

Leibniz's Argument for the Identity of Indiscernibles in his Letter to Casati (with Transcription and Translation)¹

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Leibniz's short letter to the mathematician and physicist Ludovico Casati of 1689 is a short but interesting text on the Principle of Identity of Indiscernibles, to which it is entirely dedicated. Since there is no watermark in the paper of the letter, the letter is difficult to date, but it is likely that it was written during Leibniz's stay in Rome, sometime between April and November of 1689 (A 2 2 287–8).² When addressing the letter, Leibniz wrote 'Casani', but this seems to be a mistake and the real addressee is thought to be Ludovico Casati, nephew of Paolo Casati, the Jesuit mathematician. The letter, reproduced in the Berlin's Academy edition of Leibniz's works, was first published by Gerhardt in the *Archiv für Geschichte der Philosophie* in 1892 (Gerhardt 1892: 53–54). It also appears in Robinet's *Iter Italicum* (Robinet 1988: 134–35). But neither Gerhardt nor Robinet provide a philosophical discussion of the letter, and I am not aware of any other philosophical discussion of it. Furthermore, as far as I know, the letter has never been translated into any language. Thus I shall here provide a transcription (from A 2 2 288–89) and a translation of the letter into English, and a philosophical discussion of its treatment of the Identity of Indiscernibles.

Ad R.P. [Casati] Lectorem Theologiae in Collegio Clementino urbis Romae.

Quemadmodum optime ostensum est, *nullam esse determinationem pure extrinsecam*, hoc est nullam rem ad novam aliquam actionem determinari nisi excitetur nova aliqua ad agendum dispositio in ipsa; ita semper arbitratus sum *nullam dari differentiam pure extrinsecam*, hoc est (ne quis in verbis cavilietur) nunquam duas res inter se differre, quin discerni possint non tantum per extrinseca, sed etiam per ea quae sunt in ipsis. Res exemplo intelligetur clarius. Si duo dentur ova *A* et *B* posita in cista *CD*, sitque *A* ovum gallinae albae et *B* nigrae, eaque Ova sint admodum similia inter se et equalia, tunc utique licet per se discerni facile et primo aspectu non possint, poterunt discerni facillime ipso situ in cista, ut si unum *A* ponatur in loculamento cistae medio, alterum *B* in loculamento quod sit angulo vicinum; tunc optime poterunt discerni per differentiam hanc extrinsecam; dico tamen hanc differentiam extrinsecam duorum ovorum etsi nobis serviat, nihilominus in re non sufficere, sed supponere differentiam aliquam intrinsecam seu in ipsis ovis, adeoque non posse dari duo ova tam perfecte similia, ut nullum in iis discrimen notari possit, si attente considerentur aut perfecte perspicerentur.

Nimirum si diversa sunt *A* et *B* utique habebunt in se diversitatem, seu principium discernendi, in se inquam, abstrahendo animum ab externis. Nam fingamus externa omnia annihilari et duos globos materiales (quos nunc ovis substituam) solos superesse in spatio imaginario, tunc dico a nemine quancunque sit intellectus, nec ab angelo imo ne a Deo quidem istos duos globos perfecte aequales et similes posse discerni. Cum principium discernendi non sit in ipsis (ex hypothesi adversariorum), nec in externis ex hypothesi sublatorum externorum, nec partes spatii imaginarii quibus circumdantur globi queant discerni inter se. Absurdum autem est dari duo diversa, quae ne ab infinito quidem intellectu discerni possint.

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To the Reverend Father Casati, Lecturer in Theology in the Clementine College of the city of Rome.

As it has been shown in the best way, *there is no purely extrinsic determination*, that is, no thing is determined to any new action unless a new disposition to act is activated in the thing itself; thus I have always been of the opinion that *there is no purely extrinsic difference*, that is (so that no one quibbles with words), that never are two things different from each other unless they can be distinguished not only through what is extrinsic but also through those things which are in them. This can be understood more clearly through an example. If there were two eggs A and B in the basket CD, and egg A came from a white hen and egg B came from a black one, and those eggs were entirely similar and equal, then certainly even if they cannot be distinguished by themselves easily and at first sight, they can most easily be distinguished through their place in the basket, for instance if one, A, were put within a receptacle in the centre of the basket, and the other, B, were put in a receptacle that is near to a corner; in that case they can be most effectively distinguished through this extrinsic difference; however I say that although this extrinsic difference between the two eggs is useful to us, nevertheless it is not sufficient in reality, but it presupposes some intrinsic difference or in the eggs themselves, and thus there cannot be two eggs so perfectly similar that no difference in them could be observed, if they were attentively examined or fully inspected.

