

Exchange of papers between Leibniz and Clarke

G. W. Leibniz and Samuel Clarke

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[Brackets] enclose editorial explanations. Small ·dots· enclose material that has been added, but can be read as though it were part of the original text. Occasional •bullets, and also indenting of passages that are not quotations, are meant as aids to grasping the structure of a sentence or a thought. Every four-point ellipsis indicates the omission of a brief passage that seems to present more difficulty than it is worth. Longer omissions are described, between [brackets], in normal-sized type.

The first paper is from a letter Leibniz wrote to Caroline, Princess of Wales, who showed it to Samuel Clarke. All the ensuing documents were sent to the princess, who passed them on. In the present version, Clarke's 'this learned author' and Leibniz's 'the author' are replaced by 'Leibniz' and 'Clarke' respectively; and Sir Isaac Newton loses his title. Clarke gave each of his sections the number of the Leibniz section he is replying to. Indications of which Clarke section(s) Leibniz is commenting on are editorial additions except in Leibniz's fifth paper, where he supplied them. Pages of this version are referred to in <angle-brackets>. Clarke first published this 'collection of papers' (not 'correspondence', not 'letters') in 1717, using his own fairly good translations of Leibniz's papers.

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Leibniz's first paper (November 1715)

Natural religion seems to be greatly on the decline in England, where many people hold that human souls are made of matter, and others contend that God himself is a corporeal being, i.e. a body.

2 Locke and his followers aren't sure whether the soul is material and naturally perishable.

3 Newton says that space is an organ—like a sense-organ—by which God senses things. But if God needs an organ to sense things by, it follows that they don't depend entirely on him and weren't produced by him. [Clarke translates Leibniz as speaking of how God 'perceives' things; but the verb Leibniz uses is *sentir*, a cognate of *sens* ('sense'), so that 'sense' seems right. In his 87 on page 43, Leibniz says that this verb shouldn't be used for what God does unless it is purged of its implication of passivity; and it's just a fact about word-usage at that time that the tie between •sensing and •being acted on was much stronger and more obvious than any tie between •perceiving and •being acted on.]

4 Newton and his followers also have a very odd opinion

regarding God's workmanship. According to them,

God's watch—the universe—would stop working if he didn't *re-wind* it from time to time! He didn't have enough foresight to give it perpetual motion. This machine that he has made is so imperfect that from time to time he has to *clean* it by a miraculous intervention, and even has to *mend* it, as a clockmaker mends his work.

The oftener a clockmaker has to adjust his machine and set it right, the clumsier he must be as a clockmaker! In my view, the world always contains the same amount of force and energy, which changes only by passing from one material thing to another in accordance with the laws of nature and the beautiful order that God has pre-established. And I hold that when God works miracles, he does it not to meet the needs of nature but to meet the needs of grace. Anyone who thinks differently must have a very mean notion of the wisdom and power of God.

Clarke's first reply (26 November 1715)

1 Some people in England (and in other countries!) reject natural religion or get it all wrong; that is very true, and much to be lamented. But. . . this is largely due to the false philosophy of the materialists—a philosophy that clashes more directly than any other with the mathematical princi-

ples of philosophy. It's also very true that some people say that the souls of men are bodies, and others say this even about God himself; but those who do so are the great enemies of the mathematical principles of philosophy—principles that prove that matter (or body) is the smallest and most

inconsiderable part of the universe.

2 Locke did write some things implying that he wasn't sure whether the ·human· soul was immaterial or not; but the only people who have followed him in this are some materialists, who are enemies to the mathematical principles of philosophy, and who accept little or nothing from Locke except his errors.

3 Newton doesn't say that space is the organ God uses to perceive things by, or that God needs any medium by which to perceive things. Quite the contrary! His view is that because God is omnipresent—·present everywhere·—he perceives all things just by being ·immediately present to them, i.e. by being exactly where *they* are, wherever in space that might be; and for this he doesn't need the help of an organ (or anything else) to ·mediate between himself and the things he perceives. Trying to make this easier to grasp, Newton illustrates it by a comparison:

The mind of man is immediately present to the pictures or images of things that are formed in the brain by means of the sense-organs, and it ·immediately· sees those pictures.

and similarly:

God is immediately present to all things in the universe, and immediately sees those things.

(Whereas God immediately perceives the things, the human mind perceives the pictures *as if they were* the things.) In the human case, Newton regards the brain and sense-organs as the means by which ·those pictures are formed, *not* as the means by which ·the mind perceives those pictures once they have been formed. And in God's case, Newton doesn't regard things as if they were pictures that had been

formed by certain means or organs; he regards them as real things that God himself ·has formed and ·sees in all the places where they are, without the help of any intermediary. This comparison is all that he means when he supposes infinite space to be (as it were) the *sensorium* of ·God·, the omnipresent being.¹ [In one of its two main meanings, 'sensorium' stood for the part of the brain where sensory images (or their material counterparts or underlays) occur. There was no standard view about *what* part of the brain this was; but it was assumed that there must be one—sensory images had to have their brain counterparts *somewhere*, and 'sensorium' was the name of the appropriate 'somewhere'.]

4 Among humans, the maker of a machine is rightly regarded as skillful in proportion to how long a machine that he has made will work properly without any further tinkering by him. Why? It's because he exercises his skill only in constructing, adjusting, or putting together certain moving parts—such as weights and springs—whose source of motion is a set of forces that are entirely independent of him; he arranges them in various ways, but he didn't *make* them. But with regard to God, the case is quite different: as well as assembling things into structures, he is himself the author and continual preserver of their basic forces or powers of motion. So the fact that nothing happens without his continual regulation and oversight is a ·true glory of his workmanship and not ·something that detracts from it. The idea that the world is a great machine that goes on without intervention by God, like a clock ticking along without help from a clockmaker—that's the idea of *materialism* and *fate*. Under cover of declaring God to be a *supra-mundane intelligence* [= 'a thinking being who is above the world'], it aims to exclude providence and God's government from the world. And the reasoning that will lead

¹ The passage referred to is as follows: 'The sensory [= 'sensorium'] of animals is the place ·in the brain· to which the sensing mind is present, and into which the sensible species of things [roughly = 'whatever it is that perceived things transmit to the sense-organs'] are carried through the nerves and brain, so that they can be perceived there because of their immediate presence to that mind.'

a philosopher to maintain that

From *the beginning of creation*, everything has happened without any regulation or intervention by God, will enable a sceptic to argue back further, maintaining that From *all eternity* things have gone on as they now do, without any real creation or any creator, depending on nothing but an all-wise and eternal 'Nature'.

Suppose a king had a kingdom in which everything continually went on without his regulation or interference—without his attending to and ordering what is done in his realm—it

would be a 'kingdom' only in name, not in reality, and this 'king' wouldn't deserve that title. 'Well, there's no smoke without a fire'! If someone claims that in an earthly government things can go on perfectly well without the king's ordering or dealing with anything, we can reasonably suspect him of wanting to get rid of the king altogether. Similarly, anyone who maintains that the world can continue to run its course without the continual direction of God the supreme governor has a doctrine that does have the effect of excluding God from the world.

Leibniz's second paper

To Clarke's 1 <page 1>

I agree. . . that the principles of the materialists contribute greatly to the spread of impiety. But I see no reason to add that the mathematical principles of philosophy are •opposite to those of the materialists. Really they are •the same, with just this difference:

The materialists who follow Democritus, Epicurus and Hobbes confine themselves altogether to mathematical principles [i.e. to physics, with no admixture of anything else], and hold that nothing exists but bodies; whereas the Christian mathematicians [i.e. Newton and his followers] allow that there are also immaterial substances.

What ought to be set up against materialism, therefore, are not •mathematical principles (taking this phrase in its usual sense) but rather •metaphysical principles. Pythagoras, Plato, and Aristotle had some knowledge of metaphysical

principles, but I claim to have established them in my book *Theodicy*; it is written in an informal manner for the general reader, but my proof is perfectly rigorous. The great foundation of mathematics is the principle of contradiction or identity, i.e. that *a proposition can't be true and false at the same time*, so that A is A and can't be not-A. This principle is all we need to demonstrate every part of arithmetic and geometry, i.e. to demonstrate all mathematical principles. But, as I pointed out in *Theodicy*, the move from mathematics to natural philosophy [here = 'physics'] requires a further principle, namely the principle of the need for a sufficient reason, which says that *for anything that is the case there's a reason why it should be so rather than otherwise*. That is why Archimedes, wanting to move on from mathematics to natural philosophy in his book on equilibrium, had to use a special case of the great principle of sufficient reason. Suppose you have a perfectly symmetrical balance and

that you put equal weights in its two pans. Nothing will move; and Archimedes saw why—it's because *no reason* can be given why one side should go down rather than the other. Using just that one principle—that there has to be a sufficient reason why things should be as they are and not otherwise—we can demonstrate the existence of God and all the rest of metaphysics and natural theology. We can even demonstrate, in a way, principles of natural philosophy that don't depend on mathematics—I mean the dynamic principles, i.e. the principles of force.

2 Clarke goes on to say that according to Newton's physics matter is the most inconsiderable part of the universe.² That is because Newton admits empty space as well as matter, and holds that matter fills up only a very small part of space. But Democritus and Epicurus maintained the same thing, except that they may have believed there to be *more* matter in the world than Newton will allow; and as to that, I think their opinion is preferable to his, because the more matter there is the more opportunity God has to exercise his wisdom and power. And that is just one of several reasons that I have for holding that there is no empty space at all.

To Clarke's 3 <2>

3 In the Appendix to his *Optics* I find Newton saying explicitly that space is the sensorium of God; and 'sensorium' has always signified the organ of sensation. If he and his friends now see fit to mean something different by it, I shan't object.

4 Clarke supposes that the ·mere· *presence* of the soul is sufficient to make it aware of what happens in the brain. [The verb phrase 'to be aware of' translates *s'apercevoir de*. Clarke always translates this by 'perceive', but that is wrong. In these papers Leibniz hardly ever uses *percevoir* = 'perceive', and not once does he speak of

what God perceives. It is always what God 'senses', 'is aware of', or (once) 'discerns'.] But this is just what Malebranche and all the Cartesians deny; and they are right to do so. For x to represent what happens in y, mere *presence* isn't enough; there has to be something that explains what x and y have to do with one another—either •one acts on the other, or •both are acted on by a single cause. ·Of course mere presence isn't enough·. According to Newton, ·a region of· space is intimately *present* to the body that it contains and that has the same shape and size as it does; would he infer from this that space is aware of what happens in a body and remembers it when the body has moved on? ·And when it comes to the presence of *the soul*, the trouble is even worse·. The soul is indivisible; ·it has no size·; so if we try to tell a story about its 'presence' in the body, it could be present only at a point; so how could it be aware of what happens outside that point? I claim to be the first person to show how the soul becomes aware of what happens in the body.

5 The reason why God is aware of everything is not just his •presence but also his •activity; he preserves things by an action that continually produces whatever is good and perfect in them, ·and of course he is aware of what he is doing·. But the correspondence between soul and body can't be ·even partly· explained by their being *present* to each other, because neither of them has any immediate influence over the other.

To Clarke's 4 <2-3>

6 When we commend a machine, that is primarily because of what •it does, not because of what •caused it; and what this reflects in the designer of the machine is his •skill, not his •power. So the reason Clarke gives for praising God's

² Actually, he says that 'mathematical principles' have that consequence, but it's really Newton's system that he is talking about. Mathematical principles, ·properly so-called·, have nothing to say about this.

machine—namely, that he made it entirely, without bringing in any materials from outside—isn't good enough. How *does* God surpass every other machine-maker? Well, Clarke's reason is a *part* of the story: God makes the whole thing, whereas others have to be given materials to work upon; so he surpasses them in power. But God's excellence also has another source, namely his wisdom, which shows in his machine's lasting longer and moving more regularly than machines made by anyone else. When you buy a watch you don't care whether the watchmaker made every part of it himself or got the parts from elsewhere and merely assembled them to make the watch—provided the watch goes right! Even if the workman had a God-given ability to create the matter that the wheels are made of, what you as the buyer of the watch will want to know is whether he had a different God-given ability, namely the gift of assembling the parts to make a watch that runs properly! Similarly, someone looking for reasons to be pleased with God's work will want a better reason than the one that Clarke has produced. His supposed reason is really just a dodge that he was forced into by his refusal to credit God's machine with the absolute regularity that is its chief glory.

7 God's skill has to be infinitely superior to that of a human workman. The mere facts about what he produces do show God's power, but don't adequately convey his wisdom. Those who think otherwise—acknowledging the power but not properly admitting the wisdom of the source of things—will fall into exactly the same error as the materialists and Spinoza, though they try to keep them at arms' length.

8 I'm not saying that the material world is a machine (a watch, say) that runs without God's intervening, and I have pretty strongly insisted that the things he has created need his continual influence. But I do say that the material world

is a watch that runs without needing to be *mended* by God; otherwise we would have to say that God changes his mind! In fact, God has foreseen everything; and for anything that might go wrong he has provided a remedy in advance. There is in his works a harmony, a pre-established beauty.

9 This opinion doesn't exclude God's providence or his government of the world; on the contrary, it makes it perfect. A true divine providence requires perfect foresight—and also provision in advance for any remedies that will turn out to be needed. Otherwise God must be lacking either in the wisdom to foresee things or the power to provide for them in advance. He'll be like the God of the Socinians [fore-runners of the unitarians], who 'takes each day as it comes', as Jurieu says. In fact the Socinians' God doesn't even 'foresee things' going wrong, whereas the Newtonians I am arguing with say only that he doesn't provide against them, and so has to fix them as they occur. Even this strikes me as a great lack; it implies that God is lacking either in power or in good will.

10 I don't see anything wrong with my saying that God is *intelligentia supramundana* [4 on page 2]. Will those who criticize this say that he is *intelligentia mundana* [= 'a thinking being who is in (or of) the world'], i.e. the soul of the world? I hope not! But they had better watch out that they don't carelessly end up in that position.

11 Clarke's example of a kingdom in which everything goes well without the king's getting involved in any way is irrelevant to our present topic; because God continually preserves everything and nothing can exist without him. *His* kingdom is not a kingdom in name only and not in reality! Another example: A king takes care to have his subjects well brought up, providing for their needs so that they keep their abilities and good dispositions—doing this so thoroughly that he

never needs to *fix* anything that has gone wrong. Is *he* 'a king only in name'?

12 A final point: If God has to mend the course of nature from time to time, he must do it either •supernaturally or •naturally. If •supernaturally, this is appealing to miracles in order to explain natural things; and that amounts to

a *reductio ad absurdum* of this hypothesis [i.e. it refutes the hypothesis by showing that something absurd follows from it], for once you let in miracles *anything* can be 'explained' with no trouble at all. And if God's mending is done •naturally, then rather than being *intelligentia supramundana* he is included in the nature of things—i.e. is the soul of the world.

Clarke's second reply (10 January 1716)

1 <page 3> When I said that the mathematical principles of philosophy are opposite to those of the materialists, I meant this contrast:

- Materialists think that the whole order of nature could have arisen from mere mechanical principles of matter and motion, acting •blindly and •inevitably.
- The mathematical principles of philosophy show that, on the contrary, the state of things (the constitution of the sun and planets) must have had a cause that was acting •thoughtfully and •freely.

As for what the principles in question should be called: to the extent that metaphysical consequences follow rigorously from mathematical ones, to that extent one could call the mathematical principles 'metaphysical', if one wanted to.

It is very true that nothing exists without there being a sufficient reason why it exists and why it is *thus* rather than *so*. So where there is no cause, there can be no effect. But often this sufficient reason is simply the will of God. **[NB: Now comes the kick-off for what will be the most famous topic of this exchange.]** For an example, consider

two material things (particles or complexes) that are exactly alike and are ·of course· in different places. Why are they situated as they are rather than the other way around? Why is *x* here and *y* there, rather than *y* here and *x* there? So far as bits of matter are concerned, one place is the same as another, so that if the locations of *x* and *y* had been switched *it would have been exactly the same thing* [the italicised words are exactly Clarke's]. So the only reason there *can* be for the two things to be where they are rather than *vice versa* is the mere will of God. If God couldn't choose without a predetermining cause, any more than a balance can move without an imbalance of weights, this would tend to take away all power of choosing, and to introduce fatality. [We'll find that 'fatality' is a hard word to pin down. It connects with 'fate', whose Latin root connects—as Leibniz will point out later—with 'decree'. Its broad meaning is: the thesis that whatever happens was inevitable, 'fated' to happen.]

2 <4> Many ancient Greeks, who derived their philosophy from the Phoenicians and had it corrupted by Epicurus, did indeed believe in matter and vacuum; but they ·were unlike

Newton in a way that Leibniz doesn't mention, namely they didn't know how put mathematics to work in using those matter-and-vacuum principles to explain the phenomena of nature. As for the question of *how much* matter we should think there is: Even if there isn't much matter, that doesn't reduce God's scope for exercising his wisdom and power, because he can act wisely and powerfully on things other than matter. Re-applying Leibniz's amount-of-matter argument, we could say that there must be infinitely many men (and infinitely many dogs, horses, lions etc.), so as to give God enough scope for the full exercise of his power and wisdom.

3 <4> The word 'sensorium', used properly, refers not to the organ of sensation but to the place of sensation. The eye, the ear etc. are organs, but not sensoria [= plural of sensorium]. Besides, Newton doesn't say that space is the sensorium of God. He merely offers a *comparison*, saying that space is *as it were* the sensorium etc.

4 <4> It was never supposed that the presence of the soul was •sufficient for perception to occur, only that it is •necessary for it. If it weren't present to the images of the things perceived, the soul couldn't possibly perceive them: but being present isn't enough for perception, because only a living substance can have a perception. A present inanimate substance doesn't perceive anything; and a living substance can perceive things only if it is present to •the things themselves (as the omnipresent God is to the whole universe) or present to •the images of the things (as the soul of man is in its own sensorium). Nothing can act or be acted on where it isn't present, just as nothing can exist where it isn't present! The soul's being indivisible doesn't imply that it can be present only at a mere point. Space—finite or infinite—is absolutely indivisible. It isn't even *conceptually*

divisible; to imagine parts of space moving away from one another is to imagine them, as Newton has remarked, moved out of themselves! Yet space is not a mere point.

5 <4> God perceives things, not indeed by •being merely present to them or by •acting on them, but by •being a living, thinking thing as well as an omnipresent one. Similarly with the human soul: it perceives things (vastly fewer than God perceives) by perceiving images of them; and it perceives those not by being merely present to them but by being a living substance. Without being present to them it couldn't perceive them, but (I repeat) mere presence isn't enough.

6 and 7 <5> It's very true that the excellence of God's workmanship consists in its manifesting not only his power but also his wisdom. But what shows his wisdom is his forming at the outset the perfect and complete idea of a work that began and still carries on in conformity with that perfect idea, doing this through the continual uninterrupted exercise of God's power and government. It is *not* shown by his making nature capable of going on without him (like someone making a clock); because that's *impossible*. The powers of a clock's weights and springs don't depend on men, which is why a man can make a clock that will continue to run without him. But there are no powers of nature that are independent of God, which is why nature can't possibly continue to run without *him*.

8 <5> The words 'correction' and 'amendment' are to be understood in the present context in terms of *our* minds, not in terms of *God's*. For example: the present set-up of the solar system, according to the present laws of motion, will in time fall into confusion; and after that it may be 'amended' or put into a new form. But this 'amendment' is relative to our conceptions—in performing it (if he does), God will be taking something that •is confusing us, and making it

•easier for us to understand;
he won't be

taking something that •has gone wrong, and •fixing it.
In reality, and from God's standpoint, the present set-up and the consequent disorder and the ensuing 'amendment' are *all* equally parts of the design embodied in the perfect idea that God had from the outset. •As for longevity: With the whole universe, as with any individual human body, God's wisdom consists not in making it eternal but in making it last as long as he sees fit.

9 <5> God's wisdom and foresight don't consist in his providing from the outset remedies that will automatically cure the disorders of nature. Strictly speaking, from God's standpoint there aren't any disorders, so there aren't any remedies either; nor are there any powers of nature that can do things unaided (as weights and springs work unaided by men). God's wisdom and foresight (I repeat) consist in his forming all at once a design that his power and government is continually carrying out.

10 <5> God is neither a mundane intelligence, nor a supra-mundane intelligence. He is an omnipresent intelligence, both inside the world and outside of it. He is in all, and through all, as well as being above all.

