manner ; every action being individual, and not general, nor abstract from its circumstances, but always needing some particular way of being put in execution Wherefore, when there is a sufficient reason to do any particular thing, there is also a sufficient reason to do it in a certain particular manner ; and consequently, several manners of doing it are not indifferent. As often as a man has sufficient reasons for a single action, he has also sufficient reasons for all its requisites. See also what I shall say below, Numb. 66.

18. These arguments are very obvious ; and 'tis very strange to charge me with advancing my principle of the want of a sufficient reason, without any proof drawn either from the nature of things, or from the divine perfections. For the nature of things requires, that every event should have beforehand its proper conditions, requisites, and dispositions, the existence whereof makes the sufficient reason of such an event.

19. And God's perfection requires, that all his actions should be agreeable to his wisdom ; and that it may not be said of him, that he has acted without reason ; or even that he has prefer'd a weaker reason before a stronger.

20. But I shall speak more largely at the conclusion of this paper, concerning the solidity and importance of this great principle, of the want of a sufficient reason in order to every event ; the overthrowing of which principle, would overthrow the best part of all philosophy. 'Tis therefore very strange that the author should say, I am herein guilty of a *petitio principii* ; and it plainly appears he is desirous to maintain indefensible opinions, since he is reduced to deny that great principle, which is one of the most essential principles of reason.

To Paragraph 3, and 4.

21. It must be confessed, that though this great principle

has been acknowledged, yet it has not been sufficiently made use of. Which is, in great measure, the reason why the *prima philosophia* has not been hitherto so fruitful and demonstrative, as it should have been. I infer from that principle, among other consequences, that there are not in nature two real, absolute beings, indiscernible from each other ; because if there were, God and nature would act without reason, in ordering the one otherwise than the other ; and that therefore God does not produce two pieces of matter perfectly equal and alike. The author answers this conclusion, without confuting the reason of it ; and he answers with a very weak objection. *That argument*, says he, *if it was good, would prove that it would be impossible for God to create any matter at all. For, the perfectly solid parts of matter, if we take them of equal figure and dimensions, (which is always possible in supposition,) would be exactly alike.* But 'tis a manifest *petitio principii* to suppose that perfect likeness which, according to me, cannot be admitted. This supposition of two indiscernibles, such as two pieces of matter perfectly alike, seems indeed to be possible in abstract terms ; but it is not consistent with the order of things, nor with the divine wisdom, by which nothing is admitted without reason. The vulgar fancy such things, because they content themselves with incomplete notions. And this is one of the faults of the atomists.

22. Besides ; I don't admit in matter, parts perfectly solid, or that are the same throughout, without any variety or particular motion in their parts, as the pretended atoms are imagined to be. To suppose such bodies, is another popular opinion ill-grounded. According to my demonstrations, every part of matter is actually subdivided into parts differently moved, and no one of them is perfectly like another.

23. I said, that in sensible things, two, that are indiscernible from each other, can never be found ; that (for instance) two leaves in a garden, or two drops of water, perfectly alike, are not to be found. The author

acknowledges it as to leaves, and perhaps as to drops of water. But he might have admitted it, without any hesitation, without a perhaps, (an Italian would say, *senza forse*,) as to drops of water likewise.

24. I believe that these general observations in things sensible, hold also in proportion in things insensible, and that one may say, in this respect, what Harlequin says in the *Emperor of the Moon*;[1] 'tis there, just as 'tis here. And 'tis a great objection against indiscernibles, that no instance of them is to be found. But the author opposes this consequence, because (says he) sensible bodies are compounded; whereas he maintains there are insensible bodies, which are simple. I answer again, that I don't admit simple bodies. There is nothing simple, in my opinion, but true monads, which have neither parts nor extension. Simple bodies, and even perfectly similar ones, are a consequence of the false hypothesis of a vacuum and of atoms, or of lazy philosophy, which does not sufficiently carry on the analysis of things, and fancies it can attain to the first material elements of nature, because our imagination would be therewith satisfied.

25. When I deny that there are two drops of water perfectly alike, or any two other bodies indiscernible from each other; I don't say, 'tis absolutely impossible to suppose them; but that 'tis a thing contrary to the divine wisdom, and which consequently does not exist.

To Paragraph 5 and 6.

26. I own, that if two things perfectly indiscernible from each other did exist, they would be two; but that supposition is false, and contrary to the grand principle of reason. The vulgar philosophers were mistaken, when they believed that there are things different *solo numero*, or only because they are two; and from this error have

[1] *Arlequin, L'Empereur dans la Lune* was one of the many Harlequinades performed in France in the second half of the seventeenth century. It may have been based on Cyrano de Bergerac's *Voyages dans la Lune*.

arisen their perplexities about what they called the *principle of individuation*. Metaphysics have generally been handled like a science of mere words, like a philosophical dictionary, without entering into the discussion of things. Superficial philosophy, such as is that of the atomists and vacuists, forges things, which superior reasons do not admit. I hope my demonstrations will change the face of philosophy, notwithstanding such weak objections as the author raises here against me.

27. The parts of time or place, considered in themselves, are ideal things; and therefore they perfectly resemble one another like two abstract units. But it is not so with two concrete ones, or with two real times, or two spaces filled up, that is, truly actual.

28. I don't say that two points of space are one and the same point, nor that two instants of time are one and the same instant, as the author seems to charge me with saying. But a man may fancy, for want of knowledge, that there are two different instants, where there is but one: in like manner as I observed in the 17th paragraph of the foregoing answer, that frequently in geometry we suppose two, in order to represent the error of a gainsayer, when there is really but one. If any man should suppose that a right line cuts another in two points; it will be found after all, that those two pretended points must coincide, and make but one point.

29. I have demonstrated, that space is nothing else but an order of the existence of things, observed as existing together;[1] and therefore the fiction of a material finite universe, moving forward[2] 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

[1] 'dans leur simultaneité'.

[2] 'qui se promène tout entier'.

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.

32. Cartesius maintains, that matter is unlimited; and I don't think he has been sufficiently confuted. And though this be granted him, yet it does not follow that matter would be necessary, nor that it would have existed from all eternity; since that unlimited diffusion of matter, would only be an effect of God's choice, judging that to be the better.

To Paragraph 7.

33. Since space in itself is an ideal thing, like time; space out of the world must needs be imaginary, as the schoolmen themselves have acknowledged. The case is the same with empty space within the world; which I take also to be imaginary, for the reasons before alleged.

34. The author objects against me the vacuum discovered by Mr. Guerike [1] of Magdeburg, which is made

[1] Guericke (1602–86). Inventor of the air pump. He is said to have performed an experiment before the Emperor Ferdinand III in which he took two hollow copper hemispheres, exhausted the air from them with his pump, and then showed that thirty horses, fifteen pulling on each hemisphere, could not separate them. Leibniz corresponded with Guericke about the air-pump in 1671–2 (G.I.193).

by pumping the air out of a receiver; and he pretends that there is truly a perfect vacuum, or a space without matter, (at least in part,) in that receiver. The Aristotelians and Cartesians, who do not admit a true vacuum, have said in answer to that experiment of Mr. Guerike, as well as to that of Torricellius [1] of Florence, (who emptied the air out of a glass-tube by the help of quicksilver,) that there is no vacuum at all in the tube or in the receiver; since glass has small pores, which the beams of light, the effluvia of the load-stone, and other very thin fluids may go through. I am of their opinion: and I think the receiver may be compared to a box full of holes in the water, having fish or other gross bodies shut up in it; which being taken out, their place would nevertheless be filled up with water. There is only this difference; that though water be fluid and more yielding than those gross bodies, yet it is as heavy and massive, if not more, than they: whereas the matter which gets into the receiver in the room of the air is much more subtile. The new sticklers for a vacuum allege in answer to this instance, that it is not the grossness of matter, but its mere quantity, that makes resistance; and consequently that there is of necessity more vacuum, where there is less resistance. They add, that the subtleness of matter has nothing to do here; and that the particles of quicksilver are as subtle and fine as those of water; and yet that quicksilver resists about ten times more. To this I reply, that it is not so much the quantity of matter, as its difficulty of giving place, that makes resistance. For instance, floating timber contains less of heavy matter, than an equal bulk of water does; and yet it makes more resistance to a boat, than the water does.

[1] Torricelli (1608–47). Pupil of Galileo, and inventor of the barometer. In his most famous experiment he took a long tube closed at one end, filled it with mercury and closing the open end with his finger, inverted it in a basin of mercury. When he removed his finger, the level of mercury in the tube fell to thirty inches above the surface, leaving an apparent vacuum at the top of the tube.