Certainly, if A and B are diverse then without doubt they will have a diversity, or a principle of distinction, in themselves; *in themselves*,³ I emphasise it so as not to have to think of external objects. For let us suppose that all external objects are annihilated and that two material spheres (with which I shall now replace the eggs) remain alone in imaginary space, then I say that by no one, however great be his intellect, indeed neither by an angel nor even by God, can these two perfectly equal and similar spheres be distinguished. For the principle of distinction would not be in themselves (given the hypothesis of the opponents), or in external objects given the hypothesis of the removal of external objects, nor can the parts of imaginary space that surround the spheres be distinguished from each other. But it is absurd that there are two distinct things, which cannot be distinguished even by an infinite intellect.

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Atque haec per experientiam confirmantur, nunquam enim ovum ovo, lac lacti, folium folio, animal animali, et generaliter res rei ita similis reperietur, quin accurata inspectione facta discrimen aliquod notari possit; quod in foliis arborum et graminibus hortorum aliquando inter deambulandum a foemina principe magni ingenii jucunde observatum memini.

Et sane ut a corporibus ad intelligentias transeamus, D. Thomas praeclare notavit, non posse dari duas intelligentias separatas perfecte inter se similes, et licet perfectam similitudinem in corporibus dari posse putarit, hoc tamen ex natura materiae non satis ejus temporibus perspecta natum est. Et fortasse tantum voluit dari corpora quae specie non differant, etsi aliter dissimilia sint.

Quod vero ad animas attinet, equidem verum est Humanas Mentis inter se non differre in specie, non tamen hinc inferri debet, eas perfecte similes esse, multa enim quae in specie non differunt, nihilo minus discerni per se posse constat, magnitudine, gradu, variisque proportionibus ut duo homines lineamentis vultus dignoscuntur. Et licet plurimum discriminis in mentibus oriatur ex iis quae corporibus quibus uniuntur accidunt, attamen dicendum est, primo statim infusionis instanti differre animas, nec adeo ullum momentum dari, quo sint perfecte similes. Et certe inter Christi et Judae animas per se spectatas nullum aliquando fuisse discrimen non sine absurditate dici posse videtur. Adeoque tuto sine ullo censurae metu defendere poterimus duas animas perfecte inter se similes nunquam dari, idemque in universum in rebus verum esse. Ex qua jam veritate multa alia momenti maximi, de quibus alias, consequuntur.

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And these things are confirmed by experience, for never will be found two eggs, or two drops of milk, or two leaves, or two animals, and in general two things so similar that after an accurate inspection, a difference cannot be detected; which, as I remember, was once pleasantly observed by a princess of great talent, while she was having a walk, of the leaves of the trees and the blades of grass of the garden.

And indeed, so that we pass from bodies to intelligences, the divine Thomas remarked very clearly that there cannot be two separate intelligences that are perfectly similar to each other, and even if he thought that there can be perfect similarity in bodies, this originated, nevertheless, in the fact that at his time the nature of matter was not sufficiently understood. And perhaps he only intended that there are bodies that do not differ in species, even if they are dissimilar in another way.

Indeed as far as souls are concerned, it is of course true that human minds do not differ between each other in species, nevertheless from this it must not be inferred that they are perfectly similar, for many which will not differ in species, as it is well known, can be distinguished by themselves by their greatness, degree, and different relations as two men are distinguished by the features of the face. And even if most of the difference between minds has its origin in those things that happen to the bodies with which they are united, nevertheless it must be said that souls differ from each other from the very first moment of their infusion, and that, indeed, there is no moment at which they are perfectly similar. And, certainly, it seems that it cannot be said without absurdity that there has been any time at which there was no difference between the souls of Christ and Judas when they are observed in themselves. And thus we can defend in a safe way and without any fear of criticism that there are never two perfectly similar souls, and the same is true of things in general. Now from this truth many other things of the greatest importance follow, about which I shall speak at another occasion.