11 <5> •Leibniz agrees that God continually preserves things, but what does that mean? If God's *conserving* •or *preserving*• all things means

his being actually at work preserving and continuing

the beings, powers, orders, dispositions and motions of all things,

—that is all I am arguing for. But if God's conserving things means merely

a king's creating subjects who will be able to act well enough, for ever after, without his interfering or giving them any orders,

—this does indeed make him a real creator, but a 'governor' in name only.

12 <6> Leibniz's argument in this paragraph presupposes that everything that God does is supernatural or miraculous; so what it's aiming at is to exclude all activity by God in governing and ordering the natural world. In fact, though, the distinction between 'natural' and 'supernatural' doesn't exist from God's standpoint; all it marks is a difference between two ways that *we* have of thinking about things. Causing the sun or the earth to move regularly is something we call 'natural': stopping its motion for a day we would call 'supernatural'; but neither of these needs more power than the other, and from God's standpoint neither is more or less natural or supernatural than the other. God's being present in the world, or *to* the world, doesn't make him the soul of the world.³ A soul is part of a compound, the other part being a body, and they 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 on everything and not acted on by anything. He is not far from every one of us, for in him we and all things live and move and have our beings.

³ 'God governs all things, not as a soul of the world but as the lord of the universe. . . "God" is a relative word, carrying in its meaning the idea of *relation to servants*. And God's divinity is his dominion [= "command"]—not like the soul's command over the body, but that of a lord over his servants. . . . In God all things exist and move in him, but without interacting with him: the movements of bodies have no effect on God, and when they move they aren't obstructed by God's omnipresence. . . . He is entirely without body or bodily shape, so he can't be seen or heard or felt; and he ought not to be worshipped through the representation of any physical thing. We have ideas of his •attributes, but we don't know what the •substance is of any thing. . . .' Newton, *Principia*, General Scholium.

Leibniz's third paper (25 February 1716)

To Clarke's 1 <page 6>

1 In the usual sense of the phrase, 'mathematical principles' concern only pure mathematics—i.e. numbers and figures, arithmetic and geometry. Whereas 'metaphysical' principles concern more general notions, such as cause and effect.

2 Clarke 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. This shows that he hasn't properly understood the strength of it. That leads him to use as an example something that exactly fits one of my demonstrations against •real absolute space, •the idol of some modern Englishmen •including Newton and Clarke. (I'm not using 'idol' in a theological way, but in a philosophical sense, following Bacon's thesis that there are idols of the tribe and idols of the cave, •and so on.) [Let's get this clear: Leibniz knows that Clarke follows Newton in •accepting 'real absolute space', says that Clarke's 'Why-are-they- this-way-round?' argument is really part of Leibniz's case •against real absolute space, and offers this as evidence that Clarke doesn't have a proper grasp of the issues.—As for the unexplained phrase 'real absolute space': you'll do best to hold it in mind and let its meaning grow out of the debate surrounding it.]

3 So there we are: these gentlemen maintain that space is a real absolute being, which leads them into great difficulties. •Here is just one. It seems that if there is such a being as real absolute space, it must be eternal and infinite. That's why some people have believed that space is God himself, or one of his attributes—namely the attribute of *immensity*. But space doesn't fit with God, because space has parts.

4 For my part, I have said several times that I hold space to

be something merely relative, as time is, taking space to be an order of coexistences, as time is an order of successions. For space indicates. . . an order of things existing at the same time, considered just as *existing together*, without bringing in any details about what they are like. When we see a number of things together, one becomes aware of this order among them. [Leibniz says that space indicates *en termes de possibilité*—'in terms of possibility'—an order of things etc. Meaning?]

5 As for those who *imagine* that space is a substance, or at least that it is something absolute, I have many demonstrations to show them to be wrong. But just now I'll use only one of these—the one that Clarke has opened the door to •in the section of his paper that I am discussing. The demonstration argues that if space were an absolute being, something would be the case for which there couldn't possibly be a sufficient reason—which conflicts with my axiom, •and thus implies that space is not an absolute being. Here's how the argument goes:

(1) Space is something absolutely uniform; one point of space doesn't differ in any way from any other point of space.

(I mean that it doesn't differ *absolutely*, i.e. apart from differences in what bodies there are at the two places.) Add to that the thesis that I am arguing against:

(2) Space is something in itself, besides the order of bodies among themselves; •i.e. space is absolutely real.

From (1) and (2) it follows that

(3) God could not possibly have had a reason for putting the material universe in space in *this* way •rather than in some other way that retained the same

spatial relations of bodies to one another —e.g. •rather than rotating the world so as to switch west to east. ·That would conflict with the principle of sufficient reason; so it can't happen; so premise (2) is false—Q.e.d.· But if we replace (2) by

(2*) Space is nothing but an order or set of relations among bodies, so that in the absence of bodies space is nothing at all except the possibility of placing them, then we don't get the conclusion (3), because the supposed *two* states—•the universe where it is and •the universe rotated through 180 degrees—are not two states, but one; they are *la même chose*, the same thing. We have the illusion of difference, coming from the fanciful supposition that space is a real independent entity; but in reality the ·supposed· two states are indistinguishable, so they are really *one*; so the question 'Why did God choose this one rather than that?' doesn't arise.

6 The same thing holds for *time*. Suppose someone •asks 'Why didn't God did create everything a year sooner than he did?', •sees that this has no answer, and •infers that God has made a choice where there couldn't possibly be a reason for his choosing that way rather than some other. I say that his inference would be right **if** time was some *thing* distinct from things existing in time ·or events occurring in time·; for in that case it would indeed be impossible for there to be any reason why events shouldn't have occurred in exactly the order they did but at some different time. But what that argument really proves is that times, considered without the things ·or events·, are nothing at all, and that they consist only in the successive order of things ·and events·. On that view of what time is, the supposed 'two states of affairs'—•the world exactly as it is, and •the world as it is except for having started a year sooner —don't differ *at all*, are indiscernible, are really just *one*.

7 It can be seen from all this that Clarke hasn't properly understood my axiom, which he rejects even while seeming to accept it. It's true, he says, that for any state of affairs there is a sufficient reason why it is so rather than otherwise, but he adds that this 'sufficient reason' is often simply the mere will of God. And he gives the example of the world's being located in space as it is rather than as it would be if it were rotated through 180 degrees. But this clearly involves saying that something does happen without any sufficient reason for it, namely *God's making that choice*; which conflicts with the axiom or *general* rule about *everything* that is the case. This involves sliding back into the loose indifference—the tolerance for the idea of choice in the absence of any reason for choosing one way rather than another—·a view that I have abundantly refuted, showing it to be utterly fictional even as applied to creatures, and to be contrary to the wisdom of God because it implies that he could act without acting by reason.

8 Clarke objects against me that if we don't admit this simple and mere will, we deprive God of the power of choosing and bring in a fatality [see note on page 6]. But the exact opposite is true! I maintain that God has the power of choosing, a power that is based on his having, in his wisdom, *reasons* for his choices. This 'fatality' is nothing but the way the universe has been ordered by providence, ·by God·, the wisest being; what has to be avoided is not *that*, but a blind fatality, a necessity that has no wisdom or choice in it.

To Clarke's 2 <6>

9 I had remarked that a lessening of the amount of matter would lessen the quantity of objects that God could exercise his goodness on. Clarke answers that in the space where there's no matter there are other things on which God exercises his goodness. I don't agree, because I hold that

every created substance is accompanied by matter; but let that pass, because even if Clarke were right about that, it wouldn't answer the point I had been making. If there were space that was empty of matter but full of those 'other things', more matter could *also* have been present in that space; and so its *not* being there means a lessening in the number of objects God has to work with. The quip about my implying that there ought to be a greater number of men or animals misses its target, because more men or animals would fill places that could be occupied by other things.

To Clarke's 3 <7>

10 It will be hard to convince me that 'sensorium' in its usual meaning doesn't signify an organ of sensation. See what Goclenius says about the word in his philosophical dictionary. He calls it 'a barbarism used by some scholastics aping the Greeks', and equates it with 'organ of sensation' [Leibniz quotes the passage in Latin].

To Clarke's 4 <7>

11 The mere presence of a substance, even an animated one, is not sufficient for perception. A blind man, and even someone whose thoughts are wandering, doesn't *see*. Clarke should explain how the soul is aware of things outside itself.

To Clarke's 5 <7>

12 God is present to things not by situation but by essence; his presence shows in his immediate operation. [This sentence seems to rest on the idea that God's essence is his power. So the thought is that

•God is present to everything not because *he* is everywhere but because *his essence = power* is everywhere;

which goes with the thought that

•God is present in a place not because he *is* there but because he *acts* there.

We'll see in Clarke's **12** <14> that that's how he understands the passage.] The presence of the soul is something else again. If we

say 'It is spread all through the body', we make it extended and divisible. If we say 'It—the whole of it—is in every part of the body', we divide it from itself. All this talk about 'fixing the soul to a point', 'spreading the soul across many points'—it's just gabble, idols of the tribe!

To Clarke's 6–7 <7>

13 If the universe lost some of its active force by the natural laws God has established, so that later on there was a need for him to give it a shove in order to restore that force (like an artisan repairing his machine), this would involve something's going 'wrong' not only from our standpoint but also from God's. He could have prevented it by having a better plan in the first place—which is of course exactly what he did!

To Clarke's 8 and 9 <7>

14 When I said that God has provided remedies for such disorders in advance, I wasn't saying that God lets the disorders occur and then finds remedies for them, but that he has found a way of preventing any disorders in the first place.

To Clarke's 10 <8>

15 Clarke isn't getting anywhere with his criticism of my statement that God is *intelligentia supramundana*. Saying that God is •above the world isn't denying that he is •in the world.

To Clarke's 11 <8>

16 I never gave any occasion to question that God's conservation is an actual preservation and continuation of the beings, powers, orders, dispositions, and motions of all things, and I think I may have explained this better than many others have. But, says Clarke, 'that is all I am arguing for'.

Well, what a relief! But in fact there is much more than that to our dispute. The questions

- Does God act in the most regular and most perfect manner?
- Could his machine develop a fault that he would have to repair by extraordinary means?
- Can God's will act without reason?
- Is space is an absolute being?
- What are miracles?

and many others like them make a wide difference between us.

To Clarke's 12 <8>

17 Theologians won't agree with Clarke (against me) that from God's standpoint there is no distinction between 'natural' and 'supernatural'; and most philosophers will disagree

with him even more strongly. There is an *infinite* difference between these two, but evidently Clarke hasn't thought hard about this. The supernatural exceeds all the powers of created things. Here's a good example that I have used before: If God wanted to bring this about—

a body moves freely through the ether around a certain fixed centre, without any other created thing acting on it

—I say that this couldn't be done without a miracle, because it can't be explained by the nature of bodies. What a free body moving along a curve would *naturally* do ·at any given moment· is to move away from the curve along the ·straight-line· tangent to it. That's why I contend that the *attraction* of bodies, properly so called, is a miraculous thing—i.e. because it can't be explained by the nature of bodies.

Clarke's third reply (15 May 1716)

1 <page 9> This concerns only the meaning of words. We can accept Leibniz's definitions of 'mathematical' and 'metaphysical'; but ·the fact remains that· mathematical reasonings can be applied to physical and metaphysical subjects.

2 <9> For anything that exists, there is a sufficient reason why it exists, and why it is *thus* rather than *so*—there's no doubt about that.

Clarke writes next: : But in things in their own nature indifferent, mere will, without any thing external to influence it, is alone that sufficient reason.

informally expressed: But when there are two options *neither of which is intrinsically better than the other*, the sufficient reason for someone's choosing option x rather than option y may be just that *he chooses x*, without being caused by anything else to do so.

[The above 'informal expression' serves to explain the word 'indifferent', which here makes its first appearance in this text, and will occur many times hereafter.] An example of this is God's creating or placing a particle of matter in one place rather than in another, when all places are in themselves alike. And this example would still work even if space were not something real but only the

mere order of bodies: for even then, it would be absolutely indifferent, and there could be no reason except mere will, why three equal particles should be placed in the order a–b–c rather than in the contrary order. So this point about the indifferentness of all places doesn't generate an argument showing that no space is real; because two regions of space that are perfectly alike are still •really different or distinct one from another, •even if they are not in themselves real things.

[This paragraph is aimed at Leibniz's **5** <page 9>.] The thesis that space is not a real thing but merely the order of bodies is obviously absurd •in a way that I didn't point out earlier. According to this thesis, if the solar system had been placed **where the remotest fixed stars now are**, with all relationships of order and distance exactly what they are in fact, •this would indeed have been (as Leibniz rightly says) *la même chose*, the same thing in effect; •but it would also imply that the solar system would have been **exactly where it is now**, which is an explicit contradiction. [Leibniz's *la même chose* does indeed mean 'the same thing'. Adding 'in effect' weakens the phrase; that was Clarke's work, with no basis in Leibniz's text.]

[Clarke says that this paragraph responds to something Leibniz said in a private letter (we don't now have it).] The ancients didn't give the label 'imaginary space' to all space that is empty of bodies, but only space that is outside the •material• world. And they didn't mean that such space is not real,⁴ but only that we know nothing of what kinds of things are in it. And if anyone did ever call space 'imaginary', meaning by this that it isn't real, that's no argument that it isn't real!

3 <9> Space is not a *being* •or *thing*•, an eternal and infinite being •or thing•. Rather, it is a property—something that

depends on the existence of a being that is infinite and eternal. Infinite space is immensity. [The term 'immensity', which we will meet often, means 'infinite largeness'. It relates to space as eternity relates to time (if we understand eternity to be existence through an infinitely long stretch of time; not everyone does, because some think of eternity as timeless, but we can see from Clarke's **4** on page 2 that he isn't one of them).] But immensity is not God; so infinite space is not God. As for Leibniz's point about space having parts: there's no problem there, for the following reason. Infinite space is *one*, and is absolutely and essentially indivisible; it's a contradiction to think of it as being *parted*.

what Clarke wrote: because there must be space in the partition itself; which is to suppose it parted and yet not parted at the same time.

what he may have meant: because any partition *of* space₁ would have to take place *in* space₂, meaning that space is (1) parted and yet (2) not parted at the same time.

(See my **4** on page 7) God's immensity or omnipresence doesn't imply that his substance is divisible into parts, any more than his existing through time implies that his existence is divisible into parts. The only problem here arises from misusing the word 'parts' by not giving it its literal meaning.

4 <9> If space was nothing but the order of coexisting things, it would follow that if God moved the entire material world in a straight line, it would remain in the same place; and that however fast he moved it, and however abruptly he stopped it moving, nothing would be jolted. 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, it wouldn't have been created sooner at all. And

⁴ *Nothing* doesn't have any dimensions, magnitudes, quantity, properties. •Space outside the world has all those, so obviously it isn't *nothing*, which is to say that it is real.

another point: space and time are quantities, while situation and order are not.

5, 6 <9> Leibniz argues like this:

Space is uniform, with no part differing from any other. Therefore, if the bodies that were created in place A had been created in place B instead (with the spatial relations amongst them kept the same), then they would still have been created in place A,

which is a manifest contradiction! The uniformity of space does indeed prove that God couldn't have an external reason for creating things in one place rather than in another; but does that stop *his own will* from being in itself a sufficient reason for putting things where he *did* put them, when all places are indifferent or alike, and there is good reason to put things *somewhere*? [Notice that Clarke has here started to expound an argument of Leibniz's and then switched it to one of his own ('which is a manifest contradiction'). He does then answer Leibniz's actual argument (about sufficient reasons), but without having stated it first.]

7, 8 <10> An intelligent and perfectly wise agent will always base his choices on any real differences there are between the options confronting him. But how will such an agent act in a case—like the location-of-matter example we have been discussing—where two ways of acting are equally good? To say that

in such a case •God can't act at all; and •if he *could* act, that would be an imperfection in him, because he wouldn't have any external reason to move him to act in one way rather than the other

seems to deny that God has in himself any *originating* •energy-source or •power of beginning to act, and to maintain

that he always needs (mechanically, as it were) to be pushed into acting •or deciding• by some external cause.

9 <10> I presume that the exact amount of matter that the world now contains is what's best for the present frame of nature, or the present state of things; and that the state of the world would have been less satisfactory if the amount of matter had been greater (or less). So it's not true that having more matter would have provided a greater object for God to exercise his goodness on.

10 <11> The question is not what Goclenius means by 'sensorium', but what Newton means by it. . . . If Goclenius takes the eye or ear or any other organ of sensation to be the sensorium, he is certainly mistaken. But •that's irrelevant to our issue•. When a writer explicitly states what he means by any technical term, what's the point of asking what other meanings other writers may have given it. Scapula in his dictionary translates it as *domicilium*, the place where the mind resides. [Actually, Scapula's entry for *sensorium* reads (in Latin): 'instrument of sensation; sometimes: place where the sense resides'.]

11 <11> The reason why the soul of a blind man doesn't see is that some obstruction prevents images from being conveyed to the sensorium where the soul is present. We don't know *how* the soul of a sighted man sees the images that are present to it; but we are sure that it can't perceive what is not present to it, because nothing can act or be acted upon in a place where it isn't!

12 <11> God, being omnipresent, is really present to everything both essentially and substantially. It's true that his presence at a place shows itself by what he does there, but he can't *act* there unless he *is* there.⁵ The soul is not omnipresent to every part of the body; so it doesn't and can't

⁵ In a footnote Clarke quotes Newton in Latin, which he then translates as: God is omnipresent, not only virtually but substantially; for a power can't exist without a substance •that *has* it•.

itself act directly on every part of the body, but only on the brain and certain nerves and spirits. These influence the whole body, by virtue of laws and causal connections that God has appointed.

13, 14 <11> The fact that the active forces⁶ in the universe grow less and so need new input ·to keep up their level· is not an inconvenience, a disorder, an imperfection in the workmanship of the universe; it's simply a consequence of the nature of dependent things. And the dependency of things is not something that needs to be fixed! The case of a human workman making a machine is quite different, because the powers or forces by which the machine continues to move are entirely independent of the workman.

15 <11> The phrase *intelligentia supramundana* is quite all right when explained in Leibniz's way. But without this explanation the phrase is very likely to lead to the wrong idea that God is not really and substantially present everywhere.

16 <11> Here are my answers to the questions that Leibniz raises in his **16** :

Leibniz: Does God act in the most regular and most perfect manner?

Clarke: Yes.

Leibniz: Could his machine develop a fault that he would have to repair by extraordinary means?

Clarke: There are no faults in anything God makes; and when he chooses to *alter* the way things are going, this is no more 'extraordinary' than his choosing to *keep them going in an unaltered way*.

Leibniz: Can God's will act without reason?

Clarke: As between two options that are in their own nature

absolutely equal and indifferent, God's will can freely choose ·one of them·, determining *itself* and not being acted on by any external cause; and his ability to do this is a perfection in him.

Leibniz: Is space is an absolute being?

Clarke: Space doesn't depend at all on the order or situation or existence of bodies.

Leibniz: What are miracles?

Clarke: See the next section.

17 <12> We haven't been discussing the question of what will be accepted by theologians and philosophers; our topic has been the reasons men give for their opinions! If a miracle is simply •something that *exceeds the power of all created things*, then it doesn't take a miracle for a man to walk on the water, or for the motion of the sun or the earth to be stopped; because none of these things requires *infinite* power to bring it about. As for ·Leibniz's example of· a body in a vacuum circling around a central point: ·there are two cases·. (1) If this is a •usual event (such as the planets moving around the sun), it isn't a miracle—whether God brings it about immediately or indirectly through some invisible created power. (2) If it's an •unusual event (such as a heavy body hanging in the air and moving in a circle), then it is a miracle—whether God brings it about immediately or indirectly through some invisible created power. And a final point: If we are to count as a miracle anything that doesn't arise from (and can't be explained in terms of) the natural powers of body, then every animal motion whatsoever is a miracle. This seems to show conclusively that Leibniz's notion of a miracle is erroneous.

⁶ The phrase 'active force' in this context refers only to •motion and •the impetus or relative impulsive force of bodies that arises from their motion and is proportional to it. That's because the discussion of it that we have been having was prompted by this passage of Newton's: 'It appears that motion may be got or lost. But because of the stickiness of fluids. . . and the weakness of elasticity in solids, motion is much more apt to be lost than got, and is always decreasing. . . . Because the various kinds of motion that we find in the world are always decreasing, there is a need for them to be conserved and augmented by active sources.'

Leibniz's fourth paper (2 June 1716)

To Clarke's 2 <page 12>

1 When two options are absolutely indifferent—meaning that there's nothing to choose between them—there is no choice, and consequently no election or will, since choice must be based on some reason or principle.

