

LETTERS, 1661-1663

tial and more neatly put than those I have here recalled. I therefore take all the blame on myself, and absolve the Author entirely.

20 I proceed now to the things which are between you and me. And right away may I ask whether you have finished that little work of such great importance, in which you treat of the origin of things, their dependence on the first cause, and the Emendation of our intellect. I certainly believe, Dearest Sir, that to Men who are really learned and wise nothing will be more pleasant or more welcome than a Treatise of that kind. A Man of your talent and understanding must look to  
25 that rather than to the things that please the Theologians of our age and fashion. For they have an eye more to their own interest than to truth. So by the compact of friendship between us, and by every duty of increasing and spreading [knowledge of] the truth, I adjure you not to begrudge or deny us your writings on these matters. Nevertheless,  
30 if something of greater importance than I foresee prevents you from publishing that work, I beg you to be good enough to share a summary of it with me in your letters. If you do me this service, you will find me a grateful friend.

The Very Learned Boyle is soon to publish other works,<sup>73</sup> which I shall send you by way of compensation. To these I shall also add  
35 others which will describe the whole Purpose of our Royal Society, to whose Council I belong (with twenty others) and whose secretary I am (with one other).  
IV/52

Lack of time prevents me from digressing now about other matters. Promising you all the loyalty that can come from an honest heart, and all the readiness to do you services that my weakness is capable of, I  
5 am, Most Excellent Sir,

London, 3 April 1663

Yours entirely,  
Henry Oldenburg

LETTER 12

B.D.S. TO THE VERY LEARNED AND EXPERT  
LODEWIJK MEYER, DOCTOR OF MEDICINE  
AND PHILOSOPHY

[NS: On the Nature of the Infinite]

Special Friend,

15 I have received your two Letters, one dated 11 January [1663] and delivered to me by our friend N. N., the other dated 26 March [1663]

<sup>73</sup> In 1663 Boyle published his *Considerations touching the usefulness of experimental natural philosophy* and *Experiments and considerations upon colours*.

and sent to me from Leiden by some friend, I know not whom. Both were very welcome to me, especially when I learned from them that everything is quite well with you and that you often think of me. For  
 20 your kindness to me and for the honor you have always been willing to do me, I return, as I am bound to do, very hearty thanks. At the same time I ask you to believe that I am no less devoted to you, as I shall always try to show at every opportunity, as far my slight abilities allow. To begin [showing my devotion], I shall take some pains to answer the question you put to me in your Letters. You ask me to tell  
 25 you what I have discovered about the Infinite, which I shall most gladly do.

IV/53 Everyone has always found the problem of the Infinite very difficult, indeed insoluble. This is because they have not distinguished between what is infinite as a consequence of its own nature, *or* by the force of its definition, and what has no bounds, not indeed by the  
 5 force of its essence, but by the force of its cause. And also because they have not distinguished between what is called infinite because it has no limits and that whose parts we cannot explain or equate [NS: determine or express] with any number, though we know its maximum and minimum [NS, LC: *or* it is determined]. Finally, they have not distinguished between what we can only understand, but not imagine, and what we can also imagine.

10 If they had attended to these distinctions, I maintain that they would never have been overwhelmed by such a great crowd of difficulties. For then they would have understood clearly what kind of Infinite cannot be divided into any parts, *or* cannot have any parts, and what kind of Infinite can, on the other hand, be divided into parts without contradiction. They would also have understood what kind of Infinite  
 15 can be conceived to be greater than another Infinite, without any contradiction,<sup>74</sup> and what kind cannot be so conceived. This will be clear from what I am about to say. But first let me briefly explain these four [concepts]: Substance, Mode, Eternity, and Duration.

IV/54 The points I want you to consider about Substance are: (i) that existence pertains to its essence, i.e., that from its essence and definition alone it follows that it exists (if my memory does not deceive me, I have previously demonstrated this to you in conversation, without the aid of any other Propositions); (ii), which follows from (i), that  
 5

<sup>74</sup> In E IP15S, where Spinoza is discussing the arguments of those opponents who contend that extended substance cannot be infinite, he lets pass, without challenging it, their assumption that it is absurd to suppose that one infinite can be greater than another. This tempts us to think that Spinoza accepts that part of the opponent's argument. This passage warns us not to argue from silence in that way.