35. And as for quicksilver ; 'tis true, it contains about fourteen times more of heavy matter, than an equal bulk of water does ; but it does not follow, that it contains fourteen times more matter absolutely. On the contrary, water contains as much matter ; if we include both its own matter, which is heavy ; and the extraneous matter void of heaviness, which passes through its pores. For, both quicksilver and water, are masses of heavy matter, full of pores, through which there passes a great deal of matter void of heaviness [and which makes no sensible resistance] ; such as is probably that of the rays of light, and other insensible fluids ; and especially that which is itself the cause of the gravity of gross bodies, by receding from the centre towards which it drives those bodies. For, it is a strange imagination to make all matter gravitate, and that towards all other matter, as if each body did equally attract every other body according to their masses and distances ; and this by an attraction properly so called, which is not derived from an occult impulse of bodies ; whereas the gravity of sensible bodies towards the centre of the earth, ought to be produced by the motion of some fluid. And the case must be the same with other gravities, such as is that of the planets towards the sun, or towards each other. [A body is never moved naturally, except by another body which touches it and pushes it ; after that it continues until it is prevented by another body which touches it. Any other kind of operation on bodies is either miraculous or imaginary.]

To Paragraphs 8, and 9.

36. I objected, that space taken for something real and absolute without bodies, would be a thing eternal, impassible, and independent upon God. The author endeavours to elude this difficulty, by saying that space is a property of God. In answer to this, I have said, in my foregoing paper, that the property of God is immensity ;

but that space (which is often commensurate with bodies,) and God's immensity, are not the same thing.

37. I objected further, that if space be a property, and infinite space be the immensity of God ; finite space will be the extension or mensurability of something finite. And therefore, the space taken up by a body, will be the extension of that body. Which is an absurdity ; since a body can change space but cannot leave its extension.

38. I asked also ; if space is a property, what thing will an empty limited space, (such as that which my adversary imagines in an exhausted receiver,) be the property of? It does not appear reasonable to say, that this empty space, either round or square, is a property of God. Will it be then perhaps the property of some immaterial, extended, imaginary substances which the author seems to fancy in the imaginary spaces?

39. If space is the property or affection of the substance, which is in space ; the same space will be sometimes the affection of one body, sometimes of another body, sometimes of an immaterial substance, and sometimes perhaps of God himself, when it is void of all other substance material or immaterial. But this is a strange property or affection, which passes from one subject to another. Thus subjects will leave off their accidents, like clothes ; that other subjects may put them on. At this rate, how shall we distinguish accidents and substances?

40. And if limited spaces are the affections of limited substances, which are in them ; and infinite space be a property of God ; a property of God must (which is very strange,) be made up of the affections of creatures ; for all finite spaces, taken together, make up infinite space.

41. But if the author denies, that limited space is an affection of limited things ; it will not be reasonable neither, that infinite space should be the affection or property of an infinite thing. I have suggested all these difficulties in my foregoing paper ; but it does not appear that the author has endeavoured to answer them.

42. I have still other reasons against this strange imagination, that space is a property of God. If it be so, space belongs to the essence of God. But space has parts: therefore there would be parts in the essence of God. *Spectatum admissi.*[1]

43. Moreover, spaces are sometimes empty, and sometimes filled up. Therefore there will be in the essence of God, parts sometimes empty, and sometimes full, and consequently liable to a perpetual change. Bodies, filling up space, would fill up part of God's essence, and would be commensurate with it; and in the supposition of a vacuum, part of God's essence will be within the receiver. Such a God having parts, will very much resemble the Stoics' God, which was the whole universe considered as a divine animal.

44. If infinite space is God's immensity, infinite time will be God's eternity; and therefore we must say, that what is in space, is in God's immensity, and consequently in his essence; and that what is in time, [is in the eternity of God and] is also in the essence of God. Strange expressions; which plainly show, that the author makes a wrong use of terms.

45. I shall give another instance of this. God's immensity makes him actually present in all spaces. But now if God is in space, how can it be said that space is in God, or that it is a property of God? We have often heard that a property is in its subject; but we never heard, that a subject is in its property. In like manner, God exists in all time. How then can time be in God; and how can it be a property of God? These are perpetual *alloglossies.*[2]

46. It appears that the author confounds immensity, or the extension of things, with the space according to which

[1] Spectatum admissi risum teneatis amici, i.e. If you saw such a thing, friends, could you restrain your laughter? Horace, *De Arte Poetica*, I.

[2] 'alloglossies', *ἀλλογλωσσία*: use of a strange tongue (Liddell and Scott).

that extension is taken. Infinite space, is not the immensity of God; finite space, is not the extension of bodies: as time is not their duration. Things keep their extension; but they do not always keep their space. Every thing has its own extension, its own duration; but it has not its own time, and does not keep its own space.

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 :[1] 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

[1] 'au reste'.

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.[1] 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.

To Paragraph 10.

49. It cannot be said that [a certain] duration is eternal but [it can be said] that the things which continue always are eternal, [gaining always a new duration.] Whatever exists of time and of duration, [being successive] perishes continually : and how can a thing exist eternally, which (to speak exactly,) does never exist at all ? For, how can a thing exist, whereof no part does ever exist ? Nothing of time does ever exist, but instants ; and an instant is not

[1] 'au reste'.

even itself a part of time. Whoever considers these observations, will easily apprehend that time can only be an ideal thing. And the analogy between time and space, will easily make it appear, that the one is as merely ideal as the other. [But, if in saying that the duration of a thing is eternal, it is only meant that the thing endures eternally, I have nothing to say against it.]

50. If the reality of space and time, is necessary to the immensity and eternity of God ; if God must be in space ; if being in space, is a property of God ; he will in some measure, depend upon time and space, and stand in need of them. For I have already prevented that subterfuge, that space and time are [in God and like] properties of God. [Could one maintain the opinion that bodies move in the parts of the divine essence ?]

To Paragraph 11, and 12.

51. I objected that space cannot be in God, because it has parts. Hereupon the author seeks another subterfuge, by departing from the received sense of words ; maintaining that space has no parts, because its parts are not separable, and cannot be removed from one another by discerption. But 'tis sufficient that space has parts, whether those parts be separable or not ; and they may be assigned in space, either by the bodies that are in it, or by lines and surfaces that may be drawn and described in it.

To Paragraph 13.

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,[1] one may judge from what has been said that I ought not to admit

[1] 'au reste'.

a moveable universe; nor any place out of the material universe.

To Paragraph 14.

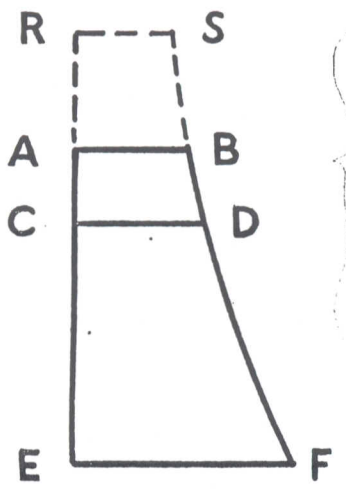
54. I am not sensible of any objection, but what I think I have sufficiently answered. As for the objection that space and time are quantities, or rather things endowed with quantity; and that situation and order are not so: I answer, that order also has its quantity; there is in it, that which goes before, and that which follows; there is distance or interval. Relative things have their quantity, as well as absolute ones. For instance, ratios or proportions in mathematics, have their quantity, and are measured by logarithms; and yet they are relations. And therefore though time and space consist in relations, yet they have their quantity.

To Paragraph 15.

55. As to the question, whether God could have created the world sooner; 'tis necessary here to understand each other rightly. Since I have demonstrated, that time, without things, is nothing else but a mere ideal possibility; 'tis manifest, if any one should say that this same world, which has been actually created, might have been created sooner, without any other change; he would say nothing that is intelligible. For there is no mark or difference, whereby it would be possible to know, that this world was created sooner. And therefore, (as I have already said,) to suppose that God created the same world sooner, is supposing a chimerical thing. 'Tis making time a thing absolute, independent upon God; whereas time does only co-exist with creatures, and is only conceived by the order and quantity of their changes.

56. But yet, absolutely speaking, one may conceive that an universe began sooner, than it actually did. Let us suppose our universe, or any other, to be represented by the Figure A F; and that the ordinate A B represents

its first state ; and the ordinates C D, E F, its following states : I say, one may conceive that such a world began sooner, by conceiving the figure prolonged backwards, and by adding to it S R A B S. For thus, things being increased, time will be also increased. But whether such an augmentation be reasonable and agreeable to God's wisdom, is another question, to which we answer in the negative ; otherwise God would have made such an augmentation. It would be like as



Humano capiti cervicem pictor equinam
Jungere si velit.[1]

The case is the same with respect to the destruction of the universe. As one might conceive something added to the beginning, so one might also conceive something taken off towards the end. But such a retrenching from it, would be also unreasonable.

57. Thus it appears how we are to understand, that God created things at what time he pleased ; for this depends upon the things, which he resolved to create. But things being once resolved upon, together with their relations ; there remains no longer any choice about the time and the place, which of themselves have nothing in them real, nothing that can distinguish them, nothing that is at all discernible.