2 A simple act of will without any motive ('a mere will') is a fiction. It is •contrary to God's perfection, •chimerical and contradictory, •inconsistent with the definition of *will*, and •sufficiently confuted in my *Theodicy*.

3 Regarding the order in which to place three equal and perfectly alike particles—that's a case of indifferent options, and consequently they will never be placed in any order by God, who does nothing without wisdom—and there couldn't be any *wisdom* in arbitrarily choosing one out of a set of indifferent options. But this doesn't imply that in such cases God is stuck. He is the author of things—all things—and he doesn't ever produce such a thing as three indiscernible particles; so no such thing occurs in nature.

4 There is no such thing as a pair of individuals that are indiscernible from each other. A lively-minded friend of mine, discussing these matters with me in the presence of the Princess Sophia in the garden of Herrenhausen, thought he could find two leaves perfectly alike. The princess challenged him to do it, and he spent ages running all over the garden look for such a pair of leaves—without finding any. Two drops of water or milk will turn out to be distinguishable from each other when viewed with a microscope. This is an argument against atoms, which are driven out—and empty space along with them—by the principles of true metaphysics.

5 The great principles of •sufficient reason and the •identity of indiscernibles change the status of metaphysics. They make metaphysics real and demonstrative, whereas before it didn't amount to much more than empty words.

6 'Suppose x and y are two indiscernible things' comes down to 'Suppose x is y, and that this thing has two names'. What does this imply about the hypothesis that

the universe could right from the outset have had a different spatial and temporal location from what it actually had, with everything else about it—including the spatio-temporal inter-relations among parts of the universe—remaining actually the same?

It implies that the hypothesis is an impossible fiction.

7 The reason why •space outside the world is imaginary is also the reason why •all empty space is an imaginary thing. The only difference between •space that has the world nested within it and •any other stretch of space is that one is bigger than the other.

To Clarke's 3 <13>

8 If space is a property or attribute, it must be the property of some substance. Well, what about the bounded empty space that the friends of empty space say occurs between any two bodies? Of what substance will *that* space be a property?

9 If infinite space •is immensity, finite space will be the opposite to immensity, i.e. will be •measurability, or •limited extension. Now extension must be a property of something extended. But if the finite space we have been talking about is empty, it will be an attribute without a subject, an extension without anything extended. The upshot is that

when Clarke makes space a property, he falls in with my opinion, which makes it an order of things and not anything absolute. [Leibniz is here arguing like this: In saying that space is a •property, Clarke at least firmly rules out space's being a *thing*; but given that there is often nothing for it to be a property *of*, he is left with 'not a thing' and 'not a property', from which he should infer the Leibnizian conclusion 'therefore, a •relation'.]

10 If space is an absolute reality—i.e. a *thing*—it will be even more thing-like (i.e. have more reality) than substances themselves! God can't destroy it, or even change it in any respect. As well as being immense taken as a whole, it will be unchangeable and eternal in every part. There will be an infinity of eternal things besides God.

11 To say that infinite space has no parts is to say •that it isn't made up of finite spaces, and •that infinite space could continue to exist even if finite spaces were reduced to nothing. [He adds a comparison, to highlight the absurdity.]

12 In another of his writings [Leibniz gives the reference] Clarke attributes parts to space; but in his second paper he says they are parts improperly so called—which may be understood in a good sense. [Clarke doesn't say this in his second paper as we have it.]

To Clarke's 4 <14>

13 To say that God can make the whole universe move in a straight line (or any other line!) without changing it in any other way is another fantasy. For two states indiscernible from each other are the same state, so that this 'movement of the entire world along a straight line' is a change that doesn't change anything. Besides, there is neither rhyme nor reason in it; and God does nothing without reason, and it is impossible that there should be any here. . . .

14 These are idols of the tribe [Bacon's phrase, see page 9], mere chimeras, and superficial imaginations. The only basis for

this is the supposition that imaginary space is real.

15 The supposition that God might move the entire world is like the fiction that he might have created the world some millions of years sooner—like it in being impossible! Anyone who buys into fictions of that sort will have to go along with those who argue for the eternity of the world. •Here is why•. God does nothing without reason; no reason can be given why he didn't create the world sooner; so if he has indeed created the world, then he created it before any assignable time—i.e. for *any* time *t*, he created it earlier than *t* because he had no reason not to—•which is to say that the world is eternal. But once it has been shown that the beginning, whenever it was, is always the same thing, that puts an end to the question 'Why didn't it occur earlier?'.

To Clarke's 5, 6 <14>

16 If space and time were anything absolute, i.e. if they were anything but 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 something absolute• is contradictory, i.e. an impossible fiction.

17 This pattern of argument is often used in geometry: we suppose that some figure is greater than it really is, and go on from that to prove that it is *not* greater. This is a contradiction all right, but the contradiction lies in the hypothesis—the initial premise about the size of the figure—which turns out to be false for just that reason. [Just to make sure that this is understood: Leibniz is referring here to the perfectly valid argument-pattern in which one derives not-P from P, this being a proof of not-P. He will use this same argument-form in **22** and **23** on this page, and will comment on it in **28** on page 32]

To Clarke's 7, 8 <14>

18 Because space is uniform, there can't be any *external* or *internal reason* [Leibniz uses the English words] by which to

•distinguish its parts from one another and •choose among them. For any external reason to distinguish them, it would have to be grounded on some internal one; otherwise (·i.e. if we gave some purely external reason for choosing x rather than y·), we would either be discerning something that is indiscernible or be choosing without discerning. A will without reason would be mere Epicurean *chance*. A God who acted by such a will would be a God only in name. Clarke got into these errors through not taking care to avoid everything that detracts from the divine perfections.

19 When two incompatible things are equally good, with neither having any advantage over the other (whether intrinsically or through their combination with other things), God won't produce either of them.

20 God is never determined by external things but always by what is in himself, i.e. by what he knows in advance of anything's existing outside him.

To Clarke's 9 <14>

21 There can't possibly be a reason why the quantity of matter ·in the universe· should be limited; so it can't *be* limited.

22 And if we start with the supposition that the quantity of matter is somehow limited in some arbitrary way: It's always *possible* for more matter to be added to this without lessening the perfection of the things that do already exist; therefore more matter *must always be* added, according to the principle of the perfection of the divine operations; ·which means that our initial supposition of a limited amount of matter must be false·.

23 So it can't be said that the present quantity of matter is the 'best for the present state of things'. Supposing it were: it would follow that this present state or constitution of things wasn't the absolutely best, because it would be blocking God

from using more matter. So it would have been better if he had chosen a different constitution of things, one that was capable of something more, ·namely the existence of more matter. From which it follows that our initial supposition 'There's a finite amount of matter, which is best for the world's actual constitution' must be false·.

To Clarke's 10 <14>

24 I'd like to see a passage from any philosopher who takes 'sensorium' in any other sense than Goclenius does. ·Clarke scolds me for bringing Goclenius into the discussion, but· I was right to cite his *Philosophical Dictionary*, to show how 'sensorium' is usually understood. That's what dictionaries are for.

25 If Scapula says that sensorium is the place where the mind resides, he means by it the organ of internal sensation; so he doesn't differ from Goclenius.

26 'Sensorium' has always signified the organ of sensation. The pineal gland would be, according to Descartes, the sensorium in the sense that Clarke reports Scapula as giving it.

27 Crediting God with having a sensorium is just about the *worst* thing one could say on this subject; it seems to imply that God is the soul of the world. As for what Newton says using this word: it will be hard to find *any* interpretation that justifies it.

28 The question is indeed about Newton's sense for that word, not Goclenius's, Clarke shouldn't criticize me for quoting the *Philosophical Dictionary*, because the design of dictionaries is to show the use of words.

To Clarke's 11, 12 <14>

29 God is aware of things in himself. [This doesn't mean that God is aware of things *that are* in himself; but rather that God's awareness

of things is in some special way internal to him.] Space is the place of things and not the place of God's ideas. To put God's ideas into space, we'd have to regard space as something that unites God with things, along the lines of the union of soul and body that some people believe in; and then we would be back to making God the soul of the world.

30 Clarke also goes wrong when he compares God's knowledge and operation with the knowledge and operation of souls. Souls know things because God has put into them

what Leibniz wrote next: *un principe representatif de ce qui est hors d'elles.*

how Clarke translated that: a principle representative of things without.

what Leibniz was getting at: a generator of representations of things outside them.

But God knows things because he is continually producing them. [Clarke reports difficulty with this passage in his **30** on page 25. Both *principe* and 'principle' could be used to mean 'source' or 'cause' or 'generator', and Clarke had that usage in his own repertoire: see for example 'physical cause or ' near the end of his discussion of Leibniz's **1-20** on page 50.]

31 In my view, all there is to the soul's acting on things is the fact that the body adapts itself to the soul's desires, by virtue of the harmony that God has pre-established between them.

32 But those who fancy that the soul can give a new force to the body, and that God gives new force to the world so as to fix the flaws in his machine, make God too much like the soul by ascribing too much to the soul and too little to God.

33 Actually, God alone can give new force to nature, and he does it only supernaturally. If he needed to do it in the natural course of events, that would be because he had made

a very imperfect work. He would then relate to the world in the way ignorant people think the soul relates to the body.

34 Those who try to defend the vulgar opinion about the soul's influence over the body by citing God's operating on things outside himself are—again!—making God too much like the soul of the world. Clarke's show of disapproval for my phrase *intelligentia supramundana* seems to tend that way.

35 The images that the soul immediately *has* are *within* it, but they •correspond to the images of the body. The soul can be *present* to something only in an imperfect way, which can be explained only in terms of that •correspondence between the soul's images and the bodily images. [The body's 'images' are the items referred to in the note on **3** on page 2 as the 'material counterparts or underlays' of mental images.] But God's way of being present to something is perfect = complete, and is manifested by his operation.

36 It was wrong of Clarke in arguing against me to help himself to the view that the soul's presence in the body is connected with its influence over the body; for he knows that I reject that influence.

37 It's no easier to make sense of the soul's being diffused throughout the •brain than of its being diffused through the •entire body. The difference between those is only one of more and less.

To Clarke's 13, 14 <15>

38 Those who fancy that active forces automatically decrease in the world don't properly understand the chief laws of nature or the beauty of God's works.

39 How are they going to show that this loss-of- force defect is a consequence of the dependence of things? ·I now proceed to show the exact opposite!·

40 When one of our machines is flawed and has to be fixed, the reason this has happened is that the machine *did not* sufficiently depend on the man who made it—i.e. some of the machine's functioning was not sufficiently in accordance with the maker's design. So nature's dependence on God, far from causing the flaw we have been discussing, is the reason why that flaw doesn't occur in nature. It's because nature is so dependent on—so much in accordance with the designs of—a workman who is too perfect to make a work that needed to be mended. Every particular machine *in* nature is somewhat liable to go out of order; but not the entire universe, which can't diminish in perfection.

To Clarke's 16 <15>

41 Clarke contends that space doesn't depend on the situation of bodies. I reply that it's true that space doesn't depend on this or that particular spatial lay-out of bodies, but it is the order that makes it possible for bodies to be situated, and by which they have a lay-out among themselves when they exist together, just as

what Leibniz wrote: *le temps est cet ordre par rapport à leur position successive.*

what that means: time is that order with respect to their successive position.

what he may have been getting at: time is the order that makes it possible for events to have a chronology among themselves when they occur at different times.

If there were no created things, space and time would only be in the ideas of God.

To Clarke's 17 <15>

42 Clarke seems to acknowledge here that his notion of a miracle isn't the one that theologians and philosophers usually have.

what Leibniz wrote next: *Il me suffit donc, que mes adversaires sont obligés de recourir à ce qu'on appelle miracle dans l'usage receu et qu'on tache d'éviter en philosophisant.*

how Clarke translated it: It is therefore sufficient for my purposes that my adversaries are obliged to have recourse to what is commonly called a miracle.

a bit clearer and fuller: I'm satisfied to see that my adversaries have to avail themselves of the ordinary everyday notion of *miracle*—a notion that one tries to avoid in doing science.

[You'll see the point of laying those out in that way when you look at Clarke's extremely odd comment on this in his **42** on page 26. As for 'science': in Leibniz's time 'philosophy' often referred to natural science as well as to what you and I call 'philosophy'; and this is one of the places where that is certainly the case.]

43 By altering the 'philosophically' accepted sense of 'miracle', I'm afraid Clarke will get stuck with an awkward consequence. The nature of a miracle doesn't have anything to do with usualness/unusualness; if it did, then monsters would be miracles. [By 'monster' Leibniz here means 'human or other animal that has from birth physical features making it strikingly and disquietingly unlike most members of its species'.]

44 There are miracles at a lower level, which an angel can perform—e.g. making a man walk on water without sinking. But there are miracles that only God can perform, because they exceed all natural powers. Creating and annihilating are miracles of this kind.

45 It is also a supernatural thing that bodies should attract one another at a distance without any intermediate means, and that a body should circulate without shooting off along a tangent, though nothing hinders it from doing that. For these effects can't be explained by the nature of things.

46 What's the problem about explaining the •motions of animals through natural forces? It is true that the •beginnings

of animals can't be explained in that way, any more than the beginning of the world can.

P.S. All those who maintain that there is empty space are influenced more by imagination than by reason. When I was a boy, I also bought into the notion of the •void [= 'empty space'] and •atoms, with which my imagination had a *lovely* time. Thinking in those terms,

we take our inquiries no further than •those two things; they (as it were) nail our thoughts to them; we think that we have found the first elements of things, the rock bottom. We don't want nature to go any further, wanting it to be finite, like our minds.

But then reason straightened me out, and showed me that this was sheer ignorance of the greatness and majesty of •God•, the author of things. In fact, the tiniest corpuscle is actually subdivided to infinity, and contains a world of further creatures that the universe would lack if that corpuscle were an atom. . . Similarly, to postulate stretches of empty space in nature is to ascribe to God a very imperfect work; it violates the great principle of the necessity for a sufficient reason •for anything that is the case•. Plenty of people have paid lip- service to that principle, but they haven't understood its true meaning; as I recently showed when I used the principle to show •something that those payers of lip-service would never have expected to arise from it, namely• that space is only an order of things, as time also is, and *not* an absolute being. Setting aside many *other* arguments that I have against the void and atoms, I'll present here the ones that I base on **(1)** God's perfection and **(2)** the necessity for a sufficient reason. **(1)** I lay it down as a principle that God has actually given to each thing every perfection that he could

give to it without detracting from its other perfections. Now suppose there is a wholly empty region of space. God could have put matter into it without taking *anything* away from anything else; so he actually *has* put matter in that region. •And that was just some region taken at random; the proof holds for *any* region•; so we have the result that no region of space is completely empty; therefore the whole of space is full. The same argument proves that •there are no atoms, i.e. that• every corpuscle is subdivided. [The argument would go: Suppose there is an atom. God could have made divisions without taking any perfection away from it or anything else; so he *has* done that; so etc.] **(2)** Here is a second argument, based on the need for a sufficient reason. There can't possibly be any principle to settle what *proportion* of space should have matter in it. You might say that the right proportion is *half*, i.e. that there should be exactly as much filled space as empty space; but matter is more perfect than empty space, so reason requires that there should be more matter than vacuum—as much more as matter merits being preferred to vacuum. (•If matter is *much* more perfect than vacuum, there should be *much* more filled space than empty space. If matter is just *a little* more perfect than vacuum, there should be just *a little* more filled space than empty•.) By that reasoning, there should be no empty space at all, because the ratio of •perfection of matter to •perfection of vacuum is the ratio of •something to •nothing. A similar argument holds against atoms: what reason can anyone give what nature should be limited in how finely it is subdivided? •And what principle could lay down *how far down* the subdivision should go?• Atoms and the void are fictions, purely arbitrary and unworthy of true philosophy. The reasons Clarke gives for empty space are mere sophisms.

Clarke's fourth reply (26 June 1716)

1, 2 <page 16> This notion leads to universal necessity and fate, by supposing that motives relate to the will of an intelligent agent in the same way that weights relate to a balance (see Leibniz's **1** on page 4); so that a thinking agent can no more choose between two absolutely indifferent options than a balance can move itself when the weights on both sides are equal. The two are not on a par, because of the following difference between them. •A balance is not an agent, ·i.e. doesn't *act*·, but is merely passive and *acted on* by the weights; so that when the weights are equal there is nothing to move it. But •thinking beings *are* agents; they aren't passive things that are moved by their motives as a balance is moved by weights; rather, they have active powers through which they *move themselves*, sometimes upon the view of strong motives, sometimes upon weak ones, and sometimes where things are absolutely indifferent. [In that sentence, the phrase 'upon the view of' is Clarke's.] Where the options are indifferent, there may still be very good reason to act. Leibniz always supposes the contrary, on principle; but he doesn't prove this, either from the nature of things or from the perfections of God.

3, 4 <16> If this argument were right, it would prove that God did not and could not possibly create any matter at all! For the perfectly solid parts of all matter, if you take them to have the same shapes and sizes (which is always possible in supposition), are exactly alike; in which case it would be perfectly indifferent if any two of them switched locations; and that, according to Leibniz's argument, makes it impossible for God to locate them in the places where he did actually locate them at the creation, because he could as easily have switched their locations. Of course no two

leaves are exactly alike, and perhaps no two drops of water are either; but that's because these are very •complex bodies. The case is very different with the parts of •simple solid matter. And even with complex bodies, it isn't *impossible* for God to make two of them—e.g. two drops of water—exactly alike. And if he *did* make them exactly alike, their likeness wouldn't turn them into a single drop of water! Their locations would be different, even though it was absolutely indifferent which drop was placed in which location. The same reasoning holds regarding the choice between *this way* and *that way* when God was giving the world of matter its initial shove.

5, 6 <16> Two things don't stop being *two* by becoming exactly alike. The parts of •time are as exactly like each other as are the parts of •space; yet two points of time aren't one and the same point of time—'one thing with two names'. If God had created the world *right now*, it wouldn't have been created at the time when it actually was created. And if God did or could make the total bulk of matter finite in size, then the material universe would have to be in its nature movable; for nothing that is finite is immovable. Thus, to say that God couldn't have made a different choice of *when* and *where* matter was to exist is •to make matter necessarily infinite and eternal, and •to reduce all things to necessity and fate.

7 <16> If the material world is finite in size, space outside the world is real, not imaginary. And empty spaces *in* the world aren't merely imaginary either. In a jar from which the air has been pumped, a tiny quantity of matter—rays of light, and perhaps other stuff—still remains, but the lack of resistance plainly shows that most of that space is devoid of matter. The lack of resistance can't be explained by the matter's being

very subtle, i.e. very finely divided: liquid mercury is as finely divided and as fluid as water, yet it creates more than ten times as much resistance as water does; so its resistance must arise from the quantity of matter that is involved, not from the largeness of the matter's parts; which confirms my explanation of why the pumped-out jar offers so little resistance.

8 <16> Any region of empty space is the property of an incorporeal substance—a substance that isn't made of matter. Space is not 'bounded' by bodies, but exists equally within bodies and around them. Space isn't enclosed between bodies; rather, bodies exist in unbounded space and are terminated or bounded by their own dimensions. [Evidently meaning that what 'limits' the size of a material thing is just *its size*.]

9 <16> Empty space is not 'an attribute without a subject', because by the phrase 'empty space' we never mean 'space that is empty of *everything*' but only 'space that is empty of *body*'. In all empty space God is certainly present, and possibly many other substances that aren't matter—ones that can't be felt by touch or detected by any of our other senses.

10 <17> Space is not a substance, but a property; and if it's a property of something that is necessary it will (like any other property of anything necessary) itself exist necessarily; without *being* a substance, it will have a necessity of existence that contingent substances lack. •Space is immense,

unchangeable and eternal; and so also is •duration. But this doesn't at all imply that anything is eternal other than God. For space and duration are not other than or additional to God [Clarke twice uses the French *hors de Dieu*, echoing Leibniz's use of it in his **10** on page 8]; they are caused by his existence—are immediate and necessary consequences of his existence.⁷ And without them he wouldn't be eternal and omnipresent.

11, 12 <17> •Infinites are composed of finites only in the sense in which •finites are composed of infinitesimals. I have already explained, in my **3** on page 13, in what sense space has or doesn't have parts. In the body-related sense of the word, 'parts' are
separable,
compounded,
un-united,
independent of each other, and
movable from each other.