Substance is not one of many, but that there exists only one of the same nature; and finally, (iii) that every Substance can be understood only as infinite.

10 I call the Affections of Substance Modes. Their definition, insofar as it is not the very definition of Substance, cannot involve any existence. So even though they exist, we can conceive them as not existing. From this it follows that when we attend only to the essence of modes, and not to the order of the whole of Nature [LC: matter], we cannot  
15 infer from the fact that they exist now that they will or will not exist later, or that they have or have not existed earlier. From this it is clear that we conceive the existence of Substance to be entirely different from the existence of Modes.

IV/55 The difference between Eternity and Duration arises from this. For it is only of Modes that we can explain the existence by Duration. But [we can explain the existence] of Substance by Eternity, i.e., the infinite enjoyment of existing, *or* (in bad Latin) of being.

5 From all this it is clear that when we attend only to the essence of Modes (as very often happens), and not to the order of Nature, we can determine as we please their existence and Duration, conceive it as greater or less, and divide it into parts—without thereby destroying in any way the concept we have of them. But since we can conceive  
10 Eternity and Substance only as infinite, they can undergo none of these without our destroying at the same time the concept we have of them.

Hence they talk utter nonsense, not to say madness, who hold that Extended Substance is put together of parts, *or* bodies, really distinct from one another. This is just the same as if someone should try,  
15 merely by adding and accumulating many circles, to put together a square or a triangle or something else completely different in its essence. So that whole array of arguments by which Philosophers ordinarily labor to show that Extended Substance is finite falls of its  
IV/56 own weight. For they all suppose that corporeal Substance is composed of parts. Similarly there are others, who, after they have persuaded themselves that a line is composed of points, have been able to find many arguments by which they would show that a line is not divisible to infinity.

5 But if you ask why we are so inclined, by a natural impulse, to divide extended substance, I reply that we conceive quantity in two ways: either abstractly, *or* superficially, as we have it in the imagination with the aid of the senses; or as substance, which is done by the  
10 intellect alone. So if we attend to quantity as it is in the imagination, which is what we do most often and most easily, we find it to be

divisible, finite, composed of parts, and one of many. But if we attend to it as it is in the intellect, and perceive the thing as it is in itself, which is very difficult, then we find it to be infinite, indivisible and unique, as [NS: if I am not mistaken] I have already demonstrated sufficiently to you before now.

Next, from the fact that when we conceive Quantity abstracted from Substance and separate Duration from the way it flows from eternal things, we can determine them as we please, there arise Time and Measure—Time to determine Duration and Measure to determine Quantity in such a way that, so far as possible, we imagine them easily. Again, from the fact that we separate the Affections of Substance from Substance itself and reduce them to classes so that as far as possible we imagine them easily, arises Number, by which we determine [these affections of substance].

You can see clearly from what I have said that Measure, Time, and Number are nothing but Modes of thinking, or rather, of imagining. So it is no wonder that all those who have striven to understand the course of Nature by such Notions—which in addition have been badly understood—have so marvelously entangled themselves that in the end they have not been able to untangle themselves without breaking through everything and admitting even the most absurd absurdities. For since there are many things which we cannot at all grasp by the imagination, but only by the intellect (such as Substance, Eternity, etc.), if someone strives to explain such things by Notions of this kind, which are only aids of the Imagination, he will accomplish nothing more than if he takes pains to go mad with his imagination.

And if the Modes of Substance themselves are confused with Beings of reason of this kind, *or* aids of the imagination, they too can never be rightly understood. For when we do this, we separate them from Substance, and from the way they flow from eternity, without which, however, they cannot be rightly understood.

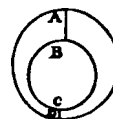
To see this still more clearly, take this example. When someone has conceived Duration abstractly, and by confusing it with Time begun to divide it into parts, he will never be able to understand, for example, how an hour can pass. For if an hour is to pass, it will be necessary for half of it to pass first, and then half of the remainder, and then half of the remainder of this. So if you subtract half from the remainder in this way, to infinity,<sup>75</sup> you will never reach the end of the hour. Hence many, who have not been accustomed to distinguish Beings of reason from real beings, have dared to hold that Duration

<sup>75</sup> NS: *onbepaaldelijk/indeterminaté*, LC: *indefinité*, indefinitely.

is composed of moments. In their desire to avoid Charybdis, they have run into Scylla [NS: or gone from bad to worse]. For composing Duration of moments is the same as composing Number merely by adding noughts.