58. One cannot therefore say, as the author does here, that the wisdom of God may have good reasons to create

[1] 'If a painter wished to join the neck of a horse to a human head . . .' Horace, *De Arte Poetica*, I.

this world at such or such a particular time : that particular time, considered without the things, being an impossible fiction ; and good reasons for a choice, being not to be found, where every thing is indiscernible.

59. When I speak of *this world*, I mean the whole universe of material and immaterial creatures taken together, from the beginning of things. But if any one mean only the beginning of the material world, and suppose immaterial creatures before it; he would have somewhat more reason for his supposition. For time then being marked by things that existed already, it would be no longer indifferent ; and there might be room for choice. And yet indeed, this would be only putting off the difficulty. For, supposing the whole universe of immaterial and material creatures together, to have a beginning ; there is no longer any choice about the time, in which God would place that beginning.

60. And therefore, one must not say, as the author does here, that God created things in what particular space, and at what particular time he pleased. For, all time and all spaces being in themselves perfectly uniform and indiscernible from each other, one of them cannot please more than another.

61. I shall not enlarge here upon my opinion explained elsewhere, that there are no created substances wholly destitute of matter. For I hold with the ancients, and according to reason, that angels or intelligences, and souls separated from a gross body, have always subtile bodies, though they themselves be incorporeal. The vulgar philosophy easily admits all sorts of fictions : mine is more strict.

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.

63. But yet it does not at all follow, that matter is eternal

and necessary ; unless we suppose space to be eternal and necessary : a supposition ill grounded in all respects.

To Paragraph 16 and 17.

64. I think I have answered every thing ; and I have particularly replied to that objection, that space and time have quantity, and that order has none. See above, Number 54.

65. I have clearly shown that the contradiction lies in the hypothesis of the opposite opinion, which looks for a difference where there is none. And it would be a manifest iniquity to infer from thence, that I have acknowledged a contradiction in my own opinion.

To Paragraph 18.

66. Here I find again an argument, which I have overthrown above, Numb. 17. The author says, God may have good reasons to make two cubes perfectly equal and alike : and then (says he) God must needs assign them their places, though every other respect be perfectly equal. But things ought not to be separated from their circumstances. This argument consists in incomplete notions. God's resolutions are never abstract and imperfect : as if God decreed, first, to create the two cubes ; and then, made another decree where to place them. Men, being such limited creatures as they are, may act in this manner. They may resolve upon a thing, and then find themselves perplexed about means, ways, places, and circumstances. But God never takes a resolution about the ends, without resolving at the same time about the means, and all the circumstances. Nay, I have shown in my *Theodicy*, that properly speaking, there is but one decree for the whole universe, whereby God resolved to bring it out of possibility into existence. And therefore God will not choose a cube, without choosing its place at the same time ; and he will never choose among indiscernibles.

67. The parts of space are not determined and dis-

tinguished, but by the things which are in it : and the diversity of things in space, determines God to act differently upon different parts of space. But space without things, has nothing whereby it may be distinguished ; and indeed not any thing actual.

68. If God is resolved to place a certain cube of matter at all, he is also resolved in what particular place to put it. But 'tis with respect to other parts of matter ; and not with respect to bare space itself, in which there is nothing to distinguish it.

69. But wisdom does not allow God to place at the same time two cubes perfectly equal and alike, because there is no way to find any reason for assigning them different places. At this rate, there would be a will without a motive.

70. A will without motive, (such as superficial reasoners suppose to be in God,) I compar'd to Epicurus's chance. The author answers : Epicurus's chance is a blind necessity, and not a choice of will. I reply, that Epicurus's chance is not a necessity, but something indifferent. Epicurus brought it in on purpose to avoid necessity. 'Tis true, chance is blind ; but a will without motive would be no less blind, and no less owing to mere chance.

To Paragraph 19.

71. The author repeats here, what has been already confuted above, Numb. 21 ; that matter cannot be created, without God's choosing among indiscernibles. He would be in the right, if matter consisted of atoms, similar particles, or other the like fictions of superficial philosophy. But that great principle, which proves there is no choice among indiscernibles, destroys also these ill-contrived fictions.

To Paragraph 20.

72. The author objected against me in his Third Paper, (Numb. 7, and 8 ;) that God would not have in himself

a principle of acting, if he was determined by things external. I answered, that the ideas of external things are in him ; and that therefore he is determined by internal reasons, that is, by his wisdom. But the author here will not understand, to what end I said it.

To Paragraph 21.

73. He frequently confounds, in his objections against me, what God will not do, with what he cannot do. See above, Numb. 9 [and below Numb. 76]. For example ; God can do every thing that is possible, but he will do only what is best. And therefore I don't say, as the author here will have it, that God cannot limit the extension of matter ; but 'tis likely [1] he will not do it, and that he has thought it better to set no bounds to matter.

74. From extension to duration, *non valet consequentia.* Though the extension of matter were unlimited, yet it would not follow that its duration would be also unlimited ; nay, even *a parte ante*, it would not follow, that it had no beginning. If it is the nature of things in the whole, to grow uniformly in perfection ; the universe of creatures must have had a beginning. And therefore, there will be reasons to limit the duration of things, even though there were none to limit their extension. Besides, the world's having a beginning, does not derogate from the infinity of its duration *a parte post* ; but bounds of the universe would derogate from the infinity of its extension. And therefore it is more reasonable to admit a beginning of the world, than to admit any bounds of it ; that the character of its infinite author, may be in both respects preserved.

75. However, those who have admitted the eternity of the world, or at least, (as some famous divines have done,) the possibility of its eternity ; did not, for all that, deny its dependence upon God ; as the author here lays to their charge, without any ground.

[1] 'il y a de l'apparence'.

To Paragraph 22 and 23.

76. He here further objects, without any reason, that, according to my opinion, whatever God can do, he must needs have done. As if he was ignorant, that I have solidly confuted this notion in my *Theodicy* ; and that I have overthrown the opinion of those, who maintain that there is nothing possible but what really happens ; as some ancient philosophers did, and among others Diodorus in Cicero.[1] The author confounds moral necessity, which proceeds from the choice of what is best, with absolute necessity : he confounds the will of God, with his power. God can produce every thing that is possible, or whatever does not imply a contradiction ; but he wills only to produce what is the best among things possible. See what has been said above, Numb. 9 [and Numb. 74].

77. God is not therefore a necessary agent in producing creatures, since he acts with choice. However, what the author adds here, is ill-grounded, viz. that a necessary agent would not be an agent at all. He frequently affirms things boldly, and without any ground ; advancing [against me] notions which cannot be proved.

To Paragraph 24–28.

78. The author alleges, it was not affirmed that *space is God's sensorium*, but only *as it were his sensorium.* The latter seems to be as improper, and as little intelligible as the former.

To Paragraph 29.

79. Space is not the place of all things ; for it is not the place of God. Otherwise there would be a thing co-eternal with God, and independent upon him ; nay, he himself would depend upon it, if he has need of place.

80. Nor do I see, how it can be said, that space is the place of ideas ; for ideas are in the understanding.

[1] Cicero, *De Fato.*

loss of force, is only in appearance. The forces are not destroyed, but scattered among the small parts. The bodies do not lose their forces ; but the case here is the same, as when men change great money into small. However, I agree that the quantity of motion does not remain the same ; and herein I approve what Sir Isaac Newton says, page 341 of his *Opticks*,[1] which the author here quotes. But I have shown elsewhere, that there is a difference between the quantity of motion, and the quantity of force.

To Paragraph 39.

100. The author maintained against me, that force does naturally lessen in the material universe ; and that this arises from the dependence of things. (Third Reply, Paragraph 13 and 14.) In my third answer,[a] I desired him to prove that this imperfection is a consequence of the dependence of things. He avoids answering my demand ; by falling upon an incident, and denying this to be an imperfection. But whether it be an imperfection, or not, he should have proved that 'tis a consequence of the dependence of things.

101. However ; that which would make the machine of the world as imperfect, as that of an unskilful watch-maker ; surely must needs be an imperfection.

102. The author says now, that it is a consequence of the inertia of matter. But this also, he will not prove. That inertia, alleged here by him, mentioned by Kepler, repeated by Cartesius [in his letters] and made use of by me in my *Theodicy*, in order to give a notion [and at the same time an example] of the natural imperfection of creatures ; has no other effect, than to make the velocities diminish, when the quantities of matter are increased : but this is without any diminution of the forces.

[a] Which is Mr. Leibnitz's Fourth Paper in this collection [Clarke's note].

[1] p. 176 below.

To Paragraph 40.

103. I maintained, that the dependence of the machine of the world upon its divine author, is rather a reason why there can be no such imperfection in it ; and that the work of God does not want to be set right again ; that it is not liable to be disordered ; and lastly, that it cannot lessen in perfection. Let any one guess now, how the author can hence infer against me, as he does, that, if this be the case, then the material world must be infinite and eternal, without any beginning ; and that God must always have created as many men and other kinds of creatures, as can possibly be created.