In contrast with that, although we can partly grasp or imaginatively conceive infinite space as composed of parts, those 'parts' (improperly so-called) are essentially

indiscernible from one another,
immovable from one other, and
not capable of being split off,

because the idea of splitting one off from the rest involves an explicit contradiction in terms (see my **4** on page 7, and my **3** on page 13). Thus, space is in itself essentially *one*, and absolutely indivisible.

⁷ 'God is eternal and infinite, omnipotent and omniscient. That is, he lasts from eternity to eternity, and is present from infinity to infinity. He governs everything that exists, and knows everything that it is possible to know. He is not eternity or infinity, but is eternal and infinite. He isn't duration or space, but he . . . endures through all time and is present through all space; and by existing always and everywhere he establishes duration and space. [Newton writes *constituit*, which Clarke translates as "constitutes", but Newton is using that word in its now obsolete sense of "establishes" or "sets up".] Since every particle of space is *always*, and every indivisible moment of duration is *everywhere*, the maker and lord of all things cannot be never and nowhere. . . . His omnipresence isn't just a matter of his *power's* being everywhere; a power can't exist without substance •that *has it*•; so he himself is everywhere.' Newton, *Principia*, General scholium.

13 <17> If the world is finite in size, it can be moved by the power of God; so my argument based on that movableness is conclusive. Two exactly alike places are not the same place. Nor are the universe's being in motion and its staying at rest the same state. If a ship is sailing smoothly enough, a man shut up in the cabin can't tell whether it is moving or not; but that doesn't alter the fact that its *moving* and its *not moving* are not the same state! Whether or not the locked-up man can detect it, the motion of the ship is a real state with real effects (a different state and different effects from motionlessness); and if the ship suddenly stopped, that would yield other real effects; as would a sudden stopping of an indiscernible motion of the universe. No answer to this argument has ever been given ·from Leibniz's side·. Newton emphasizes this at length in his *Mathematical Principles*, (Definition 8) where

from the consideration of the properties, causes, and effects of motion, he shows the difference between •real motion (a body's being moved from one part of space to another) and •relative motion (bodies merely undergoing a change of the order or situation they have with respect to one other).

This argument is a mathematical one. It shows from real effects that there may be real motion in the absence of relative motion, and relative motion in the absence of real motion. It isn't answered by simply *asserting* the contrary.

14 <17> The reality of space is not a 'supposition', but is proved by the above arguments, to which no answer has been given. Nor is any answer given to my other argument—in **4** on page 14.—that space and time are *quantities*, which situation and order are not.

15 <17> It wasn't impossible for God to have made the world sooner or later than he actually did; and it's not at all

impossible for him to destroy it sooner or later than he actually will. As for the notion of the world's eternity: those who suppose matter and space to be the same must indeed suppose that not only *is* the world infinite and eternal but it necessarily *must* be so; just as necessarily as space and duration, which depend not on the will but on the existence of God. [Leibniz, as he will say in his **62** on page 40, doesn't 'suppose matter and space to be the same'. This sentence of Clarke's seems to be a side-swipe at Descartes: someone who combines •Descartes's view that matter is the same as space with •Clarke's own view about the nature of space and the necessity of its existence will be forced to the conclusion that the material world exists necessarily.] But there is no problem here for those who believe that God created as much matter as he pleased, and where and when he pleased. For God in his wisdom may have had very good reasons for creating this world at the particular time that he chose; and he may have created other kinds of things before this material world began, and may create yet further kinds of things after this world is destroyed.

16, 17 <17> In my **4** on page 13 and my **13** on this page, I have shown that space and time are not the mere order of things, but are real quantities (which order and situation are not). Leibniz hasn't answered those proofs. Until he does so, his assertion—which he says 'would be a contradiction' if I were right—has to be regarded as indeed being a contradiction.

18 <18> The uniformity of all the parts of space isn't an argument against God's acting in any part in any way he likes. God may have good reasons to create finite beings, and finite beings have to be in particular places. All places are basically alike (and would be so even if place were nothing but the situation of bodies); so when God places two indistinguishable cubes of matter *this* way rather than *that*, the two options are perfectly equal; but that doesn't

mean that it is unworthy of the perfections of God that he should choose one of them. There may be very good reasons why both the cubes should exist, and they can't exist except placed *this way* or *that*. Also, Leibniz's statement that 'A will without reason would be mere Epicurean *chance*' is wrong. Epicurean chance is not a choice of will, but a blind necessity of fate.

19 <18> This argument (as I observed in my **3–4** on page 22), if it proves anything, proves that God didn't *and can't* create any matter at all. The options of different initial locations for equal and exactly alike parts of matter would have to be indifferent; as was also the first-shove determination of their motions—*this way* or *the opposite way*.

20 <18> I don't see what this has to do with anything we have been arguing about.

21 <18> 'God cannot set limits to how much matter there is'—that is too weighty an assertion to be accepted without proof. If he also can't limit how long matter lasts, then the material world is both infinite and eternal necessarily and independently of God.

22, 23 <18> If this argument were sound, it would prove that anything that God *can* do is something that he *must* do—can't help doing; so that he can't help making everything infinite and everything eternal. That would mean that he isn't a governor at all, but a mere necessary agent, i.e. not really an agent at all but mere fate and nature and necessity.

24–28 <18–18> Concerning the use of the word *sensorium* [this time Clarke uses the English 'sensory'], I have already said enough in my **10** on page 11, my **3** on page 7, and my **3** on page 1 (but bear in mind that Newton says only '*... as it were* the sensorium. . .').

29 <18> Space is the place of all things and of all ideas; just as duration is the duration of all things and of all ideas. This

has no tendency to make God the soul of the world—see my **12** on page 8 [Clarke might also have referred to his **12** on page 15.] There is no union between God and the world. It would be more proper to call the mind of man 'the soul of the images of things that it perceives' than to call God 'the soul of the world'—the world to which he is present throughout, acting on it as he pleases without being acted on by it. I gave this answer in my **12** on page 14, but Leibniz repeats the same objection again and again, without taking any notice of my answer.

30 <25> I don't know what is meant by 'representative principle' [see note in **30** on page 19]. The soul discerns things by •having the images of them conveyed to it through the sense-organs; God discerns things by •being present to and in the substances of the things. *Not* by •producing them continually (for he is now resting from his work of creation), but by •being continually omnipresent to everything that he created at the beginning.

31 <19> Leibniz holds that

- the soul doesn't act on the body;
- the body moves purely in accord with the laws of impact-mechanics; and yet
- the body's movements conform to the will of the soul in all the infinite variety of spontaneous animal motion.

That is a perpetual miracle! 'Pre-established harmony' is just a phrase, an invented technical term. It doesn't help in the slightest to explain this miraculous effect.

32 <19> To suppose that in spontaneous animal motion the soul has no *effect* on matter, and that all spontaneous animal motion is performed through impact-mechanics, is to reduce everything to mere fate and necessity. God acts on everything in the world, in any way he likes, without any 'union' and

without being acted on by anything—all that shows plainly the difference between an omnipresent governor and an imaginary soul of the world.

33 <19> In the nature of things, every action is the giving of a new force to the thing that is acted on. Otherwise it's not really •action but mere •passiveness; which is the case in all mechanical and inanimate passings-on of motion. [The thought here is that when any inanimate thing x makes something else y move, all x does is to pass on to y some motion which *came to it from something else*. In inanimate systems motion is never *originated*.] If the giving of a new force is supernatural, then every one of God's actions is supernatural, and he has no role in the workings of the natural world. And it follows also that either •every human action is supernatural (•because it creates new force•) or •man is as much a mere machine as a clock is (•because he never creates new force•).

34, 35 <19> I have already shown the difference between •the true notion of God and •the notion of a soul of the world. See my **12** on page 11 and my **29** and **32** just above.

36 <19> This has been answered in my **31** above.

37 <19> The soul is not 'diffused throughout the brain'. It is present in one particular place, the sensorium.

38 <19> This is a bare assertion, without proof. When two perfectly inelastic bodies meet in a head-on collision in which their forces are equal, they both lose their motion. And Newton has given a mathematical example in which the amount of motion is continually falling and rising, without any of it being passed on to other bodies (*Optics*, near end of Query 31).

39 <19> This loss of force is not a 'defect', as Leibniz here supposes. It is the just and proper nature of inert matter.

40 <20> If this argument is sound, it proves that •the material world must be infinite, •that it must have existed from

eternity and must continue to eternity, and •that God must always have created as many men, and as many things of every other kind, as it was possible for him to create, and to have gone on doing this for as long a time as it was possible for him to do it. [This item seems irrelevant to Leibniz's **40** on page 20; it is closer to fitting his **23** on page 18. See Leibniz's puzzled comment on it in his **103** on page 45.]

41 <20> I don't understand the words *the order* (or situation) *that makes it possible for bodies to be situated*. It seems to amount to saying that *situation is the cause of situation*. [Leibniz had written only of 'the order which ' etc.; the insertion of '(or situation)' was Clarke's.] As I point out in my **13** and **14** two pages back, it has been *shown* that space is not merely the order of bodies, and Leibniz has not *answered* this. Also, it is obvious that time is not merely the order of things succeeding each other, because the •quantity of time may be greater or less while the •order of events remains the same. . . . If there were no created things, space and duration would be exactly the same as they are in actuality—God's ubiquity [= 'everywhereness'] and the continuance of his existence would see to that.

42 <20> This is appealing from reason to vulgar opinion, which philosophers should not do, because it is not the rule of truth. [Leibniz in his **107** on page 46 thinks Clarke is referring to the 'vulgar opinion' that the ordinary concept of miracle shouldn't be used in science. He, of course, couldn't know that Clarke in translating what he had written would *omit* the mention of how science should be done.]

43 <20> The concept of *miracle* does include *unusualness*. Think of things we count as 'natural' although they are absolutely wonderful and manifest enormous amounts of power—things like the movements of the heavenly bodies, and the generation and formation of plants and animals etc. Astounding as these are, they aren't miracles, simply

because they are common, usual. But it doesn't follow that everything *unusual* is a miracle. It might instead be only an irregular and rarer effect of *usual* causes—for example, eclipses, monstrous births [see note to **43** on page 20], madness in men, and countless other things that the vulgar call prodigies.

44 <20> This concedes what I claimed; though it's contrary to the common theological opinion to suppose that an angel can perform a miracle.

45 <20> That one body should attract another ·from a distance· without any intermediate means—indeed this isn't a •miracle because it's •a contradiction! That's because it supposes something to *act* where it *is* not. But the means by which two bodies attract each other may be invisible and intangible, quite different from *mechanism*, and yet be something that acts so regularly and constantly that we can call it 'natural'—it's much less wonderful than animal motion, though that is never called a miracle. [In these remarks of Clarke's and in Leibniz's response to them in his **118** on page 48, *moyen* = 'means' is apparently being used in two senses at once. •There is no *how* concerning the attraction they are talking about, no *means* by which it is brought about; it just happens. But the absence of a *moyen* is also •the absence of any *intervening link* between the mutually attracting bodies.]

46 <20> If this is about forces that are 'natural' in the sense of being 'mechanical', then Leibniz is implying that all animals, all men even, are mere machines—as much so as a clock. But if 'natural' doesn't mean 'mechanical', then gravitation may be brought about by forces that are regular and natural

without being mechanical. [Here and throughout, 'mechanical' and its cognates refer to the physics of *collisions*—impact-mechanics.]

N.B. <21> The arguments offered in the postscript to Leibniz's fourth paper have been already answered in my replies above. All I need add here is that his view about the impossibility of atoms (*physical* atoms, that is; we aren't arguing about mathematical atoms) is an obvious absurdity. Either •there are perfectly solid particles of matter or •there are not. •If there are, then there's nothing conceptually wrong with supposing that they have parts that are all of the same size and shape; and those parts would be physical atoms that were perfectly alike. But •if there aren't any such perfectly solid particles, then there's no matter at all in the universe. Here is why:

When you divide and subdivide the parts of a body, trying to get down to the level where there are perfectly solid parts with no pores in them, the longer it takes you to reach that level the greater is the proportion of pores to solid matter in that body. ·That's because at each level you will have a mixture of pores and matter, and at each stage the matter you've reached is *itself* a mixture of pores and matter, which. . . etc.· So if your division-and-subdivision goes on to infinity without your *ever* arriving at parts that are perfectly solid, i.e. contain no pores, it will follow that all bodies consist of pores only, without any matter at all; which is plainly absurd.

And the same pattern of argument applies with regard to the matter of which the bodies of any particular species are composed.

Leibniz's fifth paper (18 August 1716)

To Clarke's 1 and 2 <page 22>

1 This time around, I'll give my answers more fully and broadly, so as to clear away the difficulties. I'm trying to find out whether Clarke is willing to listen to reason, and to show that he is a lover of truth; or whether he will only pick holes in what I am saying, without throwing light on anything.

2 He often goes out of his way to impute to me necessity and fatality; though in my *Theodicy* I have explained—perhaps better and more fully than anyone else—the true difference between

liberty, contingency, spontaneity,
on the one side; and

absolute necessity, chance, compulsion,
on the other. I still don't know whether Clarke does this •because he is determined to hang this charge on me, whatever I say; or whether he does it sincerely, which means that he does it •because he hasn't yet thought hard enough about my views. I'll soon discover what I should think about this, and will act accordingly.

3 It is *true* that reasons in the mind of a wise being, and motives in any mind whatsoever, work in a way that corresponds to the effect produced by weights in a balance. Clarke objects that this notion leads to necessity and fatality. But he says it without proving it, and without paying any attention to the explanations I have given at other times [presumably meaning 'in some of my earlier publications'], in order to remove any difficulties arising about this.

4 He seems also to play with ambiguous terms. There are necessities that ought to be admitted. ·To get straight about this· we must distinguish between •absolute necessity and

•hypothetical necessity. We must also distinguish between •the necessity something has because its opposite implies a contradiction (called 'logical', 'metaphysical', or 'mathematical' necessity) and •the moral necessity that is at work when a wise being chooses the best and when any mind follows its strongest inclination.

5 Hypothetical necessity is what future contingent truths have—they get it from God's •foresight and •pre-ordination, considered as an hypothesis or presupposition (·which why it is called 'hypothetical'·). We have to admit this kind of necessity unless we follow the Socinians in denying that God has any •foreknowledge of future contingents, and denying that •his providence regulates and governs every particular thing.

6 But neither God's foreknowledge nor his pre-ordination take anything away from liberty. For God is moved by his supreme reason to choose, out of many •series of things or •possible worlds, the one in which free creatures would make such and such decisions, ·making them *freely*· though not without his concurrence [= 'deciding freely, but with God going along with the decision']. In this way he has made every outcome certain and determined, without thereby taking anything away from the freedom of those creatures: God saw the free natures of his creatures in his ideas of them, and his simple decree of choice merely actualises their free natures—it doesn't alter them.

7 As for moral necessity: this doesn't detract from freedom either. For when a wise being chooses what is best, and especially when God, the supremely wise being, chooses what is best, that choice doesn't make him any less free. On the contrary, •not being hindered from acting in the best manner

is •the most perfect freedom! And when a more ordinary person chooses on the basis of what good is most evident to him and inclines him most strongly, he is imitating—more or less closely, depending on his character—the freedom of a truly wise being •choosing what is actually the best•. Without this, the choice would be blind chance.

8 But true or apparent good—i.e. the motive—*inclines* without *necessitating*, i.e. without making it absolutely necessary for the person to act as he does. Take the case of God, for instance: when he chooses the best, the less perfect options that he doesn't choose are nevertheless *possible*. If his choice were absolutely necessary, any alternative *would* be impossible—which contradicts the fundamental idea that God chooses among possibles, i.e. among many options none of which implies a contradiction.

9 But the inference *God can't NOT choose what is best; so anything that he doesn't choose is impossible* is just a case of conceptual muddle, confusing

- power with will,
- metaphysical necessity with moral necessity,
- essences with existences.

For anything that is necessary is so because of its essence, since its opposite is self-contradictory; but a contingent thing that exists owes its existence to the principle of what is best [i.e. the principle that God always chooses what is best], which is a sufficient reason for the existence of things. That is why I say that motives incline without necessitating; and that contingent things involve certainty and infallibility but not absolute necessity. More about this in **73** and **76** on page 41.

10 And I have shown well enough in my *Theodicy* that this moral necessity is a good thing, which fits God's perfection, and fits the great **principle of existences**, namely the need for a sufficient reason; whereas absolute or metaphysical

necessity depends upon the other great principle of our reasonings, namely the **principle of essences**, i.e. the principle of identity or contradiction—for what is absolutely necessary is the only possible option, and its contrary is self-contradictory.

11 I have also shown that our will doesn't always exactly follow the practical understanding, because it may have or find reasons to delay a decision until it has had time for more thought.

12 It will be an unreasonable obstinacy on Clarke's part if, after all this, he still attributes to me the notion of an absolute necessity, without having anything to say against the reasons I have just been offering, reasons that get to the bottom of things, perhaps more than anyone else has done.

13 As for the notion of *fate*, which Clarke also accuses me of •being committed to•, this is another case of ambiguity. There is Moslem fate, Stoic fate, and Christian fate. Turkish fate implies that such-and-such *will happen* even if its cause is avoided, as though it were absolutely necessary. Stoic fate will tell a man to stay calm, patiently putting up with the course of events because he knows that he can't resist it. But it is agreed [by Clarke?] that there is Christian fate, a certain destiny that everything has, regulated by the foreknowledge and providence of God. 'Fate' is derived from •the Latin• *fari* = 'to pronounce', 'to decree'; and in its proper sense it signifies God's decree •about what is to happen•. [That is true of the English word 'fate', which is what Clarke has used, and also of the French word that Leibniz uses.] And those who submit to Christian fate through a knowledge of God's perfections. . . have more than just Stoic •patience, but also are •contented with what God ordains because they know that he does everything for the best—for the greatest good in general and the greatest particular good of those who love him.

14 I have had to go on at length in order to remove ill-grounded accusations once for all; and I hope my explanations *will* remove them from the minds of fair-minded people. I now come to Clarke's objection to my comparing the weights of a balance with the motives of the will. He objects that a balance is merely •passive, and moved by the weights; whereas thinking agents that have *will* are •active. To this I answer that the principle of *the need for a sufficient reason* is common both to things that act and things that are passively acted on: they need a sufficient reason for their acting as well as for their being acted on. It's not just that •the balance doesn't act when it is equally pulled on both sides, but also •the equal weights don't act when they are in an equilibrium so that neither can go down unless the other rises by the same amount.

15 It should also be taken into account that strictly speaking motives don't *act on* the mind in the way weights act on a balance. What really happens is that the mind acts by virtue of its •motives, which are its •dispositions to act. And so to claim as Clarke does here that the mind sometimes prefers weak motives to strong ones, and even that it sometimes gives its preference to something that is indifferent, putting that ahead of any motives—this is to *divide the mind from the motives*, as though •they were outside the mind and distinct from it as the weights are distinct from the balance, and as though •the mind had, as well as motives, *other* dispositions to act, by virtue of which it could reject or accept the motives. Whereas in fact the motives include *all* the dispositions that the mind can have to act voluntarily—not only its •reasons, but also any •inclinations it has because of passions or other preceding impressions. Therefore, if the mind preferred a weak inclination to a strong one it would be acting against itself, acting otherwise than it is disposed to act! Which shows that the notions that Clarke opposes to mine are

superficial; when one thinks them through, they seem to have no solidity in them.

16 Clarke says here that the mind can have 'good reasons' to act when it has no motives and when the options are absolutely 'indifferent'! This is an obvious contradiction; for if the mind has 'good reasons' for the option that it selects, then the options are not 'indifferent' to it.

17 And to say that the mind will act when it has reasons to act, even if the ways of acting are absolutely indifferent—this is to speak again very superficially and quite indefensibly. For you don't have a sufficient reason to act unless you have a sufficient reason to act in precisely such-and-such a way; for every action is a •particular ·event·—not something general, something abstracted from its circumstances; and action always needs some *particular way* of being carried out. So when there's a sufficient reason to do any particular thing, there's also a sufficient reason to do it in a certain particular way, which means that the various alternative ways of doing it are not indifferent. . . . See also my **66** on page 40.

18 These arguments are utterly obvious; and it's very strange to accuse me of presenting my principle of the need for a sufficient reason without any proof drawn either from •the nature of things or from •God's perfections. For •the nature of things requires every event to be preceded by its proper conditions, requirements, and dispositions— all of which add up to the sufficient reason for the event.