Discussion

One interesting thing about this letter is that in it Leibniz comes very close to anticipating Max Black's classic example of a possible world containing just two indiscernible spheres (Black: 1952: 156). But the situation with two indiscernible spheres Leibniz envisages is not the same as Black's. Indeed Black considered a situation in which all there was and *there had been* were just two perfectly similar spheres. The situation Leibniz considers is one in which at one point there are many objects all of which, except for two perfectly similar spheres, are then annihilated. As we shall see below, this is a significant difference.

It is also interesting to compare the argument of the letter with the argument for the Identity of Indiscernibles Leibniz gives in the correspondence with Clarke:

I infer from [the Principle of Sufficient Reason] ... that there are in nature no two real absolute beings that are indiscernible: because if there were, God and nature would act without reason, in treating the one otherwise than the other; and that so God does not produce two pieces of matter perfectly equal and alike (G VII 393).

Both arguments use God, but while in the argument from the Correspondence with Clarke God figures as a being with a rational will who would not be able to choose a possible world containing indiscernibles, in the letter to Casati God figures as a being with an infinite intellect who would not be able to distinguish indiscernible things. Thus Leibniz's argument from the Correspondence with Clarke does not question the intelligibility or the consistency of possible worlds with indiscernible things, while the argument from the letter to Casati attempts to establish the absurd character of such worlds. Thus it is clear that in the letter to Casati Leibniz takes the Identity of Indiscernibles to be necessary.⁴ For he claims that 'there *cannot be* two eggs so perfectly similar that no difference in them could be observed, if they were attentively examined or fully inspected' (my italics). Furthermore he claims that what he takes to be a consequence of the violation of the Principle of Identity of Indiscernibles is absurd, which strongly suggests that he thought the principle to be necessary. And then he goes on to compare his view with Aquinas' view about separate intelligences, to whom he correctly attributes the view that 'there *cannot be* two separate intelligences that are perfectly similar to each other' (A 2 2 289; my italics).⁵

It may be argued that the fact that at the beginning of the letter Leibniz does not modalize his statement of the Identity of Indiscernibles ('never are two things

different from each other unless they can be distinguished not only through what is extrinsic but also through those things which are in them'), casts doubt on my assertion that Leibniz unambiguously saw the Identity of Indiscernibles as necessary in this letter. But apart from the fact that the non-modalized Identity of Indiscernibles is a logical consequence of the modalized version of it, which, as we saw, Leibniz asserts later in his letter, it must be noted that at the beginning of the letter Leibniz is connecting the Identity of Indiscernibles with the idea that there *is* no purely extrinsic denomination ('determination', as he says in this letter), an idea which is often expressed in a non-modalized way even if Leibniz has, in some works, the elements to affirm that there *cannot be* a purely extrinsic denomination. This is true of what Leibniz says in *Primary Truths*, since there the idea that there are no purely extrinsic denominations is ultimately derived from the principle that the concept of the predicate is included in the concept of the subject, which is, presumably, a necessary principle (A 6 4 1645–46). Similarly, in *On the principle of indiscernibles* Leibniz says that there are no purely extrinsic denominations, but at the end of the paper he says that all he has claimed in his piece follows from the great principle that the predicate is in the subject (C 10).

But what is Leibniz's argument for the Identity of Indiscernibles in this letter? It appears in the following passage:

... thus there cannot be two eggs so perfectly similar that no difference in them could be observed, if they were attentively examined or fully inspected.

Certainly, if A and B are diverse then without doubt they will have a diversity, or a principle of distinction, in themselves; *in themselves*, I emphasise it so as not to have to think of external objects. For let us suppose that all external objects are annihilated and that two material spheres (with which I shall now replace the eggs) remain alone in imaginary space, then I say that by no one, however great be his intellect, indeed neither by an angel nor even by God, can these two perfectly equal and similar spheres be distinguished. For the principle of distinction would not be in themselves (given the hypothesis of the opponents), or in external objects given the hypothesis of the removal of external objects, nor can the parts of imaginary space that surround the spheres be distinguished from each other. But it is absurd that there are two distinct things, which cannot be distinguished even by an infinite intellect (A 2 2 288–9; *my italics*).