To Paragraph 41.

104. I don't say, that space is an order or situation, which makes things capable of being situated : this would be nonsense. Any one needs only consider my own words, and add them to what I said above, (Numb. 47) in order to show how the mind comes to form to itself an idea of space, and yet that there need not be any real and absolute being answering to that idea, distinct from the mind, and from all relations. I don't say therefore, that space is an order or situation, but an order of situations ; or (an order) according to which, situations are disposed ; and that abstract space is that order of situations, when they are conceived as being possible. Space is therefore something [merely][1] ideal. But, it seems, the author will not understand me. I have already, in this paper, (Numb. 54,) answered the objection, that order is not capable of quantity.

105. The author objects here, that time cannot be an order of successive things, because the quantity of time may become greater or less, and yet the order of successions continue the same. I answer ; this is not so. For if the time is greater, there will be more successive and like states

[1] Clarke's addition.

interposed ; and if it be less, there will be fewer ; seeing there is no vacuum, nor condensation, or penetration, (if I may so speak), in times, any more than in places.

106. 'Tis true, the immensity and eternity of God would subsist, though there were no creatures ; but those attributes would have no dependence either on times or places. If there were no creatures, there would be neither time nor place, and consequently no actual space. The immensity of God is independent upon space, as his eternity is independent upon time. These attributes signify only, [with regard to these two orders of things] that God would be present and co-existent with all the things that should exist. And therefore I don't admit what's here alleged, that if God existed alone, there would be time and space as there is now : whereas then, in my opinion, they would be only in the ideas of God as mere possibilities. The immensity and eternity of God, are things more transcendent,[1] than the duration and extension of creatures ; not only with respect to the greatness, but also to the nature of the things. Those divine attributes do not imply the supposition of things [2] extrinsic to God, such as are actual places and times. These truths have been sufficiently acknowledged by divines and philosophers.

To Paragraph 42.

107. I maintained, that an operation of God, by which he should mend the machine of the material world,[a] tending in its nature (as this author pretends) to lose all its motion, would be a miracle. His answer was ; that it would not be a miraculous operation, because it would be usual, and must frequently happen. I reply'd ; that 'tis not usualness or unusualness, that makes a miracle properly

[a] See above, the note on § 13 of Dr. Clarke's Third Reply [Clarke's note].

[1] ' éminent '.

[2] ' n'ont point besoin de choses ', i.e. have no need of things.

so called, or a miracle of the highest sort ; but it is surpassing the powers of creatures ; and this [general][1] is the opinion of divines and philosophers : and that therefore the author acknowledges at least, that the thing he introduces, and I disallow, is, according to the received notion, a miracle of the highest sort, that is, one which surpasses all created powers : and that this is the very thing which all men endeavour to avoid in philosophy. He answers now, that this is appealing from reason to vulgar opinion. But I reply again, that this vulgar opinion, according to which we ought in philosophy to avoid, as much as possible, what surpasses the natures of creatures ; is a very reasonable opinion. Otherwise nothing will be easier than to account for any thing by bringing in the deity, *Deum ex machina*, without minding the natures of things.

108. Besides ; the common opinion of divines, ought not to be looked upon merely as vulgar opinion. A man should have weighty reasons, before he ventures to contradict it ; and I see no such reasons here.

109. The author seems to depart from his own notion, according to which a miracle ought to be unusual ; when, in Paragraph 31, he objects to me, (though without any ground,) that the pre-established harmony would be a perpetual miracle. Here, I say, he seems to depart from his own notion ; unless he had a mind to argue against me *ad hominem*.

To Paragraph 43.

110. If a miracle differs from what is natural only in appearance, and with respect to us ; so that we call that only a miracle, which we seldom see ; there will be no internal real difference, between a miracle and what is natural, and at the bottom, every thing will be either equally natural, or equally miraculous. Will divines like the former, or philosophers the latter ?

[1] Clarke's addition.

To Paragraph 45.

118. I objected, that an attraction, properly so called, or in the scholastic sense, would be an operation at a distance, without any means intervening. The author answers here, that an attraction without any means intervening, would be indeed a contradiction. Very well! But then what does he mean, when he will have the sun to attract the globe of the earth through an empty space? Is it God himself that performs it?[1] But this would be a miracle, if ever there was any. This would surely exceed the powers of creatures.

119. Or, are perhaps some immaterial substances, or some spiritual rays, or some accident without a substance, or some kind of *species intentionalis*, or some other I know not what, the means by which this is pretended to be performed? Of which sort of things, the author seems to have still a good stock in his head, without explaining himself sufficiently.

120. That means of communication (says he) is invisible, intangible, not mechanical. He might as well have added, inexplicable, unintelligible, precarious, groundless, and unexampled.

121. But it is regular, (says the author,) it is constant, and consequently natural. I answer; it cannot be regular, without being reasonable; nor natural, unless it can be explained by the natures of creatures.

122. If the means, which causes an attraction properly so called, be constant, and at the same time inexplicable by the powers of creatures, and yet be true; it must be a perpetual miracle: and if it is not miraculous, it is false. 'Tis a chimerical thing, a scholastic occult quality.

123. The case would be the same, as in a body going round without receding in the tangent, though nothing that can be explained, hindered it from receding. Which is an instance I have already alleged; and the author

[1] 'sert de moyen'.

has not thought fit to answer it, because it shows too clearly the difference between what is truly natural on the one side, and a chimerical occult quality of the schools on the other.

To Paragraph 46.

124. All the natural forces of bodies, are subject to mechanical laws; and all the natural powers of spirits, are subject to moral laws. The former follow the order of efficient causes; and the latter follow the order of final causes. The former operate without liberty, like a watch; the latter operate with liberty, though they exactly agree with that machine,[1] which another cause, free and superior, has adapted to them before-hand. I have already spoken of this, above, No. 92.

125. I shall conclude with what the author objected against me at the beginning of this Fourth Reply: to which I have already given an answer above, (Numb. 18, 19, 20.) But I deferred speaking more fully upon that head, to the conclusion of this paper. He pretended, that I have been guilty of a *petitio principii*. But, of what principle, I beseech you? Would to God, less clear principles had never been laid down. The principle in question, is the principle of the want of a sufficient reason; in order to any thing's existing, in order to any event's happening, in order to any truth's taking place. Is this a principle, that wants to be proved? The author granted it, or pretended to grant it, Numb. 2, of his Third Paper; possibly, because the denial of it would have appeared too unreasonable. But either he has done it only in words, or he contradicts himself, or retracts his concession.

126. I dare say, that without this great principle, one cannot prove the existence of God, nor account for many other important truths.

127. Has not everybody made use of this principle, upon a thousand occasions? 'Tis true, it has been neglected, out of carelessness, on many occasions: but

[1] 'espèce de montre', i.e. sort of watch.

that neglect, has been the true cause of chimeras ; such as are (for instance,) an absolute real time or space, a vacuum, atoms, attraction in the scholastic sense, a physical influence of the soul over the body, [and of the body over the soul] and a thousand other fictions, either derived from erroneous opinions of the ancients, or lately invented by modern philosophers.

128. Was it not upon account of Epicurus's violating this great principle, that the ancients derided his groundless declination of atoms ? And I dare say, the scholastic attraction, revived in our days, and no less derided about thirty years ago, is not at all more reasonable.

129. I have often defied people to allege an instance against that great principle, to bring any one uncontested example wherein it fails. But they have never done it, nor ever will. 'Tis certain, there is an infinite number of instances, wherein it succeeds [or rather it succeeds] in all the known cases in which it has been made use of. From whence one may reasonably judge, that it will succeed also in unknown cases, or in such cases as can only by its means become known : according to the method of experimental philosophy, which proceeds *a posteriori* ; though the principle were not perhaps otherwise justified by bare reason, or *a priori*.

130. To deny this great principle, is likewise to do as Epicurus did ; who was reduced to deny that other great principle, viz. the principle of contradiction ; which is, that every intelligible enunciation must be either true, or false. Chrysippus [1] undertook to prove that principle against Epicurus ; but I think I need not imitate him. I have already said, what is sufficient to justify mine : and I might say something more upon it ; but perhaps it would be too abstruse for this present dispute. And I believe, reasonable and impartial men will grant me, that having

[1] Chrysippus (*c.* 280–206 B.C.), third leader of the Stoic school, and one of the most eminent Greek logicians. The reference here is to Cicero, *De Fato*, X.

forced an adversary to deny that principle, is reducing him *ad absurdum*.

DR. CLARKE'S FIFTH REPLY [1]

As multitudes of words are neither an argument of clear ideas in the writer, nor a proper means of conveying clear notions to the reader ; I shall endeavour to give a distinct answer to this Fifth Paper, as briefly as I can.