19 And •God's perfection requires that all his actions be suitable to his wisdom, and that he can never be reproached for acting without reason or even for preferring a weaker reason to a stronger one.

20 At the end of this paper [page 49] I'll have more to say about the solidity and importance of this great principle

of the need for a sufficient reason for every event; the overthrowing of which principle would overthrow the best part of all philosophy. So it's strange that Clarke should say that in 'accepting' this principle I am guilty of helping myself to a principle without showing that I am entitled to it. His refusal to allow me one of the most essential principles of reason is a mark of how determined he is to stick by his untenable opinions. [Leibniz names his supposed fault *petitio principii*, though Clarke hasn't used that phrase. It is usually translated as 'begging the question', which standardly meant 'arguing for a conclusion from premises that have that very conclusion lurking among them'. (In recent years the ignorance and pretentiousness of journalists has led to its meaning 'raising the question'.) But it's clear that Leibniz, both here and more especially in his **125** on page 48, uses it to mean 'helping oneself to a principle without showing an entitlement to it'. Clarke's reply in the last sentence of this text uses both *petitio principii* and 'begging the question' in pretty much their usual sense.]

To Clarke's 3 and 4 <22>

21 I have to admit that though this great principle has been acknowledged, it hasn't been sufficiently made use of. This is much of the reason why 'first philosophy' [= 'metaphysics'] has so far been much less fruitful and rigorously argued than it should have been. One of the things that I infer from the principle is this:

Nature does not contain any pair of real things that are indiscernible from one other; because if it did, God and nature would be acting without reason in treating one differently from the other; so God doesn't ever produce two pieces of matter that are perfectly equal and alike.

Clarke responds to this conclusion without refuting the reason for it, and his response is a very weak objection. 'If this argument were right,' he says, 'it would prove that God

could not possibly create any matter at all! For the perfectly solid parts of all matter, if you take them to have the same shapes and sizes (which is always possible in supposition), are exactly alike.' But he is plainly begging the question in 'supposing' that perfect likeness, which according to me can't be accepted. This supposition of two indiscernibles—e.g. two pieces of matter that are perfectly alike—does indeed seem to be abstractly possible, but it isn't consistent with the order of things, or with God's wisdom, which doesn't allow *anything* without reason. Ordinary lay-people fancy such things because they rest content with incomplete notions, 'thus regarding something as outright possible on the grounds that it is abstractly possible'. This is one of the atomists' faults too.

22 Besides, I don't accept that matter has perfectly solid parts, ones that are the same throughout with no variety or motion among their parts, which is what so-called 'atoms' are thought to be. The supposition of such bodies is another poorly grounded popular opinion [i.e. opinion that is widely accepted by relatively uneducated people]. My demonstrations show that every part of matter is actually subdivided into parts that move differently, with no one of them being perfectly like any other.

23 I had said that no two sensorily detectable things that are exactly alike can ever be found—e.g. that two perfectly alike leaves in a garden or drops of water are not to be found. Clarke accepts this as regards leaves and 'perhaps' as regards drops of water. But he could also have admitted it without hesitation, without a 'perhaps', as regards drops of water.

24 I believe that these general facts about sensible things are also facts—on a different scale—regarding insensible things And it counts greatly against indiscernibles 'large

or small· that we don't find any examples of them ·among things that are large enough to be seen·. But Clarke opposes inference because (he says) sensible bodies are •composite, whereas he maintains there are insensible bodies that are •simple. I answer again that I don't admit simple bodies. In my view there is nothing simple except genuine monads, which don't have parts and aren't extended. Simple bodies, and perfectly alike bodies (whether simple or not), are a consequence of the false hypothesis of atoms and empty space, or of lazy philosophy that doesn't push the analysis of things down to a deep enough level,

what Leibniz wrote: *et s'imagine de pouvoir parvenir aux premier elements corporels de la nature, parce que cela contenterait notre imagination.*

Clarke's accurate translation: and fancies it can attain to the first material elements of nature, because our imagination would be satisfied with it.

what Leibniz may have meant: and fancies that the level it has reached in the material world is *basic*, because it satisfies the imagination.

25 When I deny that there are any two bodies— drops of water or whatever—that are perfectly alike, i.e. indiscernible from each other, I don't say •that it's absolutely impossible to suppose them, but •that such a thing is contrary to God's wisdom, and consequently doesn't exist.

To Clarke's 5 and 6 <22>

26 I agree that if two things perfectly indiscernible from each other did exist they would be two; but that supposition—the 'if' clause— is false and contrary to the great principle of reason, ·I mean the principle of sufficient reason·. Run-of-the-mill philosophers have gone wrong in thinking that there are two things that differ •in number alone, i.e. differ •only

because they are *two*; and that's the source of their puzzles about the so-called 'principle of individuation'. Metaphysics has generally been handled like a mere study of •words, like a philosophical dictionary, without getting to the analysis of •things. Superficial philosophy like that of the people who believe in atoms and vacuum dreams up things that higher reasoning condemns. I hope my demonstrations will change the face of philosophy, despite feeble objections like the ones Clarke raises against me here.

27 The parts of time and place, considered in themselves, are ideal things; so they do perfectly resemble one another like two •abstract ones—as in the statement that *one plus one makes two*·. But this doesn't hold for any two •concrete ones—such as two real times or two spaces full of stuff and thus truly actual.

28 Clarke seems to accuse me of saying that two points of space are one and the same point, and that two instants of time are one and the same instant; but I don't say either of those things. But someone might mistakenly *think* that there are two different instants where really there's only one, ·and in such a case I might say to him: 'Regarding those two instants x and y that you *think* you have: here's the evidence that all and only the features of x are also features of y, which shows that x and y are not two instants but one·.' As I remarked in **17** on pages 16–17, in geometry we often suppose •two somethings, so as to represent the error of an opponent, and then find only one; as when someone thinks that a straight line cuts another at two points, and we show that these two supposed 'two points' must coincide, so that 'they' are really just one point. . . .

29 I have demonstrated that space is nothing but an order of the existence of things considered as existing together, so that the fiction of a finite material universe moving forward

as a whole, in an infinite empty space, can't be admitted. This fiction is altogether unreasonable—it couldn't happen. For one thing, there *isn't* any real space outside the material universe; and anyway there would be no *point* in moving the universe in that way—such an action would be working without doing anything. No change would be brought about that *anybody* could observe. These are the imaginings of incomplete-notions-philosophers who make space an absolute reality. Such notions are apt to be fudged up by devotees of pure mathematics, whose whole subject-matter is the playthings of imagination, but they are destroyed by higher reasoning.

30 It seems not to be absolutely impossible for God to make the material universe finite in extension, but his not doing so appears to be more in line with his wisdom.

31 I don't agree that everything finite is movable. According to the hypothesis of my adversaries ·Clarke and Newton·, a part of space is something finite yet not movable. Anything movable must be capable of •changing its place in relation to something else, and of •coming to be in a new state [here meaning 'a new over-all situation'; the reference isn't to its *intrinsic* state] that is discernible from the one it began in; otherwise the 'change of place' is merely a fiction. For the moving of a finite thing to make any change that can be observed, the thing must be a part of some other finite thing.

32 Descartes maintains that matter is unlimited, and I don't think this has been properly refuted. And even if he were right about that, it still wouldn't follow that •matter is necessary, or that it •existed from eternity; because if matter were spread without limit through the universe, that would only be because God chose to do this, judging it to be the better ·than any alternative·.

To Clarke's 7 <22>

33 Since space in itself is an ideal thing, like time, space •outside the world must be imaginary, as the scholastics [roughly = 'academic Roman Catholic Aristotelians'] themselves recognized. The case is the same with empty space •in the world, which I take also to be imaginary, for the reasons I have given.

34 Clarke brings against me the vacuum that Guericke discovered, which is made by pumping the air out of a jar; and he claims that there truly is a perfect vacuum, a space without matter, in at least a part of the jar. The Aristotelians and Cartesians, who don't accept that there is any true vacuum, have said in answer to Guericke's experimentthat there is no vacuum at all in the jar, because glass has small pores through which very thin fluids may get into the jar—fluids such as the beams of light, the emanations of a magnet, and so on. I agree with them. I think the jar can be compared to a box with many holes in, containing fish or other gross bodies, and placed in water; when the gross bodies were removed, water would flow in through the holes and take their place. The only difference is that

•though water is fluid and easier to push around than the fish etc., it is at least as heavy and massive as they are,

whereas

•the matter that gets into Guericke's jar in place of the air is much more subtle than air.

Here's how the new friends of vacuum handle this experiment. According to them,

what makes some matter resistant ·to being pushed around· is not its *grossness* but its sheer *quantity*; so that wherever there is less resistance there is ·less

matter and therefore more vacuum.

They add that the subtleness of matter has nothing to do with it, and that the particles of liquid mercury are as subtle and fine as those of water and yet liquid mercury is more than ten times as resistant. To this I reply that what makes resistance is not so much the •quantity of matter as the •difficulty of getting the matter to move. Floating timber contains a smaller amount of heavy matter than does an equal volume of water, yet it gives more resistance to a boat than the water does.

35 As for liquid mercury: it's true that it contains about fourteen times as much *heavy matter* as does an equal volume of water, but that doesn't imply that it contains fourteen times as much *matter*. On the contrary, water contains as much matter as an equal volume of liquid mercury, if we count not only its own matter, which is heavy, but also the extraneous *unheavy* matter that runs through its pores. You see, liquid mercury and water are masses of heavy matter that is full of pores through which there runs a lot of matter that is not heavy and creates no sensible resistance. Light-rays seem to be matter of that kind, and other insensible fluids are examples of it, especially the matter that •causes the *gravity* [here = 'weight'] of gross bodies by •moving *away* from the centre and thus driving the bodies *towards* the centre. Newton has a rival account of weight, a strange fiction according to which all matter gravitates towards all other matter, implying that each body equally attracts every other body according to their masses and distances. This involves attraction strictly so-called, a real *pulling* of bodies towards one another, not the upshot of some hidden *pushing* of bodies. The right explanation for the weight of sensible bodies—their gravitating toward the centre of the earth—is in terms of the motion of some fluid and in terms of pushing, not pulling. The same must be

true for other 'gravities', e.g. the movements of the planets toward the sun and toward each other. The only way a body is ever moved naturally is by being in contact with another body which *pushes* it, after which it keeps moving until it is blocked by another body that comes in contact with it. Any other kind of operation on bodies is either miraculous or imaginary.

To Clarke's 8 and 9 <23>

36 I had objected that space, taken to be something real and absolute without bodies, would be a thing eternal, incapable of being acted on, and not dependent on God. Clarke tries to dodge this difficulty by saying that space is a property of God. In answer to that I said, in my fourth 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 also objected that if •space is a property, and •infinite space is God's immensity, then •finite space will have to be the extension... of something finite. From this it will follow that •the space occupied by a body will be •the extension of that body. This is an absurdity, since a body can change space [meaning 'change its location'] but can't leave its extension!

38 I also asked: If space is a property, what *thing* will an empty, limited space be a property of? (I mean an empty limited space such as Clarke imagines in Guericke's jar.) It doesn't appear reasonable to say that this empty space—perhaps spherical or cubic—is a property of God! Will it then be a property of the immaterial, extended, imaginary substances that Clarke seems to fancy in the imaginary spaces?

39 If space is a property or state [Leibniz's word is *affection*] of the substance that is in space, the same space will sometimes be a state of one body, sometimes of another

body, sometimes of an immaterial substance—and perhaps sometimes, when it doesn't contain *any* other substances, material or immaterial, a state of God. This is a strange property or state, which goes from being *had* by one thing to being *had* by another! The things in question will take off their qualities [Leibniz's word is *accidents*] like clothes, so that other subjects can dress in them. At this rate, how are we to distinguish qualities from substances?

40 All finite spaces taken together make up infinite space; so if finite spaces are states of finite substances that are in them, and infinite space is a property of God, it follows that a property of God is made up out of states of created things—a strange result!

41 If Clarke denies that finite space is a state of finite things, that will undercut his thesis that infinite space is a state or property of an infinite thing. I pointed to all these difficulties in my fourth paper, but apparently Clarke hasn't *even* *tried* to answer them.

42 I have still other reasons against this strange fancy that space is a property of God. If it is so, then space enters into the *essence* of God. But space has parts; so *on this theory* there would be parts in the essence of God. *Spectatum admissi!* [That phrase comes from a line by the Latin poet Horace, meaning roughly 'Look at what a fool he's making of himself!']

43 And again: spaces are sometimes empty, sometimes full. So God's essence will have parts that are sometimes empty and sometimes full, meaning that God's essence will be perpetually changing. . . . Such a *God with parts* will be very like 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. So we'll have to say that whatever is in space is in God's immensity and consequently in his essence, and

that whatever is in time is also in God's essence. Strange expressions, which show that Clarke is misusing language.

45 Here is another sample of the trouble Clarke is in. God's immensity makes him present in all spaces. But given that God is in space, how could it be that space is in God, or that space is a property of God? We've heard of a property being in the thing that has it, but not of a thing being in the property that it has! Similarly, God exists in each time—so how can time be in God, and how can time be a property of God? The barbarisms keep coming!

46 Clarke seems to have confused the immensity or the size of things with the space by which that size is measured. Infinite space isn't God's immensity; finite space isn't the size of bodies, any more than time is their duration [= 'how long they last', 'their temporal size']. Things keep their size, but they don't always keep their space. Each thing has its own size, its own duration, but it doesn't have its own time and doesn't keep its own space. [The five occurrences of 'size' in this section translate *etendue*, which is more usually translated as 'extension'.]

47 This is how men come to form for themselves the notion of space: They consider a number of things existing at once, and find in them a certain *order* of coexistence, according to which things relate to one another more or less simply. This *order* is their situation or distance—i.e. when you know how things are inter-related in terms of this 'order', you know where each thing is, i.e. how far it is from each other thing. When *one* of those coexisting things *x* changes its relation to a number of others that don't change their relations among themselves, and *another* thing *y* comes to have the same relation to the others that *x* previously had, then we say that *y* has 'come into the place of *x*, and we call this change a 'motion' of the body containing the immediate cause of the change. And when many (or even *all*) of the

coexistent things change at once, if this happens according to certain known rules of direction and speed, we can always work out the spatial relation of each of the things to each of the others; and can also work out how this or that one *would have* spatially related to this or that other one if the former hadn't changed at all or hadn't changed in the way it did. And supposing (or taking as an invented case) that a large enough number of those coexisting things underwent no change in their relations to one another, we can count these as *fixed*, and can say that anything y that comes to relate to those fixed things in the way that x used to is now in 'the same place' that x used to occupy. And the totality of all those 'places' is called 'space'. This shows that all we need in order to have an idea of place (and consequently of space) is to consider these relations amongst things and the rules of their changes; we do *not* need to imagine any absolute reality beyond the things whose location we are considering. Here is a kind of definition:

place is what we say is first A's and then B's if: •how B relates to the coexisting things C, E, F, G etc. is exactly the same as •how A previously related to C, E, F, G, etc.—supposing there has been no cause of change in C, E, F, G, etc.

It could also be said. . . that

place is that which is had first by x and then by y when •x relates in a certain way to various existing things and then, while those things remain fixed, •y comes to relate to them in exactly the same way;

fixed existents are those in which there has been •no cause of any change in how they relate to other things, or (the same thing:) in which there has been •no motion.

space is what results from ·all the· places taken together.

It might be as well here to mention the difference between •the place that is had first by x and then by y and •the relation to other things that is had first by x and then by y. The difference is this:

It is strictly, literally, exactly the **same individual place** that is occupied first by x and then by y; but y doesn't come to have the **same individual relation** to things that x had previously. There are two relations here: they *agree* with one another, but they are two, not one.

It is impossible for one individual quality (*accident*) to be in two subjects or to pass from one subject to another. [Some philosophers had thought that in various causal transactions what happens is that some property of one thing goes across to another: e.g. that when a red hot poker is plunged in cold water, it's not just that the water gains *as much* heat ('agreement') as the poker loses, but it gains *the very heat* ('identity') that the poker loses; this is treating that heat as an 'individual accident', or an 'abstract individual'. The thought was that as well as •the poker (concrete individual) and •heat (abstract universal) there is •the heat of that poker at that time (abstract individual).] But the mind, not contented with an •agreement, looks for an •identity, i.e. for something that is truly the same, and it conceives this as outside these subjects; and that's what we here call 'place' and 'space'. But this can only be an ideal thing, ·a conceptual construct·, containing a certain order that the mind conceives in terms of relations ·between things·. Here's an another example of the same general kind of thing:

The mind can give itself a picture of genealogical 'lines', whose 'size' would consist purely in the number of generations, with each person having his place on one of the lines. Add to this (·for purposes of the illustration·) the fiction of soul-migration, so that

a single human soul could turn up a second time further down the line; if that were to happen, someone who was a father or a grandfather might become a son or a grandson, and so on.

Yet those genealogical places, lines, and spaces, though they would *express* real truths, would only *be* ideal things. And here's another example to show how the mind is prompted by accidents that are *in* subjects to invent for itself something that •corresponds to those accidents but •is *outside* the subjects. The ratio or proportion between two lines L and M may be conceived three ways:

- (1) as a ratio of the longer line L to the shorter M,
- (2) as a ratio of the shorter M to the longer L, or
- (3) as something abstracted from both, i.e. the ratio between L and M without considering which is the subject and which the object.

.... In (1) we have 'L is longer-than-M', which means that the longer line L is the subject. In (2) we have 'M is shorter-than-L', which means that the shorter line M is the subject. But which of the two lines will be the subject in (3)? It can't be said that both of them, L and M together, are the subject of such an accident; because that would yield an accident in two subjects, with one leg in each, and that's contrary to the notion of accidents. So we have to say that in (3) this relation is indeed out of the subjects; but because it is neither a substance nor an accident it must be a purely ideal thing, a conceptual construct—though a useful one. A final couple of remarks: What I have done here is quite like a procedure that Euclid adopted. He couldn't give his readers a firm grasp of the geometers' concept of a *ratio* taken on its own, offered instead a definition of *same ratio*. Similarly, in order to explain what *place* is, I have settled for defining *same place*. [Then a final few sentences about *traces* considered as ideal things.]

48 If Clarke's supposed *space with no bodies in it* is not altogether empty, then what is it full of? Is it full of extended spirits, perhaps? They would presumably be immaterial substances that can expand and contract, move around, and easily penetrate each other in the way the shadows of two bodies can penetrate one another on the surface of a wall. I think I see the revival of the funny ideas of Henry More (otherwise a learned and well-meaning man) and of some others who fancied that these spirits can make themselves impenetrable whenever they please. Some have even fancied that man in his state of innocence *also* had the gift of penetration, and that his fall—the sin of Adam in the garden of Eden—made him become solid, opaque, and impenetrable. Isn't it overthrowing our notions of things to give parts to God and extension to spirits? All we need to drive away all these spectres of imagination is the principle of the need for a sufficient reason. Men easily blunder into fictions through not properly using that great principle.

To Clarke's 10 <23>

49 It's wrong to say that a certain duration is eternal; it is all right to say that things that always stay in existence are eternal, always gaining new duration. Anything temporal or durational that exists keeps going out of existence. How can a thing exist eternally if strictly speaking it doesn't exist at all? How can a thing exist when no part of it ever exists? The only temporal items that ever exist are *instants*, and an instant is not a part of time. Anyone who thinks about these remarks will easily grasp that time can only be an ideal thing. And the analogy between time and space helps one to see that the one is as *ideal* as the other. (I have no objection to the statement that a thing's duration is eternal if it means only that the thing stays in existence eternally.)

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, then God must be in some way dependent on time and space—he must stand in need of them. As for the escape-hatch which says that space and time are in God, and are like properties of God, I have already slammed that shut. Could one maintain the opinion that bodies move about in the parts of the divine essence?

To Clarke's 11 and 12 <23>

51 I had objected that space can't be in God because it has parts. This leads Clarke to look for another escape-hatch, by using 'parts' in something other than its ordinary sense, maintaining that because space's part can't be pulled apart from one another they aren't really *parts*. But •for my point to hold good• it is sufficient that space has parts •in the ordinary sense of that word•, whether or not they can be separated from one another. We can specify those parts of space in terms either of the bodies it contains or of the lines and surfaces we can trace on it.