It is important to note that this is not an epistemological argument. That is, Leibniz is not arguing that since facts of distinction between things obtain because God distinguishes or can distinguish the things in question, there are no distinct things that not even God could distinguish. On the contrary, Leibniz's passage is read more naturally as assuming that God's infinite powers of discrimination match independent facts of distinction between things. Thus this is how I understand the argument:

1. If, as a result of the annihilation of everything else, there remained just two perfectly resembling things in space, their principle of distinction would not be in themselves (since they would be perfectly similar), or in other objects (for there would be no other objects), or in the parts of space surrounding those objects (for such parts of space could not be distinguished from each other).⁶
2. Two distinct things could be distinguished only either through their intrinsic features, or through their relations to other objects, or through their relations to the parts of space.
3. Therefore, no one would be able to distinguish those things. (From 1 and 2).
4. Therefore, God would not be able to distinguish those things. (From 3).
5. God's intellect is infinite.
6. It is not possible that there are two distinct things that cannot be distinguished even by someone using an infinite intellect.
7. Therefore, it is not possible that there are two perfectly similar things. (From 4, 5 and 6).

Is this argument any good? Premise 1 seems plausible. Perfectly similar things do not differ from each other in virtue of how they are intrinsically and this is the point of saying that their principle of distinction is not within themselves. Such things might, nevertheless, differ extrinsically, namely in virtue of how they are in relation to other entities. But in a world where at a certain time everything, except two perfectly similar spheres, has been annihilated, there are no other entities to which those spheres are related at that time. Another way to distinguish perfectly similar things would be through spatial regions. But the regions they occupy, and the regions that surround them, cannot be distinguished from each other. So these regions cannot be used to distinguish those two spheres. Thus it seems that such spheres can be distinguished neither through any intrinsic features, nor through their relations to other objects, nor through the regions of their space. Thus premise 1 seems plausible, but I shall come back to it later.

There is nothing like premise 2 in the text, but I have supplied it because it is obvious that something like this is necessary to permit the inference to 3, which is explicitly stated in the text ('there cannot be two eggs so perfectly similar that no difference in them could be observed, if they were attentively examined or fully inspected'). 4 follows from 3, but the problem is that premise 2, from which 3 follows, is dubious if not false.

Premise 2 is plausible if one is considering situations in which the only existing things *have always been* two indiscernibles – that is, situations at which at no point in time have there been any other objects than those two indiscernibles. But this is not the situation Leibniz considers. Leibniz is considering a situation in which all other objects, except the spheres, have been annihilated. So it is not the case, in the relevant kind of situation, that the only existing things have always been two indiscernibles. And the kind of situation Leibniz is considering allows for dissimilar objects among those which have been annihilated. Thus in some such situations the two remaining spheres can be distinguished through their spatiotemporal histories. For at a certain time one of the spheres would, for instance, have been next to a pyramid, while the other would have been next to a tower, and then at the following moment the wind would have made the first sphere roll into the sea, while the second would have gone inside a cathedral, and so on. God, who knows everything, would have been aware of the different movements of the spheres and their different spatial relations to dissimilar things and so, after annihilating everything else (I take it for granted that for Leibniz God is the agent of annihilation), he would remember their respective, different histories, and use those histories to distinguish them. Indeed, if God's intellect is infinite, as Leibniz asserts later in the argument, there would seem to be no impediment for God to distinguish the spheres through their spatiotemporal histories.

Leibniz seems to be unaware of this line of thought against premise 2. But about 17 years earlier he had considered how to individuate two perfectly similar eggs (and, coincidentally, it is eggs that he is considering in the letter to Casati before he replaces them by the two spheres), and he comes to a view which naturally suggests how God could distinguish two perfectly similar eggs or spheres after everything else has been annihilated. Thus in the *Confessio philosophi*, a text where he rejected the Identity of Indiscernibles, Leibniz says that two perfectly similar eggs can only be distinguished through their spatial relations to other things:

For between these eggs no difference can be assigned either by an angel or, I have the audacity to say, by God (given the hypothesis of the greatest simi-

larity possible) other than at the present time this one is at place *A*, and that one is at place *B*. That is why, in order for you to be able to distinguish them continuously ... it is necessary either that you keep these eggs in some immobile container, where they themselves remain unchanged, or that you make their site or container, if it is mobile, unbreakable, and fix them in it, so that they retain the same relation always to certain previously determined marks imprinted on parts of the container, or, finally, if you are going to allow them total lack of restraint, you must continuously follow the motion of each, during the entire time period and through every place, either with your eyes or your hands or by some other kind of contact (A 6 3 147/S 105).