1–20. There is no (§ 3) similitude between a balance being moved by weights or impulse, and a mind moving itself, or acting upon the view of certain motives. The difference is, that the one is entirely passive ; which is being subject to absolute necessity : the other not only is acted upon, but acts also ; which is the essence of liberty. To (§ 14) suppose that an equal apparent goodness in different ways of acting, takes away from the mind all power of acting at all, as an equality of weights keeps a balance necessarily at rest ; is denying the mind to have in itself a principle of action ; and is confounding the power of acting, with the impression made upon the mind by the motive, wherein the mind is purely passive. The motive, or thing considered as in view, is something extrinsic to the mind : the impression made upon the mind by that motive, is the perceptive quality, in which the mind is passive : the doing of any thing, upon and after, or in consequence of, that perception ; this is the power of self-motion or action : which in all animate agents, is spontaneity ; and, in moral agents, is what we properly call liberty. The not carefully distinguishing these things, but confounding (§ 15) the motive with the principle of action, and denying the mind to have any principle of action besides the motive, (when indeed in receiving the impression of the motive, the mind is purely passive ;) this, I say,

[1] Transmitted 29th Oct. 1716 (p. 198). Leibniz died 14th Nov. 1716.

is the ground of the whole error ; and leads men to think that the mind is no more active, than a balance would be with the addition of a power of perception : which is wholly taking away the very notion of liberty. A balance pushed on both sides with equal force, or pressed on both sides with equal weights, cannot move at all : and supposing the balance endued with a power of perception, so as to be sensible of its own incapacity to move ; or so as to deceive itself with an imagination that it moves itself, when indeed it is only moved ; it would be exactly in the same state, wherein this learned author supposes a free agent to be in all cases of absolute indifference. But the fallacy plainly lies here : the balance, for want of having in itself a principle or power of action, cannot move at all when the weights are equal : but a free agent, when there appear two, or more, perfectly alike reasonable ways of acting, has still within itself, by virtue of its self-motive principle, a power of acting : and it may have very strong and good reasons, not to forbear acting at all ; when yet there may be no possible reason to determine one particular way of doing the thing, to be better than another. To affirm therefore, (§ 16–19, 69) that supposing two different ways of placing certain particles of matter were equally good and reasonable, God could neither wisely nor possibly place them in either of those ways, for want of a sufficient weight to determine him which way he should choose ; is making God not an active, but a passive being : which is, not to be a God, or governor, at all. And for denying the possibility of the supposition, that there may be two equal parts of matter, which may with equal fitness be transposed in situation ; no other reason can be alleged, but this (§ 20) *petitio principii*, that then this learned writer's notion of a sufficient reason would not be well-grounded. For otherwise, how can any man say, that 'tis (§ 16, 17, 69, 66) impossible for God to have wise and good reasons to create many particles of matter exactly alike in different parts of the universe ? In which case, the parts of space being

alike, 'tis evident there can be no reason, but mere will, for not having originally transposed their situations. And yet even this cannot be reasonably said to be a (§ 16, 69) will without motive ; for as much as the wise reasons God may possibly have to create many particles of matter exactly alike, must consequently be a motive to him to take (what a balance could not do,) one out of two absolutely indifferents ; that is, to place them in one situation, when the transposing of them could not but have been exactly alike good.

Necessity, in philosophical questions, always signifies absolute necessity, (§ 4–13). *Hypothetical necessity*,[a] and *moral necessity*, are only figurative ways of speaking, and in philosophical strictness of truth, are no necessity at all. The question is not, whether a thing must be, when it is supposed that it is, or that it is to be ; (which is hypothetical necessity :) neither is it the question whether it be true that a good being, continuing to be good, cannot do evil ; or a wise being, continuing to be wise, cannot act unwisely ; or a veracious person, continuing to be veracious, cannot tell a lie ; (which is moral necessity :) but the true and only question in philosophy concerning liberty, is, whether the immediate physical cause or principle of action be indeed in him whom we call the agent ; or whether it be some other reason sufficient, which is the real cause of the action, by operating upon the agent, and making him to be, not indeed an agent, but a mere patient.

It may here be observed, by the way ; that this learned author contradicts his own hypothesis, when he says, that (§ 11) the will does not always precisely follow the practical understanding, because it may sometimes find reasons to suspend its resolution. For are not those very reasons, the last judgment of the practical understanding ?

21–25. If it is possible for God to make or to have made two pieces of matter exactly alike, so that the transposing in situation would be perfectly indifferent ; this learned

[a] See my Sermons at Mr. Boyle's Lecture, Part I, p. 106, Edit. 4 [*Works*, II, p. 566].

author's notion of a sufficient reason falls to the ground. To this he answers ; not, (as his argument requires,) that 'tis impossible for God to make two pieces exactly alike ; [a] but, that 'tis not wise for him to do so. But how does he know, it would not be wise for God to do so ? Can he prove that it is not possible God may have wise reasons for creating many parts of matter exactly alike in different parts of the universe ? The only argument he alleges, is that then there would not be a sufficient reason to determine the will of God, which piece should be placed in which situation. But if, for ought that any otherwise appears to the contrary, God may possibly have many wise reasons for creating many pieces exactly alike ; will the indifference alone of the situation of such pieces, make it impossible that he should create, or impossible that it should be wise in him to create them ? I humbly conceive, this is an (§ 20) express begging of the question. To the like argument drawn by me from the absolute indifferency of the original particular determination of motion, no answer has been returned.

26–32. In these articles, there seem to be contained many contradictions. It is allowed (§ 26) that two things exactly alike, would really be two ; and yet it is still alleged, that they would want the *principle of individuation* ; and in Paper 4th, Paragraph 6, it was expressly affirmed, that they would be only the same thing under two names. A (§ 26) supposition is allowed to be possible, and yet I must not be allowed to make the supposition. The (§ 27) parts of time and space are allowed to be exactly alike in themselves, but not so when bodies exist in them. Different co-existent parts of space, and different successive parts of time, are (§ 28) compared to a straight line cutting another straight line in two coincident points, which are but one point only. 'Tis affirmed, that (§ 29) space is nothing but the order of things co-existing ; and yet it is (§ 30) confessed that the material universe may possibly be finite ; in which

[a] See Mr. Leibnitz's Fourth Paper, § 2, 3, 6, 13, 15.

case there must necessarily be an empty extra-mundane space. 'Tis (§ 30, 8, 73) allowed, that God could make the material universe finite : and yet the supposing it to be possibly finite, is styled not only a supposition unreasonable and void of design, but also an (§ 29) impracticable fiction ; and 'tis affirmed, there can be no possible reason which can limit the quantity of matter.[a] 'Tis affirmed, that the motion of the material universe would produce (§ 29) no change at all ; and yet no answer is given to the argument I alleged, that a sudden increase or stoppage of the motion of the whole, would give a sensible shock to all the parts : and 'tis as evident, that a circular motion of the whole, would produce a *vis centrifuga* in all the parts. My argument, that the material world must be moveable, if the whole be finite ; is (§ 31) denied, because the parts of space are immoveable, of which the whole is infinite and necessarily existing. It is affirmed, that motion necessarily implies a (§ 31) relative change of situation in one body, with regard to other bodies : and yet no way is shown to avoid this absurd consequence, that then the mobility of one body depends on the existence of other bodies ; and that any single body existing alone, would be incapable of motion ; or that the parts of a circulating body, (suppose the sun,) would lose the *vis centrifuga* arising from their circular motion, if all the extrinsic matter around them were annihilated. Lastly, 'tis affirmed that the (§ 32) infinity of matter is an effect of the will of God ; and yet Cartesius's notion is (ibid.) approved as irrefragable ; the only foundation of which, all men know to have been this supposition, that matter was infinite necessarily in the nature of things, it being a contradiction to suppose it finite : his words are, *puto implicare contradictionem, ut mundus sit finitus*.[b] Which if it be true, it never was in the power of

[a] Fourth Paper, § 21.

[b] Epist. 69, Partis primae. [*Letter to Henry More*, 15/4/1649, Clerselier, I, 69, Adam & Tannery, V, p. 345, i.e. 'I think it implies a contradiction that the world should be finite.']

God to determine the quantity of matter ; and consequently he neither was the creator of it, nor can destroy it.

And indeed there seems to run a continual inconsistency through the whole of what this learned author writes concerning matter and space. For sometimes he argues against a vacuum (or space void of matter,) as if it was (§ 29, 33–5, 62–3) absolutely impossible in the nature of things ; space and matter being (§ 62) inseparable : and yet frequently he allows the quantity of matter in the universe, to depend upon the (§ 30, 32, 73) will of God.