To Clarke's 13 <24>

52 In order to prove that space without bodies is an absolute reality, Clarke objected against me that a finite material universe might move around in space. I answered •that it doesn't seem reasonable that the material universe should be finite, and •that even if it were finite it's unreasonable that it should have any motion except what has its parts changing their locations relative to one another, because such a motion would produce no change that could be observed, and would be done without any purpose. As for parts changing their locations among themselves—that's a quite different thing, for in that case we would recognize a motion in space, but what would be changed is just the order of relations. Clarke now replies that the reality of motion doesn't depend upon

its being observed, and that a ship can go forward while a man inside it isn't aware of its motion. I answer that indeed motion doesn't depend on being •observed, but it does depend on being •observable. When there is no *observable* change there is no motion—indeed there is no change of any kind. The contrary opinion is based on the assumption of *real absolute space*, and I have conclusively refuted that through the principle of the need for a sufficient reason.

53 I don't find in the eighth definition of Newton's *Mathematical Principles of Nature*, or in the note attached to it, anything that proves or *could* prove the reality of space in itself. I do agree that •an absolute genuine motion of a body is different from •a mere change of its location in relation to another body. When the immediate cause of the change •is in body x, that body is truly in motion, and in that case the locations of other bodies in relation to x will be changed as a result, though the cause of that change •is not in them. Strictly speaking, no one body is ever perfectly and entirely still, but we form an abstract notion of *stillness* by considering the thing mathematically. Thus, I have answered *everything* that Clarke has offered in defence of the absolute reality of space. And I have given a knock-down proof that space is not an absolute reality, using a fundamental principle, one of the most reasonable and well-supported, against which no exception or counter-example can be produced. So one may judge from what I have said that I ought not to admit a movable universe, or any *place* outside the material universe.

To Clarke's 14 <24>

54 I'm not aware of any objection that I haven't sufficiently answered. As for the objection that space and time are quantities (it ought to be: 'are things that have quantity'), and that situation and order are not, I answer that *order also has its quantity*; there's what goes first and what follows; there's

distance or interval. Relative things have their quantity as well as absolute ones. For example, ratios or proportions in mathematics have their quantity, and are measured by logarithms; yet they are relations. Thus, although time and space consist in relations, they still have their quantity.

To Clarke's 15 <24>

55 Could God have created the world sooner? In tackling this, we need to understand each other rightly. I have demonstrated that time without things is merely an ideal possibility; so it obviously follows that the statement 'This world that has been actually created could have been created sooner while being otherwise exactly the same' is just unintelligible. That's because there is no differentiating mark by which one could know that this world was created sooner—or, more accurately, by which one could know that this world was created at one time rather than another. And therefore (I repeat) the idea of God's having created the same world sooner than he actually did is a chimerical one; it involves making time an absolute thing that is independent of God, whereas time must coexist with created things and is conceived only in terms of the order and quantity of their changes.

56 But yet, absolutely speaking, we *can* make sense of the idea that a universe might have begun sooner than it actually did. [Leibniz here provides a diagram, but we don't need it. The possibility he is talking about is that our actual universe might have had an earlier stage—a sequence of events that haven't actually occurred, running on into the events that were actually the first in the actual world. He continues:] In this way, things [here = 'events'] being increased, time will also be increased. But whether such an enlargement of our world is reasonable and fitting to God's wisdom is another question, to which I answer No; otherwise the enlargement

would have been actual—God would have done it. . . . The case is the same with respect to the duration of the universe. Just as we can conceive of something added to the beginning, so we can conceive of something taken off toward the end. But such a retrenchment would also be unreasonable.

57 This shows us how we should understand the statement 'God created things at what time he pleased', for it's just a matter of what things he chose to create. Once he had decided on the things, and on how they were to relate to one another, there was no further choice to make concerning the time and the place, which have no intrinsic reality, nothing that can distinguish them, nothing discernible.

58 So one can't say, as Clarke does here, that the wisdom of God may have 'good reasons' to create this world [Leibniz then repeats it in English: *this world*] at such and such a particular time; because that particular time, considered without the things, is an impossible fiction, and there can't be 'good reasons' for a choice where everything is indiscernible.

59 When I speak of 'this world', I mean the whole universe of material and immaterial created things, taken together, from the beginning of things. But if Clarke meant to be speaking only of the beginning of the *material* world, and was supposing that immaterial created things existed before that, he would be in better shape. For in that case the time when the material world began would be marked by things that existed already, so the choice between one starting-time and another would no longer be indifferent, and there might be a choice to be made. But this merely pushes the difficulty back; for we still have the point that there is, again, no choice about the time at which God would place the beginning of the *whole* universe of immaterial and material created things.

60 So one shouldn't say as Clarke does here that God created things in what particular space and at what particular time 'he pleased'. Given that all times and all spaces are in themselves perfectly uniform and indiscernible from each other, no one of them can 'please' more than any other.

61 I don't want to spend time here presenting my opinion, which I have explained elsewhere, that there are no created substances that are wholly destitute of matter. I hold—in agreement with the ancients, and in accordance with reason—that angels or intelligences, and souls separated from any large lumpy body, always have finely divided fluid bodies, though they themselves aren't bodies. The vulgar philosophy easily admits all sorts of fictions; mine is more strict.

62 I don't say that matter and space is the same thing. I say only there is no space where there is no matter, and that space in itself is not an absolute reality. Space differs from matter in the way that time differs from motion. But although these things—space and matter, time and movement—are different, they are inseparable.

63 But it doesn't *at all* follow that matter is eternal and necessary, unless we suppose space to be eternal and necessary—a supposition that is ill-grounded in every way.

To Clarke's 16 and 17 <24>

64 I have answered all of this, I think, and especially the objection that space and time have quantity while order has none. See my **54** two pages back.

65 I showed clearly that the contradiction lies in the hypothesis that I was opposing—the one that looks for a difference where there isn't one. And it would be plain *bad behaviour* to infer from this that I have acknowledged a contradiction in my own opinion.

To Clarke's 18 <24>

66 Here we find an argument that I have overthrown—see my **17** on page 30. According to Clarke, God may have good reasons to make two cubes that are perfectly equal and alike, and then (he says) God must have to assign them their places, even though there is nothing to choose between any two places. But things shouldn't be separated from their circumstances. This argument of Clarke's is built out of incomplete notions. God's resolutions are never abstract and incomplete, as they would be if God decreed *first* to create the two cubes, and *then* made another decree about where to place them. Men can proceed in that way; indeed they *have to*, given what limited creatures they are. They may decide on something and then find themselves perplexed about means, ways, places, and circumstances for the thing they have abstractly decided on. But God never makes a decision about the ends without at the same time deciding on the means and all the circumstances. Indeed, I have shown in my *Theodicy* that strictly speaking there is only one divine decree for the whole universe—the decree in which God resolved to bring this universe out of possibility into existence. So God won't choose a cube without at the same time choosing where to put it; and he will never choose among indiscernibles.

67 The parts of space are fixed and differentiated only by the things that are in it; and the variety of things in space leads God to act differently on different parts of space. But space considered without things has nothing by which it can be fixed; indeed it isn't anything actual.

68 If God has resolved to place a certain cube of matter somewhere, he has also resolved where to put it. But that 'where' is a set of relations to other parts of matter, and not a relation to bare space itself. . .

69 But God's wisdom doesn't allow him to place at the same time two cubes that are perfectly equal and alike, because there is no way to find any •reason for assigning them different places. If he did do this, it would be an act of will without a •motive.

70 I had compared •this act of will without motive that superficial reasoners think God performs with •Epicurus's *chance*. Clarke answers that 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 introduced it precisely so as to *avoid* necessity. It's true that his chance is blind; but an act of will without motive would be just as blind and just as much a product of mere chance.

To Clarke's 19 <25>

71 Clarke repeats here something that I refuted in my **21** on page 31, namely that God can't create matter without choosing among indiscernibles. He would be right about this if matter consisted of atoms, particles that are exactly alike, or other such fictions of superficial philosophy. But the great principle that rejects choice among indiscernibles also destroys these ill-contrived fictions. ·I'm referring, of course, to the principle of the need for a sufficient reason·.

To Clarke's 20 <25>

72 Clarke had objected against me in his **7, 8** on page 14 that if God were determined by external things, he wouldn't have a source of action in himself. I replied that the ideas of external things are in him, and that therefore he is determined by internal reasons, i.e. by his wisdom. But Clarke refuses to understand what my point was.

To Clarke's 21 <25>

73 In his objections against me, Clarke frequently mixes up what God •won't do with what he •can't do. See my **9** on page 29 and **76** just below. For example, God •can do

everything that is possible, but he •will do only what is best. So I don't say, as Clarke here alleges, that God can't limit the extension of matter; I say only that he seems not to want to do that, having found it better to set no bounds to matter.

74 From extension to duration—invalid inference! Even if the extension of matter were unlimited, it wouldn't follow that its duration was also unlimited; it wouldn't even follow that it had no beginning. If it is the nature of things, taken as a whole, to grow uniformly in perfection, the universe of created things must have had a beginning; so we have there a reason to limit the •duration of things, a reason that would hold even if there were no reasons to limit their •extension. Furthermore, the world's having a beginning still leaves it possible that it has no ending, and therefore has an infinite duration; whereas ·spatial· bounds of the universe would undercut the infinity of its extension. So it is more reasonable (and more in tune with God's character) to admit a •beginning of the world than to admit •any ·spatial· bounds of it.

75 But those who have admitted the eternity of the world, or at least (as some famous theologians have done) the *possibility* of the world's being eternal, haven't been denying that it depends on God, as Clarke here groundlessly implies that they have.

To Clarke's 22, 23 <25>

76 He here further objects, without any reason, that according to me God *must* have done everything he was *capable* of doing. It's as if he didn't know that •I have solidly refuted this view in my *Theodicy*, and that •I have overthrown the opinion of those who maintain that the only things that are possible are the ones that really happen. . . Clarke muddles •moral necessity, which comes from the choice of what is best, with •absolute necessity; he muddles God's •will with his •power.

God *can* produce everything that is possible, everything that doesn't imply a contradiction; but he *wills* only to produce what is the best among things that are possible. See my **9** on page 29 and **74** just above.

77 So God is not a necessary agent in his production of created things, because ·in doing this· he is acting with choice. Not that there's any basis for Clarke's assertion that a *necessary* agent wouldn't be an *agent* at all. He frequently comes out with confident pronouncements that he has no grounds for, advancing against me theses that couldn't be proved.

To Clarke's 24-28 <25>

78 Clarke says that what Newton said was not that space is God's sensorium, but only that space is 'as it were' God's sensorium. That seems to me to be as improper and as unintelligible as the other.

To Clarke's 29 <25>

79 Space is not 'the place of all things', because it is not the place of God. If it were, it would be a thing co-eternal with God, and independent of him; indeed, if he needs to have a place, *he* would be dependent on *it*.

80 And I don't see how it can be said that space is the place of ideas; for ideas are in the understanding.

81 Also, it's very strange to say that the soul of man is the soul of images. The images that are in the understanding are •in the mind; but if the mind was the soul of the images, they would then be •outside the mind. And if Clarke is talking only about corporeal images ·i.e. the brain states corresponding to mental images—how can he think that our mind is the soul of *those*, when they are only transient impressions in a body belonging to that soul?

82 If it's by means of a sensorium that God senses what happens in the world, it seems that things act on him,

making him what we call 'a soul of the world'. Clarke charges *me* with repeating objections and ignoring his answers; but I can't see that he has answered this difficulty. He would do better if he completely dropped this supposed sensorium.

To Clarke's 30 <25>

83 Clarke speaks as if he didn't understand how it is that on my view the soul is a representative principle [= 'source of representations']. It's as though he had never heard of my 'pre-established harmony'.

84 I don't accept the vulgar notions according to which the images of things are 'conveyed' [Leibniz uses the English word] by the organs ·of sense· to the soul. There's no conceivable •vehicle in which, and no conceivable •gate through which, these images can be carried from the organ to the soul. The new Cartesians have shown well enough that this notion in the vulgar philosophy is not intelligible. It can't be explained how •immaterial substance is affected by •matter; and basing an unintelligible notion on *that* is having recourse to the chimerical scholastic notion of I know not what inexplicable 'intentional species' passing from the organs to the soul. [Intentional species' were supposed items broadly like the 'individual accidents' sketched in the note on page 36.] Those Cartesians saw the problem, but they didn't solve it: they dealt with it by a special concourse on God's part, which *would* be miraculous. I think I have given the true solution of that enigma.

85 To say that God discerns what happens in the world because •he is present to the things, and not because •their continued existence involves a dependence on him (a dependence that could be said to involve a continual production of them), is to say something unintelligible. A mere •presence, or •existence-alongside, isn't enough to make us understand how what happens in one being could correspond to what happens in another.

86 Besides, this is exactly falling into the view that God is the soul of the world. It says that God senses things not through •their dependence upon him (i.e. his continual production of what is good and perfect in them), but through a kind of feeling like the one through which some people think that our soul senses what happens in the body, This is a tremendous downgrading of God's knowledge. [Here 'feeling' translates *sentiment*. The word can also mean 'opinion' and other things, but 'feeling' goes best with the repeated verb 'senses'— regarding which, see the long note on page 1.]

87 The fact of the matter is that this sort of 'sensing' is wholly chimerical; it doesn't even occur in ·human· souls. *They* sense what goes on outside them through what happens in them, corresponding to what happens outside. They do this by virtue of the harmony that God has pre-established, in the most beautiful and most admirable of all his productions, through which every simple substance is by its nature a concentration [here roughly = 'perfect small-scale model'] and a living mirror (so to speak) of the whole universe, according to its point of view. This is also one of the most beautiful and undeniable proofs of the existence of God, because such a harmony of things couldn't be produced by anything except God, the universal cause. But God himself can't sense things by the same •means by which he makes other beings sense them. He does sense them; ·he must do so· because he is able to produce that •means. He couldn't make •things so that they could be sensed by other beings if he didn't have a representation of them in himself, this being needed for his work of creating them so that they harmonize ·with one another·. It's not a representation coming *from* the things ·that are represented·; he represents them because *they* come from *him*, and because he is their efficient. . . cause. *He senses them because they come from him*—if it's all right to say that he 'senses' them; and it *isn't* all right unless we

divest that word of its implication that things act on him. They exist and are known to him because he understands and wills them, and being willed by him is tantamount to existing. This appears even more strongly in his making them sense one another. And in *how* he does this: he makes them sense one another as a consequence of the ·intrinsic· nature •that he has given each of them, once for all, and •that he merely *maintains* according to the laws ·governing the histories· of the individual things—with a different law for each thing, but with each law resulting in a series of states that exactly correspond to the states of everything else. This surpasses all the ideas that men have generally formed regarding God's perfections and his works. It raises ·our notion of· them to the highest degree. . . .

88 It's a serious misuse of the biblical passage in which God is said to have 'rested' from his works to infer from it that there is no longer a continual production of them. It's true that there is no production of new simple substances; but it would be wrong to infer from this that God is now in the world only in the way Clarke thinks the soul is in the body, governing it merely by his presence, without his help being needed for its continued existence.

To Clarke's 31 <25>

89 The harmony or correspondence between the soul and the body is not a •perpetual miracle; it's the effect of the start-up miracle that God performed in the creation of things. All natural things are effects of that! The soul-body harmony is indeed a •perpetual marvel, and so are many natural things.

90 The phrase 'pre-established harmony' is indeed an invented technical term; but it isn't one that explains nothing, since I have presented it very intelligibly, and Clarke hasn't said anything pointing to any difficulty in it.

91 The nature of every simple substance (or soul or true monad) is such that its state at any time is a consequence of its preceding state—*voilà!* the cause of the harmony completely revealed! All God needs to do is to make each simple substance, right from the outset, a representation of the universe according to its point of view. This—*just this*—guarantees •that the substance will be such a representation perpetually, and •that all simple substances will always have a harmony among themselves because they always represent the same universe.

To Clarke's 32 <25>

92 It is true that on my view the soul doesn't interfere with the laws of the body, or the body with the laws of the soul. Soul and body only *agree* together;

the •soul acting •freely, according to the rules of •final causes [= 'purposes and intentions'], the •body acting •mechanically, according to the laws of •efficient causes [i.e. what you and I would simply call 'causes'.]

But this doesn't take anything away from the liberty of our souls, as Clarke says it does. Every agent that acts according to final causes is free, even though it happens to agree with something that acts only by efficient causes (acts without knowledge, acts mechanically). That is because God foresaw what the free cause would do, and set up the machine, from the outset, in such a way that it couldn't fail to agree with that free cause. . . . I'll return to this topic in **124** on page 48.

To Clarke's 33 <26>

93 I don't accept that every action gives a new force to the thing that is acted on. It often happens in collisions that each body preserves its force—e.g. when two equal hard bodies collide head-on. In that case, only their directions are changed, without any change of force: each body receives the direction of the other, and bounces the way it came, with

the same swiftness.

94 But I am far from saying that it is supernatural to give a new force to a body, for I realize that it often happens that one body receives a new force from another, which loses that same amount of force. All I say is that it is supernatural for the whole universe of bodies to receive new force so that one body acquires new force without an equal loss of force in other bodies. That's why I say that it is an indefensible opinion to suppose that the soul gives force to the body; for then the whole universe of bodies would receive a new force.

95 Clarke faces me with a dilemma: I must say either that a man acts supernaturally or that he is a mere machine such as a watch. There is no substance to this! A man doesn't act supernaturally; and his body is truly a machine that acts only in a mechanical way, yet his soul is a free cause.

To Clarke's 34, 35 <26>

96 I refer here to my **82** and **86** a couple of pages back, and to my **111** on page 47, concerning the comparison between God and a soul of the world, and how Clarke's position against me brings God *too close* to being the soul of the world.

To Clarke's 36 <26>

97 I refer here to my **89** a page back, etc., concerning the harmony between the soul and the body.

To Clarke's 37 <26>

98 Clarke tells us that the soul is not in the brain but in the sensorium, without saying what this sensorium *is*. But taking it that the sensorium is extended, as I believe Clarke thinks it is, the same difficulty still remains, and the question faces us again: Is the soul diffused all through that extended thing? The sensorium can be big or small; that makes no difference, because *size* is irrelevant to our difficulty here.

To Clarke's 38 <26>

99 I don't undertake to establish here my •dynamics, i.e. my •doctrine of forces; this isn't the right place for that. Still, I can appropriately answer the objection that Clarke brings against me here. I have maintained that active forces are preserved in the world—meaning that the *amount* of them is constant. Clarke objects that when two soft or un-elastic bodies collide they lose some of their force. I say that they don't. It's true that their •wholes lose it with respect to their over-all motion; but their •parts receive it through being shaken internally by the force of the collision. So there only *seems* to be a loss of force. The forces aren't •destroyed, but •scattered among the small parts. That isn't *losing* force; it's more like exchanging a gold coin for its equivalent in small change. I agree, however, that the quantity of *motion* doesn't remain the same, and I approve what Newton says about this in his *Optics*, which Clarke here quotes. But I have shown elsewhere that there is a difference between quantity of •motion and quantity of •force.

To Clarke's 39 <26>

100 Clarke had maintained against me (**13**, **14** on page 11) that the amount of force in the material universe does naturally decrease, and that this arises from the dependence of things. In my **39** on page 19 I challenged him to prove that this flaw is a consequence of the dependence of things. He avoids answering my challenge, by merely picking on one •supposed• example and denying that *it* is a flaw. But whether or not it's a flaw, he should have proved that it is a consequence of the dependence of things.

101 And anyway, something that would make the machine of the world as imperfect as that of an unskilful watchmaker surely must be a flaw.

102 Clarke says now that it is a consequence of the inertia of matter; but he isn't going to prove that either. This inertia that he talks about—mentioned by Kepler and by Descartes in his letters, and given a certain role in my *Theodicy*. . .—amounts only to this: velocities go down when the quantities of matter go up; it doesn't involve any lessening of the forces.

To Clarke's 40 <26>

103 I had maintained that •the world-machine's dependence on its divine author is what prevents it from having this flaw, that •God's work doesn't need to be corrected, that it •isn't liable to go out of working order, and •can't lessen in perfection. How Clarke can get from this that I am committed to saying that the material world is infinite and eternal, with no beginning, and that God must have created as many men and other kinds of creatures as can possibly be created—that is anybody's guess! [See note after **40** on page 26.]

To Clarke's 41 <26>

104 I don't say that space is an order or situation which makes things able to be situated: this would be nonsense. A reader needs only to consider my own words •in **41** on page 20, and add them to what I said in **47** on pages 35–37, to see how the mind comes to form to itself an idea of space, with no need for any corresponding space that is real and absolute—not owing its existence to anything in the mind or to any relations. So I don't say that space is an order or situation. I say that it is an order of situations, i.e. an order in which situations are laid out; and abstract space is that same order of situations conceived as being *possible*. So space is something ideal; but Clarke seems not to want to understand me. I have already answered the objection that order is not capable of quantity— see my **54** on page 38.