From what has just been said it is sufficiently evident that neither Number, nor Measure, nor Time (since they are only aids of the imagination) can be infinite. For otherwise Number would not be number, nor Measure measure, nor Time time. Hence it is clear why many who confused these three with the things themselves, because they were ignorant of the true nature of things, denied an actual Infinite. But let the Mathematicians judge how wretchedly these people have reasoned—such Arguments have never deterred the Mathematicians from the things they perceived clearly and distinctly. For not only have they discovered many things which cannot be explained by any Number—which makes quite plain the inability of numbers to determine all things—they also know many things which cannot be equated with any number, but exceed every number that can be given. Still they do not infer that such things exceed every number because of the multiplicity of their parts, but because the nature of the thing cannot admit number without a manifest contradiction.

For example, all the inequalities of the space between two circles, A and B,<sup>76</sup> and all the variations which the matter moving in it must undergo, exceed every number. That is not inferred from the excessive size of the intervening space. For however small a portion of it we take, the inequalities of this small portion will still exceed every number. Nor is it inferred because, as happens in other cases, we do not know its maximum and minimum. For we know both in this example of ours: AB is the maximum and CD is the minimum. Instead it is inferred simply from the fact that the nature of the space between two non-concentric circles does not admit anything of the kind. So if anyone should wish to determine all those inequalities by some definite number, he will, at the same time, have to bring it about that a circle is not a circle.



Similarly, to return to our theme, if someone should wish to determine all the motions of matter there have been up to now by reducing them and their Duration to a definite number and time, he will certainly be striving for nothing but depriving corporeal Substance (which we can not conceive except as existing) of its Affections and bringing it about that it does not have the nature which it has. I could dem-

<sup>76</sup> Following AHW who here follow the NS more closely than either of the Latin texts. The example recurs in *Descartes' Principles* (I/198-199), and is discussed by Tschirnhaus and Spinoza in Letters 80 and 81 and by Gueroult in Grene, 203-209.

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15 onstrate this clearly here—as well as many other things I have touched on in this Letter—but I judge it to be unnecessary.

IV/61 From everything now said, it is clear that some things are infinite by their nature and cannot in any way be conceived to be finite, that others [are infinite] by the force of the cause in which they inhere, though when they are conceived abstractly they can be divided into parts and regarded as finite, and that others, finally, are called infinite, or if you prefer, indefinite, because they cannot be equated with any number, though they can be conceived to be greater or lesser. For if 5 things cannot be equated with a number, it does not follow that they must be equal. This is manifest enough from the example adduced, and from many others.

I have, finally, set out briefly the causes of the errors and confusions 10 which have arisen concerning the Problem of the Infinite, and unless I am mistaken, I have so explained all of them that I do not think any Problem about the Infinite remains which I have not touched on here or which cannot be solved very easily from what I have said. So I don't regard it as worthwhile to detain you any longer with these matters.

15 But in passing I should like to note here that the more recent Peripatetics have, as I think, misunderstood the demonstration by which the Ancients tried to prove God's existence. For as I find it in a certain IV/62 Jew, called Rab Chasdai,<sup>77</sup> it runs as follows: if there is an infinite regress of causes, then all things that are will also have been caused; but it does not pertain to anything which has been caused, to exist necessarily by the force of its own nature; therefore, there is nothing in Nature to whose essence it pertains to exist necessarily; but the 5 latter is absurd; therefore, the former is also. Hence the force of this argument does not lie in the impossibility of there being an actual infinite or an infinite regress of causes, but only in the supposition that things which do not exist necessarily by their own nature are not determined to exist by a thing which does necessarily exist by its own 10 nature [NS: and which is a cause, not something caused.]

Because time forces me to hasten, I would now pass to your second Letter, but I will be able to answer the things contained in it more conveniently when you are good enough to visit me. So I ask you, if 15 you can, to come as soon as possible. For the time of my moving approaches rapidly. That is all. Farewell, and remember me, who am, etc.

[Rijnsburg, 20 April 1663]

<sup>77</sup> Chasdai Crescas (c.1340-c.1410), a Spanish critic of the Aristotelian Maimonides. See Wolfson 3.