33–35. To the argument drawn against a plenum of matter, from the want of resistance in certain spaces ; this learned author answers, that those spaces are filled with a matter which has no (§ 35) gravity. But the argument was not drawn from gravity, but from resistance ; which must be proportionable to the quantity of matter, whether the matter had any gravity or no.[a]

To obviate this reply, he alleges that (§ 34) resistance does not arise so much from the quantity of matter, as from its difficulty of giving place. But this allegation is wholly wide of the purpose ; because the question related only to such fluid bodies which have little or no tenacity, as water and quicksilver, whose parts have no other difficulty of giving place, but what arises from the quantity of the matter they contain. The instance of a (ibid.) floating piece of wood, containing less of heavy matter than an equal bulk of water, and yet making greater resistance ; is wonderfully unphilosophical : for an equal bulk of water shut up in a vessel, or frozen into ice, and floating, makes a greater resistance than the floating wood ; the resistance then arising from the whole bulk of the water : but when the water is loose and at liberty in its state of fluidity, the resistance is then not made by the whole, but by part only, of the equal bulk of water ; and then it is no wonder that it seems to make less resistance than the wood.

[a] Otherwise, what makes the body of the earth more difficult to be moved (even the same way that its gravity tends) than the smallest ball?

36–48. These paragraphs do not seem to contain serious arguments, but only represent in an ill light the notion of the immensity or omnipresence of God ; who is not a mere *intelligentia supramundana*, (semota a nostris rebus sejunctaque longe ;) *is not far from every one of us ; for in him we* (and all things) *live and move and have our being.*[a]

The space occupied by a body, is not the (§ 36–7) extension of the body ; but the extended body exists in that space.

There is no such thing in reality, as (§ 38) bounded space ; but only we in our imagination fix our attention upon what part or quantity we please, of that which itself is always and necessarily unbounded.

Space is not an (§ 39) affection of one body, or of another body, or of any finite being ; nor passes from subject to subject ; but is always invariably the immensity of one only and always the same *immensum*.

Finite spaces are not at all the (§ 40) affections of finite substances ; but they are only those parts of infinite space, in which finite substances exist.

If matter was infinite, yet infinite space would no more be an (§ 41) affection of that infinite body, than finite spaces are the affections of finite bodies ; but, in that case, the infinite matter would be, as finite bodies now are, in the infinite space.

Immensity, as well as eternity, is (§ 42) essential to God. The parts of immensity [b] (being totally of a different kind from corporeal, partable, separable, divisible, moveable parts which are the ground of corruptibility ;) do no more hinder immensity from being essentially one, than the parts of duration hinder eternity from being essentially one.

God himself suffers no (§ 43) change at all, by the variety and changeableness of things which live and move and have their being in him.

This (§ 44) strange doctrine, is the express assertion

[a] Acts xvii. 27, 28.

[b] See above in my Third Reply, § 3 ; and Fourth Reply, § 11.

of St. Paul,[a] as well as the plain voice of nature and reason.

God does not exist (§ 45) in space, and in time ; but his existence[b] causes space and time. And when, according to the analogy of vulgar speech, we say that he exists in all space and in all time ; the words mean only that he is omnipresent and eternal, that is, that boundless space and time are necessary consequences of his existence ; and not, that space and time are beings distinct from him, and IN which he exists.

(§ 46) How[1] finite space is not the extension of bodies, I have shown just above, on Paragraph 40. And the two following paragraphs also, (Paragraphs 47 and 48), need only to be compared with what hath been already said.

49–51. These seem to me, to be only a quibbling upon words. Concerning the question about space having parts, see above ; Reply 3, Paragraph 3 ; and Reply 4, Paragraph 11.

52, and 53. My argument here, for the notion of space being really independent upon body, is founded on the possibility of the material universe being finite and moveable : 'tis not enough therefore for this learned writer to reply, that he thinks it would not have been wise and reasonable for God to have made the material universe finite and moveable. He must either affirm, that 'twas impossible for God to make the material world finite and moveable ; or else he must of necessity allow the strength of my argument, drawn from the possibility of the world's being finite and moveable. Neither is it sufficient barely to repeat his assertion, that the motion of a finite material universe would be nothing, and (for want of other bodies to compare it with) would (§ 52) produce no discoverable

[a] Acts xvii. 27, 28.

[b] See above, the note on my Fourth Reply, § 10.

[1] There occurs at this point a long footnote on the nature of space, which in this edition is printed at the end of this paper (p. 120 below).

change : unless he could disprove the instance which I gave of a very great change that would happen ; viz. that the parts would be sensibly shocked by a sudden acceleration, or stopping of the motion of the whole : to which instance, he has not attempted to give any answer.

53. Whether this learned author's being forced here to acknowledge the difference between absolute real motion and relative motion, does not necessarily infer that space is really a quite different thing from the situation or order of bodies ; I leave to the judgment of those who shall be pleased to compare what this learned writer here alleges, with what Sir Isaac Newton has said in his *Principia*, Lib. 1, Defin. 8.[1]

54. I had alleged that time and space were QUANTITIES, which situation and order were not. To this, it is replied ; that *order has its quantity ; there is that which goes before, and that which follows ; there is distance or interval.* I answer : going before, and following, constitutes situation or order : but the distance, interval, or quantity of time or space, wherein one thing follows another, is entirely a distinct thing from the situation or order, and does not constitute any quantity of situation or order : the situation or order may be the same, when the quantity of time or space intervening is very different. This learned author further replies, that ratios or proportions, (§ 54) have their quantity ; and therefore so may time and space, though they be nothing but relations. I answer 1st ; if it had been true, that some particular sorts of relations, such as ratios or proportions were quantities ; yet it would not have followed, that situation and order, which are relations of a quite different kind, would have been quantities too. But 2dly ; proportions are not quantities, but the proportions of quantities. If they were quantities, they would be the quantities of quantities ; which is absurd. Also, if they were quantities, they would (like all other quantities) increase always by addition : but the addition of the proportion of

[1] pp. 150–160 below.

1 to 1, to the proportion of 1 to 1, makes still no more than the proportion of 1 to 1 ; and the addition of the proportion of half to 1, to the proportion of 1 to 1, does not make the proportion of 1 and a half to 1, but the proportion only of half to 1. That which mathematicians sometimes inaccurately call the quantity of proportion, is (accurately and strictly speaking), only the quantity of the relative or comparative magnitude of one thing with regard to another : and proportion is not the comparative magnitude itself, but the comparison or relation of the magnitude to another. The proportion of 6 to 1, with regard to that of 3 to 1, is not a double quantity of proportion, but the proportion of a double quantity. And in general, what they call bearing a greater or less proportion, is not bearing a greater or less quantity of proportion or relation, but, bearing the proportion or relation of a greater or less quantity to another : 'tis not a greater or less quantity of comparison, but the comparison of a greater or less quantity. The (§ 54) logarithmic expression of a proportion, is not (as this learned author styles it) a measure, but only an artificial index or sign of proportion : 'tis not the expressing a quantity of proportion, but barely a denoting the number of times that any proportion is repeated or complicated. The logarithm of the proportion of equality, is 0 ; and yet 'tis as real and as much a proportion, as any other : and when the logarithm is negative, as $\bar{1}$; yet the proportion of which it is the sign or index, is itself affirmative. Duplicate or triplicate proportion, does not denote a double or triple quantity of proportion, but the number of times that the proportion is repeated. The tripling of any magnitude or quantity once, produces a magnitude or quantity, which to the former bears the proportion of 3 to 1. The tripling it a second time, produces (not a double quantity of proportion, but a magnitude or quantity, which to the former bears the proportion (called duplicate) of 9 to 1. The tripling it a third time, produces (not a triple quantity of proportion, but) a

magnitude or quantity, which to the former bears the proportion (called triplicate) of 27 to 1 : and so on. 3dly, time and space are not of the nature of proportions at all, but of the nature of absolute quantities to which proportions belong. As for example : the proportion of 12 to 1, is a much greater proportion, (that is, as I now observed, not a greater quantity of proportion, but the proportion of a greater comparative quantity,) than that of 2 to 1 ; and yet one and the same unvaried quantity, may to one thing bear the proportion of 12 to 1, and to another thing at the same time the proportion of 2 to 1. Thus the space of a day, bears a much greater proportion to an hour, than it does to half a day ; and yet it remains, notwithstanding both the proportions, the same unvaried quantity of time. Time therefore, (and space likewise by the same argument,) is not of the nature of a proportion, but of an absolute and unvaried quantity, to which different proportions belong. Unless this reasoning can be shown to be false, our learned author's opinion still remains, by his own confession,[a] a contradiction.

55–63. All this, seems to me to be a plain contradiction ; and I am willing to leave it to the judgment of the learned. In one paragraph (§ 56), there is a plain and distinct supposition, that the universe might be created as much sooner or later as God pleased. In the rest (§ 55, 57–63), the very terms (sooner or later) are treated as unintelligible terms and impossible suppositions.[b] And the like, concerning the space in which matter subsists ; see above, on Paragraphs 26–32.

64 and 65. See above upon Paragraph 54.

66–70. See above, on Paragraphs 1–20 ; and on Paragraphs 21–25. I shall here only add, that (§ 70) comparing the will of God, when it chooses one out of many equally good ways of acting, to Epicurus's chance, who allowed no will, no intelligence, no active principle at all in the formation of the universe ; is comparing together two

[a] Fourth Paper, § 16. [b] Fourth Paper, § 15.

things, than which no two things can possibly be more different.