105 Clarke objects here that time can't be an order of successive events, because

what Leibniz wrote: *la quantité du temps peut devenir plus grande ou plus petite, l'ordre des successions demeurant le même.*

what those words mean: the amount of time can become greater or smaller, with order of the successions remaining the same.

what Leibniz seems to have meant by them: the amount of time occupied by a sequence of events may be long or short, independently of how many events the sequence contains and of the order in which they occur.

I reply that that's not so. The •longer the stretch of time is, the •more successive and alike events will occur in it, and the •shorter the •fewer. That is because there is no •vacuum or •condensation or •penetration (so to speak) in times any more than there is in places.

106 I maintain that if there were no created things, God would still have his immensity and eternity, but those attributes would not depend either on times or on places. If there were no created things, there wouldn't *be* either time or place—so there would be no actual space. God's immensity is independent of space, just as his eternity is independent of time. The only spatial and temporal aspects of these two attributes are these: if any other things do exist, God's immensity will make him present to them all, and his eternity will make him co-existent with them all. So I don't agree with Clarke's statement that if God existed alone there would be time and space as there is in actuality. As against that, I maintain that if God existed alone, space and time would be only in his ideas, ideas of mere possibilities. God's •immensity and •eternity are attributes of a higher order than the •extension and •duration of created things—not

only *greater* but also *of a higher nature* than them. Those divine attributes don't need there to be anything other than God—e.g. actual places and times. These truths have been pretty well recognized by theologians and philosophers.

To Clarke's 42 <26>

107 I had maintained that if, as Clarke claimed, the machine of the material world naturally tended to slow down and stop, God's work of keeping it up to speed would be a miracle. He replied that it wouldn't be a miraculous operation because it would be part of the usual course of events. I replied that •what makes something a miracle in the proper sense of 'miracle'—or a miracle of the highest sort [see Leibniz's **44** on page 20]—is not its being unusual but its surpassing the powers of created things, that •this is the opinion of theologians and philosophers; and that •therefore the •divine world-energising operation that Clarke believes in and I don't *is* a miracle of the highest sort, i.e. one that surpasses all created powers, which is the very thing that everyone tries to avoid in science. He now answers that this is appealing from reason to vulgar opinion. But I answer back that this 'vulgar opinion'—that in science we ought to avoid as much as possible anything that surpasses the natures of created things—is a very reasonable one. Otherwise nothing will be easier than to account for anything by bringing God into the story as a *Deus ex machina* [= 'a god trundled onstage by the scenery-shifting machinery'], without paying any attention to the natures of things.

108 Besides, the common opinion of theologians oughtn't to be regarded as merely 'vulgar opinion'. We shouldn't venture to contradict it unless we have weighty reasons for doing so, and I don't see any here.

109 As for Clarke's view that a miracle has to be unusual: he seems to drop that in his **31** on page 25, where he scolds

me (though with no basis for doing so) for accepting a pre-established harmony that would be 'a perpetual miracle'. Or perhaps he isn't deserting his own notion of miracle, but is arguing against me *ad hominem*. [An *ad hominem* argument against x's opinion that P merely argues that x isn't in a position to accept P; the Latin phrase means 'against the man'.]

To Clarke's 43 <26>

110 If a miracle differs from what is natural only in appearance and in relation to us, so that we reserve the term 'miracle' for kinds of events that we seldom see, there won't be any *intrinsic* real difference between the natural and miraculous: fundamentally, either everything will be equally natural or everything will be equally miraculous. Will theologians accept the former, or scientists the latter?

111 Also, won't this doctrine tend to make God the soul of the world, if all his operations are natural like those of our souls on our bodies? And so God will be a *part* of nature.

112 In good science and sound theology we ought to distinguish what can be explained by the natures and powers of created things from what can't be explained without bringing in the powers of God, the infinite substance. We ought to make an infinite difference between operations of God that go beyond the extent of natural powers and operations of things that follow the laws God has given them— laws that he has enabled them to follow by their natural powers, though not without his help.

113 This overthrows 'attractions', properly so-called [i.e. pulls that aren't disguised pushes], and other operations that can't be explained through the natural powers of created things. Those who believe in such operations must either think they are brought about miraculously or else resort to absurdities in their attempts to make them look natural. I'm referring to the absurd 'occult qualities' that the scholastics postulated.

Some people have started to revive those and to palm them off on us under the glittering title of 'forces'; but where they lead is into the kingdom of darkness. Bringing *those* into science *now* is eating acorns when corn has been discovered [Leibniz says this in Latin, probably quoting].

114 [In this paragraph Leibniz deplores the tendency of physics to fall away from the heights to which 'Boyle and other excellent men' brought it, and especially from the thesis that in the province of physics 'everything is done mechanically'. An analogous flight from reason towards romantic glitter, he adds, has also been occurring in literature. Clarke in his fifth and final paper doesn't mention this section.]

115 As for motions of the heavenly bodies, and also as for the formation of plants and animals, there's nothing in any of them that even looks like a miracle except for their beginning. The organism = organisation of animals is a mechanism that had to be shaped up in the first place by God, but with everything after that being purely natural and entirely mechanical.

116 Everything that happens in the body of man or of any animal is just as mechanical as what happens in a watch. The only difference between the two is the difference there *ought to be* between a machine invented by God and one made by such a limited craftsman as man is.

To Clarke's 44 <27>

117 There's no difficulty among theologians about the miracles of angels. The question is only about the use of the word 'miracle'. We can say that angels perform miracles though not in the most proper sense of that word, or that they perform miracles though not ones of the highest order. . . .

To Clarke's 45 <27>

118 I had objected that 'attraction' properly so called, 'attraction' in scholastic-speak, would be an operation at a

distance, without means. [Regarding 'means', see note on Clarke's **45** on page 27.] Clarke accepts that attraction without any means would be a contradiction. Good! But then what is he getting at when he says that the sun 'attracts' the earth through an empty space? Does God serve as the means? That *would* be a miracle; if it ever happened—something far beyond the powers of created things.

119 Or perhaps the means of attraction are •some immaterial substances or •spiritual rays, or some •accidents without a substance [see note on page 36], or some kind of 'intentional species' [see note in **84** on page 42], or some other who-knows-what? Clarke seems to have retained a good stock of such things in his head, without explaining himself adequately.

120 This *means* of interaction, he says, is 'invisible, intangible, not mechanical'. He would have been equally right if he added 'inexplicable, unintelligible, precarious, groundless, and unprecedented'!

121 But it is regular, says Clarke; it is constant and consequently natural. I answer that it can't be regular if it isn't reasonable, and it can't be natural if it can't be explained through the natures of created things.

122 If genuine attraction is brought about by genuine means that are constant and at the same time not explainable through the powers of created things, then that is a perpetual miracle. If it isn't miraculous then it isn't genuine—it's a chimerical thing, a scholastic 'occult quality'.

123 The same thing would hold for a body whirling around in a circle without shooting off along the tangent, although there is nothing intelligible blocking it from doing so. I produced this example before, and Clarke hasn't seen fit to answer it because it shows too clearly how •what is truly natural differs from •a chimerical occult quality such as the scholastics believe in.

To Clarke's 46 <27>

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 •the corresponding body, i.e. •the machine to which they have been adapted in advance by •God•, a free and superior cause. I have already spoken of this in **92** on page 44 [including notes on 'efficient cause' and 'final cause'].

125 An objection that Clarke brought against me at the start of his fourth paper has been answered in **18-20** [page 30]; but I want to say more about it, and have saved that up until now, at the end of my fifth paper. He claimed that I have helped myself to a principle without justifying doing so. Tell me, please, *what* principle? . . . It is the principle of the need for a sufficient reason for

•a thing to exist, •for an event to happen, •for a truth's *being* a truth.

Is this a principle that needs to be proved? Clarke had granted it, or made a show of granting it, in his **2** on page 12, perhaps because it would have seemed too shocking to deny it. But •now he challenges my right to it; so •he is contradicting himself, unless either •he means to retract his earlier acceptance of the principle or •that 'acceptance' was only verbal.

126 I venture to say that without this great principle one can't prove the existence of God, or account for many other important truths.

127 Hasn't *everyone* made use of this principle a thousand times? Admittedly on many other occasions it has been carelessly neglected, but that neglect •isn't evidence that the

principle is unreliable or limited in its scope. Rather, it has been the true cause of such chimeras as

- absolute real time or space,
- vacuum,
- ‘attraction’ in the scholastic sense of the word,
- real influence of the soul over the body,

and a thousand other fictions, either carried over from the ancients or recently invented by modern philosophers.

128 Why did the ancients mock Epicurus’s groundless theory about atoms’ ‘randomly’ ‘swerving’? Wasn’t it because he was violating this great principle of the need for a sufficient reason? And I venture to say that scholastic ‘attraction’, equally mocked about thirty years ago when Newton’s *Principia* was first published and now undergoing a revival, is no more reasonable.

129 I have often challenged people to produce a counter-example to that great principle—i.e. to point to *just one* uncontroversial case where it fails. They’ve never found one, and they never will. The principle succeeds in countless

cases—actually it succeeds in every known case in which it has been applied. This makes it reasonable for us to judge that it will succeed also in unknown cases, and in ones that can’t be known except with its help. So we get support for the principle by following the method of experimental philosophy [here = ‘empirical science’], which proceeds *a posteriori*, even if the principle weren’t otherwise justified by pure reason, or *a priori*.

130 To deny this great principle is to do what Epicurus did; he was reduced to denying that other great principle, namely the principle of contradiction, which says that every intelligible statement must be either true or false. [Leibniz seems to have slipped here. What he has stated is the ‘principle of excluded middle’—nothing in the middle, between true and false. The principle of contradiction—as Leibniz himself says on page 3—says that no statement can be *both* true *and* false.]. . . Anyway, I believe reasonable and impartial people will grant me that having forced my adversary to deny the principle of the need for a sufficient reason I have shown his position to be absurd.

Clarke’s fifth reply (29 October 1716)

[This brought no response from Leibniz, who died two weeks later.]

I’ll try to give a clear response to this fifth paper as briefly as I can. Torrents of words aren’t evidence of clear ideas in the writer, nor are they a proper way of conveying clear notions to the reader.

To Leibniz’s 1–20 <pages 28–31>

There is no **(3)** similarity between a balance’s *being moved*

by weights (moved because pushed) and a mind’s *moving itself* (acting on motives). The difference is that the balance is entirely passive, i.e. is subject to absolute •necessity; whereas the mind, as well as being acted on, also *acts*, which is the essence of •liberty. Leibniz supposes **(14)** that

If the alternative ways of acting appear to be equally good, that deprives the mind of all power of acting

in any of those ways, just as an equality of weights keeps a balance necessarily at motionless.

This denies that the mind has a source of action in itself. It confuses •the mind's power of acting with •its passively receiving an impression from the motive. The motive—i.e. the thing considered as in view [Clarke's phrase]—is external to the mind, and when it makes an impression on the mind, the mind is passively receiving a certain perception; but what happens then, as a result of that perception, involves the power of self-motion or action, which. . . is what we call 'liberty', strictly speaking. The failure to carefully distinguish these things (15) . . . leads men to think that the mind is no more active than a balance would be if the balance had a power of perception—which is wholly taking away the very notion of liberty. . . . A free agent, when confronted by several perfectly alike and reasonable ways of acting, has within itself, by virtue of its source of self-motion, a power of acting; and it may have very strong and good reasons not to *not act at all*. . . To affirm, therefore, (16-19, 69) that

if two different ways of placing certain particles of matter were equally good and reasonable, God *could not wisely*—and therefore *could not*—place them in either of those ways, because there would be no extra weight to settle which way he should choose,

is to make God not an active being but a passive one, and thus not to be a god or a governor at all. And in support of his thesis that there can't be two equal parts of matter that could switch locations without anything's being made better or worse, all Leibniz can offer is the (20) *petitio principii* [see note on page 60] that if that happened Leibniz's notion of *sufficient reason* would not be well-grounded. What other basis could anyone have for saying (16, 17, 69, 66) that it is impossible for God to have wise and good reasons to create many particles of matter exactly alike in different parts of the

universe? Leibniz maintains that if such a thing occurred, God would be acting with (16, 69) *mere will but no reason* in putting the particles in one set of locations rather shuffling them into different locations that would have been just as good. But that is not true. If God had wise reasons to create many particles of matter exactly alike, he would also have a motive—a reason—to do what a balance couldn't do, namely *put them in one of the sets of locations*, although any other would have been as good. In philosophical contexts 'necessity' always refers to *absolute* necessity (4-13) . The phrases 'hypothetical necessity' and 'moral necessity' are mere figures of speech; what they refer to is not, strictly speaking, any kind of necessity. The real question about something's necessity is not about hypothetical necessity:

•Given that x exists, or that it will exist, does it follow that it must exist?

Nor is it about moral necessity:

•Is it true that a good being cannot do evil while continuing to be good? that a wise being cannot act stupidly while continuing to be wise? that a truthful person cannot act tell a lie while continuing to be truthful?

The true and only question in philosophy concerning liberty and necessity is of this type:

•When we regard someone x as an agent, is the immediate physical cause or principle [= 'source'] of action in x himself or is the real cause of the 'action' something external to x that acts on him?

Incidentally, Leibniz contradicts himself when he says (11) that the will doesn't always precisely follow the practical understanding because it may sometimes find reasons to delay making a decision. For aren't those very reasons the last judgment of the practical understanding?

To Leibniz's 21–25 <31–32>

If it is possible for God to make two pieces of matter exactly alike so that there would be nothing to choose between locating them in one way and locating them in the switched way, Leibniz's notion of a sufficient reason collapses. What his position requires him to say in response to this is that it *isn't* possible for God to make two pieces exactly alike; but what he says is just that it wouldn't be *wise* for God to do that. But how does *he* know it wouldn't be wise for God to do so? Can he prove that it isn't possible for God to have wise reasons for creating many parts of matter exactly alike in different parts of the universe? The only argument he gives for this is that then there wouldn't be a sufficient reason to settle God's will on one set of locations rather than some other. . . . I do believe that this is an (20) open begging of the question. As for my similar argument concerning the absolute indifference of the direction of the first shove given to the universe, Leibniz hasn't replied to that.

To Leibniz's 26–32 <32–33>

These seem to contain many contradictions. •Leibniz allows (26) that two things exactly alike would really be *two*; and yet he alleges that there would be no principle of individuation for them, and in his fourth paper (6) <16> he says outright that 'they' would be merely a single thing with two names. •A supposition is allowed to be possible (26) , yet I am not allowed to make that supposition. •The parts of time and space are allowed to be exactly alike in themselves (27) , but not so when bodies exist in them. [After a tremendously point-missing criticism of Leibniz's 28 , Clarke continues:] •Leibniz says that (29) space is nothing but the order of things co-existing; and yet (30) he admits that the material universe may be finite; but in that case there would have to be empty space all around it. [Then a poor objection

to things Leibniz says (30, 8, 73) about the possibility of the material world's being finite. Then:] •He says that that the motion of the material universe would produce (29) no change at all; but he doesn't answer my point that a sudden increase or stopping of the motion of the universe would give a perceptible shock to all the parts, and that a circular motion of the universe would produce a centrifugal force in all its parts. . . . •Leibniz asserts that motion necessarily implies a (31) relative change of situation of one body in relation to other bodies; but he doesn't show any way to avoid the absurd consequence that the mobility of one body would depend on the existence of other bodies, so that a single body existing alone would be unable to move. . . . Lastly, •Leibniz asserts that the (32) infiniteness of matter is an effect of God's will; but he endorses Descartes's notion of matter as infinite as irrefragable [= 'impossible to refute'; actually what Leibniz says is 'I don't think it has been properly refuted'], and everyone knows that Descartes's sole basis for his view was that it would be a contradiction to suppose matter to be finite. If that is so, then it never was in God's power to determine the quantity of matter; and consequently he didn't create it and can't destroy it. . . .

To Leibniz's 33–35 <33>

I had argued against the thesis that all of space is filled with matter on the basis of the lack of resistance in certain regions. Leibniz answers that those regions are filled with a matter that has no (35) gravity [= 'weight']. But my argument had to do not with •gravity but with •resistance; and resistance must be proportional to the amount of matter, whether or not the matter has gravity. . . . To head off this reply, Leibniz claims (34) that resistance arise not so much from the amount of matter as from the difficulty of pushing it aside. But this utterly misses the target, because the question related only

to fluid bodies that have little or no stickiness, such as water and liquid mercury, whose parts have no difficulty of giving place except what arises from the quantity of the matter they contain. Leibniz gives the example (34) of a floating piece of wood that contains less heavy matter than does an equal bulk of water though it makes greater resistance—that is amazingly bad scientific thinking! If a bulk of water equal to the wood were. . . frozen into ice, and floating, it would put up *more* resistance than the floating wood. The point is that the resistance would then arise from the *whole* bulk of the water, whereas when the water is loose and at liberty in its state of fluidity, the resistance is put up by only a part of it, not the whole, and so *of course* it seems to make less resistance than the wood.

To Leibniz's 36-48 <33-37>

These sections don't seem to contain any serious arguments, but only to represent in an unfavourable light the notion of the immensity or omnipresence of God. [Clarke quickly reels off a list of complaints and rejoinders, which are not of much interest until we come to this:] God does not exist (45) in space or in time; but his existence causes space and time. (See my footnote on page 23.) And when in our somewhat metaphorical common speech we say that 'God exists in all space and in all time', all we mean is that he is omnipresent and eternal, i.e. that boundless space and time are necessary consequences of his existence. We do *not* mean that space and time are beings distinct from him, *in* which he exists.

[Clarke goes on to say that he has already said all he needs to regarding Leibniz's 46-8 . He appends a long footnote, which is given here in the main text:]

START OF CLARKE'S LONG FOOTNOTE

The main reason for the confusion and inconsistencies that appear in what most writers have said about the nature

of space seems to be their failure properly to attend to a couple of distinctions—distinctions that are easy to miss, but that have to be observed if there is to be any clear reasoning. They are •the distinction between abstracts and concretes, e.g. between *immensitas* and *immensum*; and •the distinction between ideas and things, e.g. between our notion of immensity (which is in our minds) and the real immensity (which actually exists outside us). [The two Latin words mean, respectively, 'immensity' and 'the immense thing' or 'that which is immense'. For brevity's sake, *immensum* will be retained throughout this passage.]

The only ideas that anyone has had—and I think they are the only ones anyone *can* have—about the nature of space are that it is:

- absolutely nothing,
- a mere idea,
- a relation of one thing to another,
- a body,
- some other substance, or
- a property of a substance.

·Let us look at these in turn·. Very obviously space is not absolutely nothing; for there can't be any quantity or dimensions or properties of *nothing*. . . .

It is equally clear that space isn't a mere idea. For no idea of space can possibly be formed larger than finite, but reason demonstrates that it is a contradiction for space itself not to be actually infinite. That space is not a mere relation of one thing to another, arising from their situation or order among themselves, is no less apparent; because space is a quantity and relations (such as situation and order) are not; as I shall show at length in (54) below. . . .

That space is not a body is also most clear. For if it were, then this body would be necessarily infinite. Also, if space were a body, every space would put up resistance to motion,

which we find from experience is not so.

That space is not any kind of substance is no less plain. The reason is that 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*; whereas infinite substance is *aeternum*, not *aeternitas*. So space must be a property, since none of the alternatives is tenable. . . .

END OF CLARKE'S LONG FOOTNOTE

[Clarke dismisses Leibniz's 49–51 as verbal quibbling.]

To Leibniz's 52, 53 <38>

I had argued for the view that •space doesn't depend on body on the grounds that •it is **possible** for the material universe to be finite and movable. Leibniz doesn't adequately counter that argument when he says that it wouldn't have been **wise and reasonable** for God to make the material universe finite and movable. He has only two options: to assert that it was **impossible** for God to make the material world finite and movable, or to admit that my argument succeeds. . . .

To Leibniz's 53 <38>

Leibniz is forced here to admit the difference between absolute real motion and relative motion—doesn't that necessarily imply that space is really a quite different thing from the situation or order of bodies? The reader can judge for himself, after comparing what Leibniz says here with what Newton has said in his *Principia*, book 1, definition 8.