No doubt God would not follow the eggs with his hands, eyes, or another kind of contact. Basically God has to follow the eggs with his mind. But then, to distinguish the eggs or the spheres after the annihilation of everything else, all he needs to do is to remember their respective itineraries. It is puzzling, then, that in the letter to Casati Leibniz shows no awareness of this objection to one of the premises of his argument.

It should be noted that the idea that perfectly similar things can be distinguished through their histories is not the same as the Leibnizian idea that things express their pasts. As Leibniz understands this latter idea, it means that substances with different histories are qualitatively different, since the past of a substance leaves a trace in the present of the substance. The idea I am appealing to is much less substantive than this Leibnizian idea – it is the simple idea that God, who knows everything, can follow the spheres through time so that when he has annihilated all other objects he is in a position to distinguish them by remembering which one was nearer to what before he annihilated the other objects.

It might be objected that distinguishing the spheres through their histories is distinguishing them through other objects, even if they are only past objects. If so, the possibility of distinguishing the spheres through their histories does not threaten premise 2. And there seems to be some evidence that for Leibniz distinguishing the spheres through their histories would be to distinguish them through other objects. For according to Leibniz time is the order of bodies according to their successive position (G VII 376), and for Leibniz order is 'no other than a relation that distinguishes many things' (C 535), that is, 'a relation of many things, through which each one of them can be distinguished from each one of the others' (LH 124). This suggests that when there is order there is a relation between entities, and therefore there must be something past to which present things are related through time. This

entails that, whatever annihilation means, it does not entail that annihilated things cease to exist. This is difficult to make sense of. But, in any case, *if* this is what Leibniz meant, the problem lies in premise 1. For then the indiscernible things that remain after everything else has been annihilated have their principle of distinction in other objects, that is, they differ in virtue of how they are in relation to other entities – even if these other entities are past entities.

Premise 5 means, I suppose, that God is able to perform all possible intellectual tasks (where these include not only understanding, but also distinguishing, re-identifying, comparing, and many other tasks), and on that understanding of the infinity of God's intellect I relied on in my criticism of premise 2. Given the scope of this article, 5 is a premise we should be prepared to grant.

6 is a crucial premise, but it is a dubious one, and Leibniz does not provide any support for it. For Leibniz seems to assume, in premise 6, that an infinite intellect must be able to distinguish distinct things – that is, that distinct things must be distinguishable. But it is not clear that this is so. Why couldn't there be distinct things that cannot be distinguished even by an infinite intellect? Leibniz offers no answer to this question in the letter to Casati.

Thus to make this argument more effective Leibniz needs to give a reason for the claim that it is not possible that there are distinct things that cannot be distinguished by a being with an infinite intellect. One such reason might come from the Principle of Sufficient Reason, which does not appear at all in the letter to Casati. In this respect the argument from *Primary Truths*, a text written in the same period as the letter to Casati, represents an improvement over the argument from this letter. Indeed in *Primary Truths*, after arguing for the Principle of Sufficient Reason, Leibniz asserts that there cannot be two things that differ *solo numero* because it must be possible to give a reason why they are diverse, a reason that must be sought from some difference in themselves (A 6 4 1645). So there is always a reason why distinct things are distinct or, in other words, there is always a principle of distinction between distinct things. But reasons are intelligible, and so they are in principle accessible to intelligent beings. But then, if there is a reason why any two distinct things are distinct, there could be no two distinct things which could not be distinguishable by a being with an infinite intellect, since this being would understand the reason why they are diverse, and would thereby be in a position to distinguish them. But if there must always be a reason why distinct things are distinct, the idea that an infinite intellect must be able to distinguish distinct things is likely to become unnecessary in an argument for the Principle of Identity of

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Indiscernibles (it is no surprise, then, that such an idea does not appear in *Primary Truths*).