71. See above, on Paragraphs 21–25.

72. See above, on Paragraphs 1–20.

73–75. In the consideration whether space be independent upon matter, and whether the material universe can be finite and moveable, (see above, on Paragraphs 1–20, and on 26–32 ;) the question is not concerning the wisdom or (§ 73) will of God, but concerning the absolute and necessary nature of things. If the material universe CAN possibly, by the will of God, be finite and moveable ; (which this learned author here finds himself necessitated to grant, though he perpetually treats it as an impossible supposition ;) then space, (in which that motion is performed,) is manifestly independent upon matter. But if, on the contrary, the material universe cannot be finite and moveable,[a] and space cannot be independent upon matter ; then (I say) it follows evidently, that God neither can nor ever could set bounds to matter ; and consequently the material universe must be not only boundless, but (§ 74) eternal also, both *a parte ante* and *a parte post*, necessarily and independently on the will of God. For, the opinion of those who contend, that the world (§ 75) might possibly be eternal, by the will of God exercising his eternal power ; this has no relation at all, to the matter at present in question.

76 and 77. See above, on Paragraphs 73–75 ; and on Paragraphs 1–20, and below, on Paragraph 103.

78. This paragraph contains no new objection. The aptness and intelligibleness of the similitude made use of by Sir Isaac Newton, and here excepted against, has been abundantly explained in the foregoing Papers.

79–82. All that is objected in the (§ 79, 80) two former of these paragraphs, is a mere quibbling upon words. The existence of God, (as has often been already observed,) causes space ; and in that space, all other things exist. It

[a] Fourth Paper, § 21, and Fifth Paper, § 29.

is therefore (§ 80) the place of ideas likewise ; because it is the place of the substances themselves, in whose understandings ideas exist.

The soul of man being (§ 81) the soul of the images of the things which it perceives, was alleged by me, in way of comparison, as an instance of a ridiculous notion : and this learned writer pleasantly argues against it, as if I had affirmed it to be my own opinion.

God perceives every thing, not (§ 82) by means of any organ, but by being himself actually present everywhere. This everywhere therefore, or universal space, is the place of his perception. The notion of *sensorium*, and of the soul of the world, has been abundantly explained before. 'Tis too much to desire to have the conclusion given up, without bringing any further objection against the premises.

83–88 : and 89–91. That (§ 83) the soul is a *representative principle* ; that (§ 87) *every simple substance is by its nature a concentration and living mirror of the whole universe* ; that (§ 91) *it is a representation of the universe, according to its point of view* ; and that *all simple substances will always have a harmony between themselves, because they always represent the same universe* : all this, I acknowledge, I understand not at all.

Concerning the (§ 83, 87, 89, 90) *harmonia praestabilita*, by which the affections of the soul, and the mechanic motions of the body, are affirmed to agree, without at all influencing each other ; see below, on Paragraphs 110–116.

That the images of things are conveyed by the organs of sense into the sensory, where the soul perceives them ; is affirmed, but not proved, to be an (§ 84) unintelligible notion.

Concerning (§ 84) immaterial substance affecting, or being affected by, material substance ; see below, on Paragraphs 110–116.

That God (§ 85) perceives and knows all things, not by being present to them, but by continually producing them anew ; is a mere fiction of the schoolmen, without any proof.

so long as the quantity of matter continues the same :) but the force here meant, is relative active impulsive force ; which is always proportional to the quantity of relative motion [a] : as is constantly evident in experience ; except where some error has been committed, in not rightly computing and subducting the contrary or impeding force, which arises from the resistance of fluids to bodies moved any way, and from the continual contrary action of gravitation upon bodies thrown upwards.

100–102. That active force, in the sense above-defined, does naturally diminish continually in the material universe ; hath been shown in the last paragraph. That this is no defect, is evident ; because 'tis only a consequence of matter being lifeless, void of motivity, unactive and inert. For the inertia of matter, causeth, not only (as this learned author observes,) that velocity decreases in proportion as quantity of matter increases, (which is indeed no decrease of the quantity of motion ;) but also that solid and perfectly hard bodies, void of elasticity, meeting together with equal and contrary forces, lose their whole motion and active force, (as has been shown above,) and must depend upon some other cause for new motion.

the state 'tis in, either of rest or motion : so that the very same force, which is requisite to give any certain velocity to any certain quantity of matter at rest, is always exactly requisite to reduce the same quantity of matter from the same degree of velocity to a state of rest again. This *vis inertiae* is always proportional to the quantity of matter ; and therefore continues invariably the same, in all possible states of matter, whether at rest or in motion ; and is never transferred from one body to another. Without this *vis*, the least force would give any velocity to the greatest quantity of matter at rest ; and the greatest quantity of matter in any velocity of motion, would be stopped by the least force, without any the least shock at all. So that, properly and indeed, all force in matter either at rest or in motion, all its action and reaction, all impulse and all resistance, is nothing but this *vis inertiae* in different circumstances.

[a] That is ; proportional to the quantity of matter and the velocity ; not (as Mr. Leibnitz affirms, *Acta Erudit.* ad Ann 1695, pag. 156,) to the quantity of matter and the square of the velocity. See above, the Note on Paragraphs 93–95.

103. That none of the things here referred to are defects ; I have largely shown in my former papers. For why was not God at liberty to make a world, that should continue in its present form as long or as short a time as he thought fit, and should then be altered (by such changes as may be very wise and fit, and yet impossible perhaps to be performed by mechanism,) into whatever other form he himself pleased ? Whether my inference from this learned author's affirming [a] that the universe cannot diminish in perfection, that there is no possible reason which can limit the quantity of matter, that God's perfections oblige him to produce always as much matter as he can, and that a finite material universe is an impracticable fiction [b] ; whether (I say) my inferring, that (according to these notions) the world must needs have been both infinite and eternal, be a just inference or no, I am willing to leave to the learned, who shall compare the papers, to judge.

104–106. We are now told, that (§ 104) space is not an order or situation but an order of situations. But still the objection remains ; that an order of situations is not quantity, as space is. He refers therefore to Paragraph 54, where he thinks he has proved that order is a quantity : and I refer to what I have said above in this paper, upon that section ; where I think I have proved, that it is not a quantity. What he alleges concerning (§ 105) time likewise, amounts plainly to the following absurdity : that time is only the order of things successive, and yet is truly a quantity ; because it is, not only the order of things successive, but also the quantity of duration intervening between each of the particulars succeeding in that order. Which is an express contradiction.

To say that (§ 106) *immensity* does not signify boundless space, and that *eternity* does not signify duration or time without beginning and end, is (I think) affirming that words have no meaning. Instead of reasoning upon this

[a] Fourth Paper, § 40, 20, 21, 22, and Fifth Paper, § 29.

[b] See above, Mr. Leibnitz's postscript to his Fourth Paper.

point, we are referred to what certain divines and philosophers (that is, such as were of this learned author's opinion,) have acknowledged : which is not the matter in question.

107–109. I affirmed, that, with regard to God, no one possible thing is more miraculous than another ; and that therefore a miracle does not consist in any difficulty in the nature of the thing to be done, but merely in the unusualness of God's doing it. The terms, *nature*, and *powers of nature*, and *course of nature*, and the like, are nothing but empty words ; and signify merely, that a thing usually or frequently comes to pass. The raising of a human body out of the dust of the earth, we call a miracle ; the generation of a human body in the ordinary way, we call natural ; for no other reason, but because the power of God effects one usually, the other unusually. The sudden stopping of the sun (or earth,) we call a miracle ; the continual motion of the sun (or earth,) we call natural ; for the very same reason only, of the one's being usual and the other unusual. Did man usually arise out of the grave, as corn grows out of seed sown, we should certainly call that also natural ; and did the sun (or earth,) constantly stand still, we should then think that to be natural, and its motion at any time would be miraculous. Against these evident reasons, (*ces* (§ 108) *grandes raisons*) this learned writer offers nothing at all ; but continues barely to refer us to the vulgar forms of speaking of certain philosophers and divines : which (as I before observed) is not the matter in question.

110–116. It is here very surprising, that, in a point of reason and not of authority, we are still again (§ 110) remitted to the opinions of certain philosophers and divines. But, to omit this : what does this learned writer mean by a (§ 110) *real internal difference* between what is miraculous, and not miraculous ; or between (§ 111) operations natural, and not natural ; absolutely, and with regard to God ? Does he think there are in God two different and really distinct principles or powers of acting, and that one thing

is more difficult to God than another ? If not : then either a *natural* and a *super-natural action* of God, are terms whose signification is only relative to us ; we calling an usual effect of God's power, *natural* ; and an unusual one, *super-natural* ; the (§ 112) *force of nature* being, in truth, nothing but an empty word : or else, by the one must be meant that which God does immediately himself ; and by the other, that which he does mediately by the instrumentality of second causes. The former of these distinctions, is what this learned author is here professedly opposing : the latter is what he expressly disclaims, (§ 117) where he allows that angels may work true miracles. And yet besides these two, I think no other distinction can possibly be imagined.