To Leibniz's 54 <38>

I had said that time and space are quantities, which situation and order are not. Leibniz replies to this that 'order has its quantity; there's what goes first and what follows; there's distance or interval.' I answer that 'going first and following' constitutes situation or order; but the distance, interval or

quantity of time or space in which one thing follows another is entirely different from the situation or order, and doesn't constitute any *quantity* of situation or order: the situation or order can be the same when the quantity of time or space intervening is very different. Leibniz further replies that ratios or proportions have their quantity; and therefore time and space can do so as well, even if they are nothing but relations. My answer to that has two parts. (1) Even if it were true that some particular sorts of relations (e.g. ratios or proportions) are quantities, it doesn't follow that situation and order, which are relations of a quite different kind, are also quantities. (2) Proportions are not quantities; they are the proportions *of* quantities. If they were themselves 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 to 1* to *the proportion of 1 to 1* you get *the proportion of 1 to 1*. [Clarke elaborates this and related numerical matters at considerable length, and then comes to the main point:] The space of a day bears a much greater proportion to an hour than it does to half a day; and yet it remains, despite these two proportions, the same unvaried quantity of time. So time (and space, by the same argument) has the nature not of a proportion but of an absolute and unvaried quantity with different proportions. . . .

[Clarke has little to say about Leibniz's 55–72. <pages 39–41> He says that Leibniz (56) contradicts himself by allowing that God could have created the world sooner than he did and then going on to say that this makes no sense. [Clarke seems regularly to misunderstand Leibniz's use of the *reductio ad absurdum* form of argument.] Regarding Leibniz's 70, he protests against the claim that 'the will of God when it chooses one out of many equally good ways of acting' is like 'Epicurus's chance'.

'No two things can possibly be more different', Clarke says, 'than •the creation of the universe and •something that involves no will, no thought, no active principle at all'. All he says about the other sections in **55–72** consists of a series of references to earlier sections of this present paper, where he says they are answered.

To Leibniz's 73–5 <41>

On the question of whether space is independent of matter, and whether the material universe can be finite and movable, [Clarke mainly repeats what he said about this in his section on Leibniz's **52, 53** above, though his own references are to his comments on Leibniz's **1–20** and **26–32**. He also says this:] As for the opinion of those who contend (**75**) that the world might possibly be eternal through God's exercising his eternal power, this is utterly irrelevant to the matter we are now discussing.

[Clarke has nothing new to add in reply to Leibniz's **76–8**]

To Leibniz's 79–82 <42>

Everything Leibniz says in **79–80** is mere verbal quibbling. The existence of God (as I have repeatedly said) causes space; and all other things exist *in* that space. So it is also the place of ideas, because it is the place of the substances in whose minds the ideas exist. Regarding the idea that the soul of man (**81**) is the soul of the images of the things that it perceives: I brought this in a comparative way as an instance of a ridiculous notion—I was saying that it was no more absurd than something that Leibniz had said. But he, comically, argues against it as though it were something I had asserted! [Then a final exasperated mention of the notion of *sensorium*.]

To Leibniz's 83–91 <42–44>

Four things that I don't understand at all:

(**83**) The soul is a representative principle [= 'source of representations'];

(**87**) Every simple substance is by its nature a concentration and living mirror of the whole universe;

(**91**) A simple substance is a representation of the universe according to its point of view;

All simple substances will always be in harmony with one another because they always represent the same universe.

[What Clarke says about other sections in this group of nine mostly consists of references to things he'll say later (especially in his comments on Leibniz's **110–16** below), and complaints about Leibniz's asserting things without proving them.]

To Leibniz's 92 <44>

Leibniz holds that all the motions of our bodies are necessary, and are (**92, 95, 116**) caused entirely by mere mechanical impulses of matter that are wholly independent of the soul. I can't help thinking that this tends to introduce necessity and fate. It tends to make men be thought as mere ·mindless· machines, as Descartes imagined beasts to be; because it cuts the ground out from under any inference from •the actions of men to •the conclusion that a man contains a soul, or indeed anything more than mere matter. See my comments on Leibniz's **110–116**, below.

To Leibniz's 93–5 <44>

I contended that every action is the giving of a new force to the thing that is acted on. Leibniz objects against this that when two equal hard bodies strike each other, they bounce back with the same force, and that therefore their action on each other doesn't give any new force. It might be sufficient to reply that neither of the bodies bounces back with *its own* force, but each loses its own force and bounces back with a

newly acquired force that was impressed on it by the other body. (That is, by the other body's elasticity: a point that Leibniz doesn't mention is that if the bodies are not elastic they won't bounce back at all.) But the trouble goes deeper than that. A mere mechanical communication of motion is not strictly an action; it involves only passiveness both in the body that pushes and the one that is pushed. *Action* is the *beginning* of a motion where before there was no motion, this being done by a source of life or activity. If God or man, or any living or active power, ever influences anything in the material world, so that not everything that happens is mere absolute mechanism, there must be a continual increase and decrease of the whole quantity of motion in the universe. Leibniz frequently denies this.

[At this point Clarke has a four-page footnote about *force* and how to measure it, saying that Leibniz's handling of this matter in one of his published papers exhibits scientific incompetence. The footnote won't be given here, but here is part of a helpful treatment of it by H. G. Alexander in the Introduction to his good edition of the Leibniz-Clarke papers (Manchester University Press, 1956):

Leibniz and his followers maintained that the 'force' of moving bodies should be measured by the product of mass and velocity squared (mv^2); the Cartesians and Newtonians contended that it should be measured by simply mass times velocity (mv). . . .

Both sides were to some extent right. . . . It became clear that both concepts were important. The product mv is called *momentum* and the product $1/2mv^2$ is called *kinetic energy*. What had appeared to some of the contestants as a dispute about facts was eventually seen to be a dispute as to which concept should be taken as basic in mechanics—and both were found to be indispensable.

The concept of momentum is, for example, useful in considering the collision of inelastic bodies; since in such collisions momentum is conserved but not kinetic energy. On the other hand, in experiments where work is done against such forces as gravity, considerations of energy are more important. Leibniz therefore draws his examples from cases such as raising weights while his critics consider experiments with colliding bodies.]

To Leibniz's 96, 97 <44>

Here Leibniz refers only to what he has said elsewhere: and I am willing to do the same.

To Leibniz's 98 <44>

If the soul is a substance that fills the sensorium—i.e. the place at which it perceives the images of things that are conveyed to it—it doesn't follow that the soul must consist of corporeal parts (for the parts of body are distinct substances that don't depend on each other). Rather, the whole soul sees, the whole hears, the whole thinks, because it is essentially one individual.

To Leibniz's 99 <45>

In order to show that the active forces in the world (meaning the quantity of motion or impulsive force given to bodies) do not naturally diminish, Leibniz urges that when two **soft** inelastic bodies collide with equal and opposite forces, the only reason each loses its motion as a whole is that that motion is communicated and dispersed into a motion of its small parts. But the question is: when two perfectly **hard** inelastic bodies lose their whole motion by colliding, *then* what becomes of the motion or active impulsive force? It can't be dispersed among the parts, because the parts have no elasticity and so can't tremble or in any other way soak up

the motion that the whole body had before the collision. . . . Given the demonstration that I cited from Newton, Leibniz eventually (99) has to admit that the quantity of motion in the world is not always the same; so he takes refuge in the claim that motion and force are not always the same in quantity. But this is also contrary to experience. The force we are dealing with here not •the *vis inertiae* [Latin = 'force of inertia'] of matter (which is indeed always the same for as long as the quantity of matter stays the same), but •the relative active impulsive force; which is always proportional to the quantity of relative motion as is constantly evident in experience except when some •experimental• error has been committed⁸. . . .

To Leibniz's 100-102 <45>

I have just shown that active force, in the sense I have defined, *does* naturally diminish continually in the material universe. It is obvious that this isn't a defect •in the way the universe was made•, because it's only a consequence of matter's being lifeless, without a moving capacity of its own, inactive and inert. The inertia of matter has two consequences:

- the one that Leibniz acknowledges: velocity decreases in proportion as quantity of matter increases, and that is indeed not a decrease in the quantity of motion; and also
- when solid and perfectly hard bodies with no elasticity collide with equal and opposite forces, they lose all their motion and active force

To Leibniz's 103 <45>

I have argued at length in my previous papers that none

of the things referred to here are defects, For why wasn't God at liberty to make a world that would •continue in its present form for as long *or as short* a time as he thought fit and would then •be altered (by changes that may be very wise and suitable, yet impossible perhaps to be performed by mechanism) into whatever other form he chose? And a second point: Leibniz said that •the universe can't diminish in perfection, that •there is no possible reason that 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. I said that it follows from all this that the world had to be both infinite and eternal. Whether it really does follow is something I am willing to leave to the judgment of learned people who will take the trouble to compare the papers.

To Leibniz's 104-6 <45>

We are now told (104) that space is not an •order or •situation but an •order of situations. But the objection still stands: that an order of situations is not a *quantity*, as space is. Leibniz refers to his 54, where he thinks he has proved that order is a quantity; and I refer to what I have said in my discussion of that section in the present paper, where I think I have proved that it is not a quantity. What he says (105) about time clearly amounts to the following absurdity:

- time is **only** the order of successive things, and yet it is truly a quantity because
- time is the order of successive things **and also** the quantity of duration intervening between each of the particulars succeeding in that order.

Which is an outright contradiction. To say (106) that 'im-

⁸ When I say 'proportional to the quantity of relative motion' I mean 'proportional to the quantity of matter and the velocity'. I am not using the concept that Leibniz parades •in one of his published works• of the quantity of matter and the *square* of the velocity. See my responses to Leibniz's 93-5 above.

mentality' doesn't signify boundless space, and that 'eternity' doesn't signify duration or time without beginning and end, strikes me as the assertion that words have no meaning! Instead of providing arguments about this, Leibniz refers us to what certain theologians and philosophers (who shared his opinion) have acknowledged; but that's not what we were discussing.

To Leibniz's 107-9 <46>

I said that with respect to God no one possible thing is more miraculous than any other, so that what makes an event a *miracle* is not its being intrinsically hard ·for God· to do, but merely its being something that it is unusual for God to do. The terms 'nature', 'powers of nature', 'course of nature' and the like are nothing but empty words; all they say is that the item to which they are applied usually or frequently happens. 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'; but our only basis for this is that one of two is something God does •unusually whereas the other he does •usually. [He offers more examples. Then:] These are the 'weighty reasons' that Leibniz (108) demands; he offers nothing to counter them, and continues to rely on mentions of the vulgar forms of speaking of certain philosophers and theologians—which, I repeat, are not what we were discussing.

To Leibniz's 110-116 <46-7>

It's very surprising that on a topic that concerns •reason rather than •authority, Leibniz still (110) refers us to the opinions of certain philosophers and theologians. But I'll say no more about that. What does Leibniz mean (110) by an 'intrinsic real difference' between

what is miraculous and what isn't?

or (111) between

natural operations and ones that are not natural, this being understood with regard to God?

Does he think that God has two different and really distinct sources or powers of acting, of which one is more difficult for him to operate than the other? If not, then there's a choice between two ways to go.

1. In describing actions of God's as 'natural' or 'supernatural', we mean this relative to ourselves; we are calling a usual effect of God's power 'natural', and an unusual one 'supernatural';

the (112) 'force of nature' being a mere empty phrase. [In his 112 Leibniz doesn't use that phrase, but he does use 'natural powers'.]

2. We count as 'supernatural' anything that God does •immediately himself; and we count as 'natural' anything that he does •mediately through the instrumentality of second causes.

[The phrase 'second causes' standardly meant exactly what it means here: causes that come *second* in the causal chain from God's action to the effect in question; second causes are just ordinary worldly causes.] Distinction (1) is what Leibniz says he is opposing, but he ·also· explicitly rejects distinction (2) in 117, where he allows that angels may work true miracles. But I don't think there is any other conceivable way of drawing the natural/supernatural line.

It is very unreasonable to call (113) attraction a miracle, and an unscientific concept, after it has been so often clearly declared that by the term 'attraction' we mean to express *not* the •cause of bodies' tending towards each other but merely •the effect, the phenomenon itself, and the empirically discovered laws or proportions of that tendency, whatever its cause may be. [At this point Clarke has another long footnote which is presented here in the main text:]

START OF CLARKE'S LONG FOOTNOTE

Two passages from Newton, *Optics*, query 31: •'I don't inquire here into what the efficient cause is of these attractions. The phenomenon I call "attraction" may be caused by some kind of push, or in some other way that we don't know about. I use the word "attraction" merely to signify the force by which bodies tend towards each other, whatever the cause of that force may be. Before it is proper to ask what the cause of attraction is, we must first learn empirically what bodies attract each other and what are the laws and properties of attraction.' •'I consider these principles not as occult qualities that are imagined to arise from the "specific forms" of things, but as universal laws of nature, according to which the things themselves were formed. The phenomena of nature show that such principles really do exist, though we don't yet know what causes them. To affirm that every distinct species of things is endowed with "specific occult qualities" by means of which the things have certain active forces—this is saying nothing. But to deduce from the phenomena of nature two or three general principles of motion, and then to explain how the properties and actions of all bodies follow from those principles—this would be great progress in science, even if the causes of those principles were not yet discovered.' And one from his *Principia*, General Scholium: •'I haven't yet been able to deduce from the phenomena the cause of the property of gravity; and I don't make up hypotheses.' [Here 'make up' translates *fungo*, which often carries the sense of fabrication or contrivance or artificiality. Its past participle is *factum*, which is the source of our word 'fiction'.]

END OF CLARKE'S LONG FOOTNOTE

And it seems even more unreasonable •not to admit 'gravitation' and 'attraction' in this sense, in which it obviously *is* an actual phenomenon of nature, and yet •to expect acceptance of such a strange hypothesis as that of (109, 92, 87, 89, 90)

the pre-established harmony, according to which the soul and body of a man have no more influence on each other's motions and states than two clocks that are miles apart yet keep the same time without at all affecting each other. •Leibniz admittedly has an explanation for the harmony. He says (92) that God, foreseeing the inclinations of every man's soul, set up the great machine of the material universe at the outset in such a way that purely through the necessary laws of mechanism suitable motions would be caused in human bodies as parts of that great machine. But is it possible that the kinds and variety of movements that human bodies make should be made by mere mechanisms, without any influence of will and mind upon them? Is it credible that when a man has it in his power to decide a month ahead what he will do at a particular moment, his body will move appropriately when that moment comes, doing this through the mere power of mechanism on the basis of how things were set up when the material universe was created? •And this incredible hypothesis is intellectually destructive. •If Leibniz is right about the pre-established harmony, all scientific arguments based on phenomena and experiments are at an end. For if the pre-established harmony theory is true, a man doesn't actually see, hear or feel anything, nor does he move his body; he only *dreams that* he sees, hears and feels, and that he moves his body. •Also, if the world can be persuaded that a man's body is a mere machine, and that all his seemingly voluntary motions are performed by the necessary laws of corporeal mechanism with **no** input from his soul, it won't take them long to conclude that this machine is the whole man, and that the harmonical soul [Clarke's ironical phrase] in the hypothesis of pre-established harmony is merely a fiction and a dream. Anyway, what difficulty is being avoided by this strange hypothesis? It's just that it seems to be inconceivable how immaterial substance should act on

matter. But isn't God an immaterial substance? And doesn't *he* act on matter? Also, what greater difficulty is there in conceiving how •an immaterial substance should act upon matter than in conceiving how •matter acts on matter? Isn't it as easy to conceive how this should be the case:

certain parts of matter are be obliged to follow the motions and states of the soul, without corporeal contact,

as it is to conceive how *this* should be the case:

certain portions of matter are obliged to follow each other's motions through the adhesion of parts,

which no mechanism can account for; or to conceive how

rays of light reflect regularly from a surface that they never touch?

This last is something of which Newton in his *Optics* has given us several evident and ocular experiments. [Re 'adhesion of parts, which no mechanism can account for': This involves two points. (1) Ordinary impact mechanics makes sense only on the assumption that bodies hold together—e.g that when one billiard ball hits another, the tiny part that is actually hit moves away *and takes the rest of the ball with it*. (2) At that time, nobody had a credible account of *how* bodies hang together. The right explanation involves forces of attraction—real attraction, pulls that are not pushes in disguise—but in the early 18th century no scientist or philosopher could tolerate that. We have seen that Newton himself took care to keep it at arm's length.]

And it is just as surprising to find (115-6) this assertion again explicitly made, that after the first creation of things the continuation of the motions of the heavenly bodies, and the formation of plants and animals, and every motion of the bodies both of men and all other animals, is as mechanical as the motions of a clock. Someone who accepts this has (I think) an intellectual obligation to be able to explain in detail •by what laws of mechanism the planets and comets can continue to move in the orbs they do through unresisting

spaces, •by what mechanical laws both plants and animals are formed, and •and how the infinitely various spontaneous motions of animals and men are performed. I am quite convinced that this *can't* be shown, any more than one could show how a house or city could be built, or the world itself at first formed, by mere mechanism without any thinking and active cause. Leibniz does explicitly allow that things couldn't be initially produced by mechanism; but once he has conceded *that*, why does he display such a great concern to exclude God's actual government of the world, and to allow his providence no further role except concurring in [= 'going along with'] things' doing just what they would have done by mere mechanism if left to themselves? And why should Leibniz think that God is under some obligation or constraint, either in nature or wisdom, never to bring about anything in the universe that a corporeal machine couldn't accomplish through mere mechanical laws, after it is once set going? I can't conceive any answer to either question.

To Leibniz's 117 <47>

Leibniz's allowing here that true miracles are greater and lesser, and that angels can perform some true miracles, is flatly contradictory to the view about the nature of miracles that he has defended all through these papers.

To Leibniz's 118-23 <48-48>

Here is a phenomenon, an actual matter of fact, that we have learned from experience:

•The sun attracts the earth through the empty space between them; i.e. the earth and sun gravitate towards each other, or tend towards each other (whatever the cause of that tendency might be) with a force that is directly proportional to their masses. . . , and inversely proportional to the square of the distance between them.

- The space between sun and earth is empty, i.e. it has nothing in it that perceptibly resists the motion of bodies passing through it.

This is all that is meant by ‘attraction’ and ‘gravitation’. That this phenomenon is not produced (118) *sans moyen* [Leibniz’s phrase; see note on 45 on page 27], i.e. without some cause capable of producing such an effect, is undoubtedly true. Scientists are free to search for and discover that cause, if they can, whether or not it is mechanical. But if they can’t discover the cause, does that make the effect—the phenomenon or matter of fact discovered by experience—any 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? [‘manifest’ = ‘out in the open’; ‘occult’ = ‘hidden’.] When a body (123) moves in a circle without flying off on a tangent, it is certain that something hinders it from doing so; but if in some cases that ‘something’ is not mechanically explicable or hasn’t yet been discovered, does it follow that the phenomenon itself is false? This is very strange arguing!

To Leibniz’s 124–30 <48–49>

The phenomenon itself—the attraction, gravitation, or tendency of bodies towards each other, call it what you will—and the laws or proportions of that tendency are now sufficiently known by observations and experiments. But in the meantime it strikes me as a very extraordinary method of reasoning (128) to compare •gravitation (which is a phenomenon or actual matter of fact) with •Epicurus’s swerving of atoms (which, according to his corrupt and atheistic perversion

of some older and better philosophy, was an hypothesis or fiction only, and an impossible one at that, in any world where no intelligence was supposed to be present). If Leibniz or anyone else can (124) explain these phenomena by the laws of mechanism, he won’t be contradicted, and will indeed have the abundant thanks of the learned world. As to the grand principle (125) of a sufficient reason; all that Leibniz adds here concerning it are assertions of it, not arguments in support of it; so it doesn’t need an answer. I’ll just remark that ‘sufficient reason’ is ambiguous: it can be understood to mean •necessity only, or to include •will and choice as well. It is undoubtedly true that in general there (125) is a sufficient reason why everything is as it is; everyone agrees about that. But the questions are these:

- Mightn’t there be cases where it would be highly reasonable to act, but yet different possible ways of acting are equally reasonable?
- In such a case, mightn’t God’s will be itself a sufficient reason for acting in this or that particular manner?
- Even when there are the strongest possible reasons all together on one side, isn’t the source of action. . . something else, distinct from the motive or reason that the agent has in mind?

Leibniz repeatedly answers No to each of these. And when he (20, 25, etc.) lays down his grand principle of sufficient reason in such a sense as to yield those answers, expecting it to be granted to him *in that sense*, without proof, that is what I call his *petitio principii*—his begging of the question—and nothing can be more unphilosophical.