Finally it should be noted that the conclusion 7 does not follow from 4, 5, and 6. All that follows from 4, 5 and 6 is that it is not possible that God annihilates everything and leaves just two perfectly similar objects. Of course, the reasons why such a situation is impossible apply also to the situation envisaged by Black, in which it is always the case that there are two perfectly similar spheres and nothing else. Even so, rejecting these possibilities is not sufficient to establish the Principle of Identity of Indiscernibles. For all that has been said there could have been perfectly similar objects, provided there were other objects that helped to distinguish them and that not all of these were ever annihilated.

Thus the argument from the letter to Casati is invalid. Leibniz does not use this argument in any of his major works and, as far as I know, this letter is the only place where it appears. Perhaps this is because Leibniz saw some of the problems with the argument.

But perhaps Leibniz's argument is an enthymeme and what Leibniz had in mind was something like the following: since God can annihilate any number of creatures, if he could create a situation in which there are indiscernible things together with some discernible ones, he could create an impossible situation, because in that situation he cannot annihilate some things so as to leave only indiscernible things in existence (since if he did that, he would have created a situation in which an infinite intellect cannot distinguish distinct things, which is absurd), but he must be able, in every situation, to annihilate any number of things he pleases (since he is omnipotent and he is the master of his creation); but God could not create an impossible situation, for otherwise an impossible situation would be possible; therefore God cannot create indiscernible things and so indiscernibles are impossible (since situations in which there have always been only indiscernible things are also impossible). This might be a better argument than the one we have just discussed. However, there is nothing like this in the letter to Casati, so all we can say is that Leibniz could have argued in that way, but he did not do it. Furthermore, such an argument would share some premises with the argument we find in the text, and some of those premises, as we have seen, are dubious and unsupported.

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Abbreviations

- S: G. W. Leibniz. *Confessio philosophi. Papers Concerning the Problem of Evil, 1671–1678*, translated and edited by Robert C. Sleigh, Jr., with contributions from B. Look and J. Stam. New Haven and London: Yale University Press, 2005.
- Sententiarum*: Aquinas, T. In *Quattuor Libros Sententiarum*, in volume 1 of *S. Thomae Aquinatis Opera Omnia*, edited by Roberto Busa S.I. Stuttgart: Fromman–Hoolzbog, 1980.
- Summa Theologiae*: Aquinas, T. *Summa Theologiae*, in volume 2 of *S. Thomae Aquinatis Opera Omnia*, edited by Roberto Busa S.I. Stuttgart: Fromman–Hoolzbog, 1980.

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Notes

¹I am grateful to Juliane Kerkhecker, Massimo Mugnai, Cecilia Trifogli and Ezequiel Zerbudis.

² For the abbreviations I use in citing works of Leibniz and Aquinas, see the bibliographical list above.

³Translator's italics.

⁴ The modal status of the Identity of Indiscernibles in Leibniz's philosophy is a much discussed topic, mainly because of the ambiguity on this issue in Leibniz's correspondence with Clarke. For discussion of the modal status of Leibniz' Identity of Indiscernibles see, among others, Russell 2002: 65, Joseph 1949: 19, Parkinson 1965: 134, Rescher 1967: 48, Adams 1979: 11–12, Jauernig 2008: 225, Clatterbaugh (1973: 35). Chernoff (1981) is entirely focused on the issue with respect to the correspondence with Clarke.

⁵ Indeed, assuming that necessarily things that differ in species do not resemble each other perfectly, what Aquinas said entailed what Leibniz attributes to him since Aquinas claimed that it is *impossible* that angels do not differ in species. *Summa Theologiae* pars I, q. 50, art. 4. See also *Sententiarum*, lib. 2 d. 3 q. 1 a. 4 co.

⁶ I have formulated this premise, and premise 2, in terms of the idea of the principle of distinction of the spheres being in other objects, rather than in 'external' objects, which is Leibniz's phrase in the letter. But external objects are other objects and, if by 'other objects' one understands objects that are *entirely* other, i.e. any objects other than the spheres except their parts, all objects other than the spheres are external to them. In this paper I understand 'other objects' as entirely other objects, and this is why my using 'other objects' rather than 'external objects' is not a misrepresentation of Leibniz's argument.