It is very unreasonable to call (§ 113) attraction a miracle, and an unphilosophical term ; after it has been so often distinctly declared [1] that by that term we do not mean to express the cause of bodies tending towards each other, but barely the effect, or the phenomenon itself, and the laws or proportions of that tendency discovered by experience ; whatever be or be not the cause of it. And it seems still more unreasonable, not to admit gravitation or attraction in this sense, in which it is manifestly an actual phenomenon of nature ; and yet at the same time to expect that there should be admitted so strange an hypothesis, as the (§ 109, 92, 87, 89, 90) *harmonia praestabilita* ; which is, that the soul and body of a man have no more influence upon each other's motions and affections, than two clocks, which, at the greatest distance from each other, go alike,

[1] Clarke quotes the following passages in Newton, where it is denied that gravity is regarded as an occult quality.

'How these attractions may be performed, I do not here consider . . . attraction is performed', *Opticks*, Query 31 (p. 174 below).

'These principles I consider not as occult qualities . . . though the causes of these principles were not yet discovered', Query 31 (printed in 1717 version, pp. 179–180 below).

'Hitherto . . . I frame no hypotheses', *Principia*, General Scholium (pp. 169–170 below).

do only what they would do of themselves by mere mechanism ; and why it should be thought that God is under any obligation or confinement either in nature or wisdom, never to bring about any thing in the universe, but what is possible for a corporeal machine to accomplish by mere mechanic laws, after it is once set a going ; I can no way conceive.

117. This learned author's allowing in this place, that there is greater and less in true miracles, and that angels are capable of working some true miracles ; is perfectly contradictory to that notion of the nature of a miracle,[a] which he has all along pleaded for in these papers.

118–123. That the sun attracts the earth, through the intermediate void space ; that is, that the earth and sun gravitate towards each other, or tend (whatever be the cause of that tendency) towards each other, with a force which is in a direct proportion to their masses, or magnitudes and densities together, and in an inverse duplicate proportion of their distances ; and that the space betwixt them is void, that is, hath nothing in it which sensibly resists the motion of bodies passing transversely through : all this, is nothing but a phenomenon, or actual matter of fact, found by experience. That this phenomenon is not produced (§ 118) *sans moyen*, that is without some cause capable of producing such an effect ; is undoubtedly true. Philosophers therefore may search after and discover that cause, if they can ; be it mechanical, or not mechanical. But if they cannot discover the cause ; is therefore the effect itself, the phenomenon, or the matter of fact discovered by experience, (which is all that is meant by the words attraction and gravitation,) ever the less true ? Or is a manifest quality to be called (§ 122) *occult*, because the immediate efficient cause of it (perhaps) is occult, or not yet discovered ? When a body (§ 123) moves in a circle, without flying off in the tangent ; 'tis certain there is something that hinders it : but if in some cases it be not mechanically

[a] See above, Mr. Leibnitz's Third Paper, § 17.

(§ 123) explicable, or be not yet discovered, what that something is ; does it therefore follow, that the phenomenon itself is false ? This is very singular arguing indeed.

124–130. The phenomenon itself, the attraction, gravitation, or tendency of bodies towards each other, (or whatever other name you please to call it by ;) and the laws, or proportions, of that tendency, are now sufficiently known by observations and experiments. If this or any other learned author can by (§ 124) the laws of mechanism explain these phenomena, he will not only not be contradicted, but will moreover have the abundant thanks of the learned world. But, in the mean time, to (§ 128) compare gravitation, (which is a phenomenon or actual matter of fact,) with Epicurus's declination of atoms, (which, according to his corrupt and atheistical perversion of some more ancient and perhaps better philosophy, was an hypothesis or fiction only, and an impossible one too, in a world where no intelligence was supposed to be present ;) seems to be a very extraordinary method of reasoning.

As to the grand principle of a (§ 125) sufficient reason ; all that this learned writer here adds concerning it, is only by way of affirming and not proving, his conclusion ; and therefore needs no answer. I shall only observe, that the phrase is of an equivocal signification ; and may either be so understood, as to mean necessity only, or so as to include likewise will and choice. That in general there (§ 125) is a sufficient reason why every thing is, which is ; is undoubtedly true, and agreed on all hands. But the question is, whether, in some cases, when it may be highly reasonable to act, yet different possible ways of acting may not possibly be equally reasonable ; and whether, in such cases, the bare will of God be not itself a sufficient reason for acting in this or the other particular manner ; and whether in cases where there are the strongest possible reasons altogether on one side, yet in all intelligent and free agents, the principle of action (in which I think the

essence of liberty consists,) be not a distinct thing from the motive or reason which the agent has in his view. All these are constantly denied by this learned writer. And his (§ 20, 25, etc.) laying down his grand principle of a sufficient reason in such a sense as to exclude all these; and expecting it should be granted him in that sense, without proof; this is what I call his *petitio principii*, or begging of the question: than which, nothing can be more unphilosophical.

N.B. Mr. Leibnitz was prevented by death, from returning any answer to this last paper.

[*Footnote to* § 36–48]

The principal occasion or reason of the confusion and inconsistencies, which appear in what most writers have advanced concerning the nature of space, seems to be this: that (unless they attend carefully,) men are very apt to neglect that necessary distinction, (without which there can be no clear reasoning,) which ought always to be made between abstracts and concretes, such as are *immensitas* and *immensum*; and also between ideas and things, such as are the notion (which is within our own mind) of immensity, and the real immensity actually existing without us.

All the conceptions (I think) that ever have been or can be framed concerning space, are these which follow. That it is either absolutely nothing, or a mere idea, or only a relation of one thing to another, or that it is body, or some other substance, or else a property of a substance.

That it is not absolutely nothing, is most evident. For of nothing there is no quantity, no dimensions, no properties. This principle is the first foundation of all science whatsoever; expressing the only difference between what does, and what does not, exist.

That it is not a mere idea, is likewise most manifest. For no idea of space, can possibly be framed larger than finite; and yet reason demonstrates that 'tis a contradiction for space itself not to be actually infinite.

That it is not a bare relation of one thing to another, arising from their situation or order among themselves, is no less apparent: because space is a quantity, which relations (such as situation and order) are not; as I have largely shown below, on Paragraph 54. Also because, if the material universe is, or can possibly be, finite; there cannot but be, actual or possible, extramundane space: see on Paragraphs 31, 52 and 73.

That space is not body, is also most clear. For then body would be necessarily infinite; and no space could be void of resistance to motion. Which is contrary to experience.

That space is not any kind of substance, is no less plain. Because infinite space is *immensitas*, not *immensum*; whereas infinite substance is *immensum* not *immensitas*. Just as duration is not a substance: because infinite duration is *aeternitas*, not *aeternum*; but infinite substance is *aeternum*, not *aeternitas*.

It remains therefore, by necessary consequence, that space is a property, in like manner as duration is. *Immensitas* is τοῦ *immensi*; just as *aeternitas* is τοῦ *aeterni*.

[*Footnote to* § 93–95]

There appears a great confusion and inconsistency in Mr. Leibnitz's whole notion of this matter. For the word, *force*, and *active force*, signifies in the present question, the impetus, or relative impulsive force of bodies in motion: see my Third Reply, Paragraph 13. Mr. Leibnitz constantly uses the word in this sense: as when he speaks (Paragraphs 93, 94, 99, and 107, of this last answer,) of bodies not changing their force after reflexion, because they return with the same swiftness: of a body's receiving a new force from another body, which loses as much of its own: of the impossibility, that one body should acquire any new force, without the loss of as much in others: of the new force which the whole material universe would receive, if the soul of man communicated any force to the body: and of active forces continuing always the same in the universe, because the force which un-elastic bodies lose in their whole, is communicated to and dispersed among their small parts. Now this impetus, or relative impulsive active force of bodies in motion, is evidently both in reason and experience, always proportional to the quantity of motion. Therefore, according to Mr. Leibnitz's principles, this impulsive active force being always the same in quantity, the quantity of motion also must of necessity be always the same in the universe. Yet elsewhere, he consistently acknowledges, (Paragraph 99,) that the quantity of motion is not always the same: and in the *Acta Eruditorum ad Ann.* 1686, pag. 161,[1] he endeavours to prove that the quantity of motion in the universe is not always the same, from that very argument, and from that single argument only, (of the quantity of impulsive force being always the same,) which, if it was true, would necessarily infer on the contrary, that the quantity of motion could not but be always the same. The reason of his inconsistency in this matter, was his computing, by a wonderfully unphilosophical error, the quantity of impulsive force in

[1] G.M. VI, pp. 117–19. *Brevis Demonstratio erroris memorabilis erroris Cartesii . . .*